

Wildlife Habitats - California Wildlife Habitat Relationships System

About the CWHR Habitat Classification Scheme

The CWHR habitat classification scheme was developed to provide a systematic method for describing how the constituent stage classes and structures support California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988, the classification scheme had 53 habitats. These habitats, except the non-vegetated Barren habitat, are described in detail in the CWHR publication entitled:

A Guide to Wildlife Habitats of California. 1988.

Edited by Kenneth E. Mayer and William F. Laudenslayer, Jr.
State of California, Resources Agency,
Department of Fish and Game
Sacramento, CA. 166 pp.


The entire original publication is available online with updates (see below).

At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated ([download Habitat Range shapefiles \(.zip\)](#)). Please note: the 59 habitats described below were designed for use with a predictive model for terrestrial vertebrate wildlife species. They do not represent a comprehensive classification scheme for the conservation and mapping of California's terrestrial vegetation* or its marine and estuarine habitats**.

- **Stages** are defined for virtually all habitats. A stage is a combination of size and cover class for tree-dominated habitats, age and cover class for shrub habitats, height and cover class for herb habitats, and depth and substrate for aquatic habitats. A field sampling protocol is well-established for determining stages in all vegetated habitats.
- **Special habitat elements** are also defined. They include live and decadent vegetation elements such as snags, physical elements such as banks and burrows, aquatic elements, vegetative and animal diet elements and human-made elements.

The predictive model for each species has expert-applied suitability ratings for three life-requisites – breeding, cover and feeding. For each species, each habitat stage is rated as high, medium, low or unsuitable for each of these life requirements. Each special habitat element is also assessed as essential, secondarily essential, preferred or not rated for the species.


*** Notes on Classification and Mapping of Terrestrial Vegetation in California**

- Information on classification and mapping of terrestrial vegetation is available from the [Vegetation Classification and Mapping Program \(VegCAMP\)](#), CDFW Biogeographic Data Branch.
- Field sampling for CWHR habitat stages has been incorporated into the California Native Plant Society (CNPS) Rapid Assessment Protocol, to increase the utility of the resulting vegetation maps for wildlife modeling and conservation. Information and links to field forms are available on the [CNPS website](#) .

- Crosswalks to the CWHR habitat classification scheme are included in all of California's major vegetation and land cover mapping efforts.

** Notes on Classification of Marine and Estuarine Habitats in California


- A classification scheme for the conservation and management of marine and estuarine habitats was developed in cooperation with the CWHR Program in 2002. It includes descriptions for 22 marine and 19 estuarine habitats. At present, it does not include suitability ratings to habitat stages or special habitat elements for the terrestrial amphibians, reptiles, birds and mammals currently in the CWHR System.
- The new classification includes crosswalks to other important, recent classifications regarding coastal waters. Included are crosswalks to Wetlands of the Central and Southern California Coast and Coastal Watersheds; a methodology for their classification and description (Ferren et al., 1996), Baylands Ecosystem Habitat Goals: a report of habitat recommendations (U.S. Environmental Protection Agency, 1999), A classification scheme for deep sea floor habitats (Greene et al., 1999), and Wildlife-habitat relationships in Oregon and Washington (Johnson and O'Neil, 2001). Also included are crosswalks to a national scheme for marine and estuarine ecosystems and habitat classification published by the National Oceanic and Atmospheric Administration (NOAA) in 2002 and a classification for habitats of the Channel Islands drafted in 2000 by the Channel Island National Marine Sanctuary (CINMS).

[Revision to Marine and Estuarine Habitats of the California Wildlife Habitat Relationships System \(2002\) \(PDF\)](#) 

A Guide to Wildlife Habitats of California (1988)

Guide Section

Updates

[Contributing Authors, Acknowledgements, and Preface \(PDF\)](#) 

[Introduction and Scope \(PDF\)](#) 

Includes:

- How to Use the Guide
- How to Classify Habitats
- Special Habitat Elements
- Available Habitat Stages

[Revised Classification Rules \(2005\) \(PDF\)](#) 

[Wooded Habitat Sampling Datasheet \(PDF\)](#) 

[Analysis of Wooded Habitat Sampling Data \(PDF\)](#) 

[Non-Wooded Habitat Sampling Datasheet \(PDF\)](#) 

[Analysis of Non-Wooded Habitat Sampling Data \(PDF\)](#) 


[Habitat Element Checklist \(PDF\)](#) 

Guide Section

Updates

[Available Habitat Stages for Agricultural Habitats \(PDF\)](#) 

[Definition of Added Human Element - Mine \(PDF\)](#) 

[Clarification of the Measurement of California Wildlife Habitat Relationships \(CWHR\) System Size Class 5 and 6 for Tree Habitats \(2007\) \(PDF\)](#) 

[Crosswalk Between WHR and California Vegetation Classifications \(PDF\)](#) 


[CWHR Crosswalked with CNPS Vegetation Classification \(2005\) \(PDF\)](#) 

[CWHR Crosswalked with CalVeg Classification \(2005\) \(PDF\)](#) 

[UNESCO Formations Within CWHR \(1998\) \(PDF\)](#) 













[CWHR Crosswalked with DWR Land Use Types \(2008\) \(PDF\)](#) 











































[Literature Cited \(PDF\)](#) 
























[Plants and Animals Referenced in Text \(PDF\)](#) 

Habitat Types













Tree Dominated Habitats

























HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988	Range	Photo
		Text Account	Map	
Subalpine Conifer (SCN)	Engelmann Spruce, Subalpine Fir, Mountain Hemlock			
Red Fir (RFR)	Red Fir, White Fir, Lodgepole Pine			
Lodgepole Pine (LPN)	Lodgepole Pine, Aspen, Mountain Hemlock			
Sierran Mixed Conifer (SMC)	Douglas Fir, Ponderosa Pine, White Fir New! <i>updated description of range</i>			

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988	Range	Photo
		Text Account	Map	
White Fir (WFR)	White Fir, Douglas Fir, Sugar Pine <i>New! corrected range map</i>			
Klamath Mixed Conifer (KMC)	White Fir, Douglas-Fir, Ponderosa Pine <i>New! updated description</i>			
Douglas Fir (DFR)	Douglas Fir, Tanoak, Ponderosa Pine			
Jeffrey Pine (JPN)	Jeffrey Pine, Ponderosa Pine, Sugar Pine			
Ponderosa Pine (PPN)	Ponderosa Pine, Jeffrey Pine, Douglas Fir			
Eastside Pine (EPN)	Ponderosa Pine, Jeffrey Pine, White Fir			
Redwood (RDW)	Redwood, Grand Fir, Sitka Spruce			
Pinyon-Juniper (PJN)	Pinyon Species, Juniper Species, Mountain Mahogany Species			
Juniper (JUN)	Juniper Species, White Fir, Jeffrey Pine			
Aspen (ASP)	Aspen, Willows, Alders			
Closed-Cone Pine-Cypress (CPC)	Sargent Cypress, Monterey Cypress, Monterey Pine			
Montane Hardwood-Conifer (MHC)	Ponderosa Pine, Incense Cedar, California Black Oak			
Montane Hardwood (MHW)	Canyon Live Oak, California Black Oak, Oregon White Oak			
Blue Oak Woodland (BOW)	Blue Oak, Interior Live Oak, California Buckeye			
Valley Oak Woodland (VOW)	Valley Oak, California Walnut, California Sycamore			










HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988		
		Text Account	Range Map	Photo
Coastal Oak Woodland (COW)	Coast Live Oak, Engelmann Oak, Island Oak <i>New! updated description of dominants</i>			
Blue Oak-Foothill Pine (BOP)	Foothill Pine, Blue Oak, Interior Live Oak			
Eucalyptus (EUC)	Blue Gum, Red Gum			
Montane Riparian (MRI)	Black Cottonwood, Bigleaf Maple, White Alder			
Valley Foothill Riparian (VRI)	Cottonwood, Sycamore, Valley Oak			
Desert Riparian (DRI)	Tamarisk, Mesquite, Fremont Cottonwood			
Palm Oasis (POS)	Fan Palm, Velvet Ash, California Sycamore			
Joshua Tree (JST)	Joshua Tree, Juniper Species, Mojave Yucca			










Shrub Dominated Habitats

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988		
		Text Account	Range Map	Photo
Alpine Dwarf-Shrub (ADS)	Oceanspray, Greene Goldenweed, Mountain Heather			
Low Sage (LSG)	Low Sagebrush, Black Sagebrush, Rabbitbrush Species			
Bitterbrush (BBR)	Bitterbrush Species, Big Sagebrush, Rubber Rabbitbrush			
Sagebrush (SGB)	Sagebrush Species, Rabbitbrush Species, Horsebrush			

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988	Range	Photo
		Text Account	Map	
Montane Chaparral (MCP)	Ceanothus Species, Manzanita Species, Bitter Cherry			
Mixed Chaparral (MCH)	Scrub Oak, Ceanothus Species, Manzanita Species			
Chamise-Redshank Chaparral (CRC)	Chamise, Redshank, Ceanothus Species			
Coastal Scrub (CSC)	Coyotebush, California Buckwheat, Sage Species			
Desert Succulent Shrub (DSS)	Octillo, Mojave Yucca, Desert Agave			
Desert Wash (DSW)	Paloverde Species, Desert Ironwood, Mesquite			
Desert Scrub (DSC)	Creosotebush, Catclaw Acacia, Desert Agave			
Alkali Desert Scrub (ASC)	Allscale, Saltbush Species, Shadscale			





Herbaceous Dominated Habitats

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988	Range	Photo
		Text Account	Map	
Annual Grassland (AGS)	Wild Oats, Soft Chess, Brome Species <i>New! updated range map and description of range</i>			
Perennial Grassland (PGS)	California Oatgrass, Hairgrass, Sweet Vernalgrass <i>New! updated range map and description of range</i>			
Wet Meadow (WTM)	Sedge Species, Rush Species, Tufted Hairgrass			








HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988 Text Account	Range Map	Photo
Fresh Emergent Wetland (FEW)	Cattail, Bulrush, Redroot Nutgrass			
Saline Emergent Wetland (SEW)	Cordgrass, Pickleweed, Bulrush			
Pasture (PAS)	Bermuda Grass, Ryegrass, Tall Fescue			

























Aquatic Habitats

See also: "[Notes on Classification of Marine and Estuarine Habitats](#)"

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988 Text Account	Range Map	Photo
Riverine (RIV)	Water Moss, Algae, Duckweed			
Lacustrine (LAC)	Plankton, Duckweed, Water Lilies			
Estuarine (EST)	Plankton, Algae, Eel Grass			
Marine (MAR)	Plankton, Algae, Kelp			

Developed Habitats

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988 Text Account	Range Map	Photo
Cropland (CRP)	Tomatoes, Corn, Wheat <i>** Replaced by DGR, IGR, IRH, IRF, RIC **</i>			
Dryland Grain Crops (DGR)	Cereal Rye, Barley, Wheat			
Irrigated Grain Crops (IGR)	Corn, Dry Beans, Safflower			

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988	Range	Photo
		Text Account	Map	
Irrigated Hayfield (IRH)	Alfalfa, Hay			
Irrigated Row and Field Crops (IRF)	Tomatoes, Cotton, Lettuce			
Rice (RIC)	Rice			
Orchard - Vineyard (OVN)	Apples, Oranges, Grapes <i>** Replaced by DOR, EOR, VIN **</i>			
Deciduous Orchard (DOR)	Almonds, Walnuts, Peaches			
Evergreen Orchard (EOR)	Oranges, Avocados, Lemons			
Vineyard (VIN)	Grapes, Kiwi Fruit, Boysenberries			
Urban (URB)	Grass Lawns, Ornamental Trees, Hedges			

Non-vegetated Habitats

HABITAT TYPE	PRIMARY SPECIES REFERENCED IN TEXT	1988	Range	Photo
		Text Account	Map	
Barren (BAR)	Rock, Gravel, Soil			 

CWHR

- [Life History Accounts and Range Maps](#)
- [Guide to Wildlife Habitats of California](#)
- [FAQ](#)

