## CROSSWALK BETWEEN WHR AND CALIFORNIA VEGETATION CLASSIFICATIONS

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#### INTRODUCTION

A number of classification systems have been developed for California vegetation. Each of these is unique in structure and purpose. Based on the level of specificity desired for research and management application, it is often desirable to compare, or cross-reference, vegetative descriptions of various classifications. This crosswalk is designed to assist the user in cross-referencing the habitats contained within this Guide to the other widely used vegetations classification systems. Crosswalk users can determine how a particular WHR habitat might be defined by other classifications. Simply compare the WHR habitat in the left-hand column with its corresponding cross-reference(s) from the columns at the top of the page.

Vegetation classification systems incorporated into the crosswalk are:

Cheatham and Haller's (1975) California vegetation and classification system;

CNDDB/Holland (1986), the recent revision of Cheatham and Haller by the California Natural Diversity Data Base;

Cowardin (1979), a U.S. Fish and Wildlife Service classification for wetlands;

Eyre (1980), the Society of American Foresters' forest cover type system;

Kuchler's (1977) natural vegetation types;

Parker and Matyas (1979, 1980), the U.S. Forest Service CALVEG classification;

Paysen et al. (1980), a U.S. Forest Service system applied to southern California;

Proctor et al. (1980), a U.S. Fish and Wildlife Service system for the Pacific Northwest Coast; and

Thorne's (1976) plant communities system.

Barbour and Major (1977) contains excellent descriptions and valuable information on California vegetation. However, it deliberately avoids presenting a vegetation classification system and is therefore not included in this crosswalk.

#### METHODS

We derived the crosswalk from unpublished WHR Standards and guidelines and from the Other Classifications sections of each WHR habitat description. We also compared WHR descriptions

of distribution, and vegetation structure and composition with the vegetation type descriptions of each of the other vegetation classification systems. A WHR type and another vegetation type corresponded if structure and composition descriptions had a majority of elements in common, and the distribution description had at least one location in common. This included three situations:

- 1. The WHR type was completely included in the vegetation type.
- 2. The vegetation type was completely included in the WHR type.
- 3. The WHR type and the vegetation type overlapped (i.e., met criteria for correspondence described above), but neither type completely included the other.

Presence of a particular plant species in both a WHR habitat and a vegetation type from another classification system did not necessarily constitute overlap. For example, grass species in WHR's Annual Grassland (AGS) are dominant in the understory in Cheatham and Haller's Oak Woodlands (7.1), but the two types do not have a majority of structure and composition elements in common, and thus the crosswalk shows that they do not correspond.

For vegetation systems using a hierarchical classification, we used the highest hierarchical level possible in presenting the corresponding vegetation types. For example, WHR's Alpine Dwarf Scrub (ADS) corresponds to all four of Cheatham and Haller's minor subdivisions in the major subdivision Alpine Fell-fields (9.11), thus Alpine Fell-fields is used in the crosswalk. WHR's Low Sage (LSG) corresponds to only one minor subdivision of the major subdivision Sagebrush Scrub (3.31), consequently the minor subdivision Subalpine Scrub (3.312) is used in the crosswalk.

Because we used the highest hierarchical level possible, occasionally one WHR type corresponded to an entire subdivision, while another WHR type may have corresponded to only a portion of that subdivision. For example, Sub-alpine Conifer (SCN) corresponded to all of Cheatham and Haller's Subalpine Coniferous Forests (8.6), while Lodgepole Pine (LPN) corresponded only to portions of that habitat—Lodgepole Pine Forest (8.61) and Whitebark Pine-Lodgepole Pine Forest (8.622).

Some Parker and Matyas (1981) vegetation series descriptions differed significantly among their ecological provinces. As a result, sometimes a WHR type corresponded to a series in only a portion of the ecological provinces for which it was described. This situation is indicated by a list of the corresponding province acronym(s) in parentheses following the series name.

In certain instances, correspondence often could not be determined. This was especially true if the scope or complexity of the WHR type and the classification system differed. We used "not applicable" when the classification system had either regional or ecological limitations (e.g. southern California or wetland classification systems) and "no corresponding vegetation type" if we could find no appropriate correspondence.

## **CAVEAT FOR USERS**

Users should note that a WHR habitat and a corresponding vegetation type in the Crosswalk are not necessarily equivalent. For example, the Crosswalk shows WHR's Coastal Scrub (CSC) corresponding with Munz and Keck's Coastal Strand, but the two are not equivalent because the WHR type is broader. In fact, it encompasses two other Munz and Keck types, Northern Coastal Scrub and Coastal Sage Scrub. In contrast, the WHR habitat description is sometimes narrower than a corresponding type in another classification system. Consider WHR's Chamise-Redshank Chaparral (CRC) which corresponds with, but is not equivalent to, Munz and Keck's Chaparral. Munz and Keck's Chaparral also encompasses WHR's Mixed Chaparral (MCH) and Montane Chaparral (MCD). The crosswalk's format emphasizes that a WHR type can correspond to more than one vegetation type of another classification system. It is important for users to understand that the converse can also be true.

#### ACKNOWLEDGMENTS

We thank the individual authors of the WHR habitat descriptions, all of whom reviewed portions of the Crosswalk relevant to their chapters. We also thank Robert F. Holland, who graciously prepared the correspondences of CNDDB types with WHR habitats.

# Table 6. Crosswalk showing correspondence between Wildlife Habitat Relationships habitats and vegetation types of selected California vegetation classification systems. Trace Dominated Habitate

**Tree Dominated Habitats** 

	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
SUB-ALPINE CONIFER (SCN)	Subalpine Conif- erous Forests (8.6)	Sierran Mixed Subalpine Conif- erous Forest (86200) Foxtail Pine Forest (86300) Bristlecone Pine Forest (86400) Southern Califor- nia Subalpine Forest (86500) Whitebark Pine Forest (86600) Limber Pine Forest (86700)	Mountain Hemlock (205) Englemann Spruce— Subalpine Fir (206) Whitebark Pine (208) Bristlecone Pine (209) Western White Pine (215) Limber Pine (219) California Mixed Subalpine (256)	Upper Montane— Subalpine Forests (17) Southern Montane Subalpine Forest (18) Great Basin Sub- alpine Forest (19)	Subalpine Forest (17) Bristle-cone Pine Forest (18)	Bristlecone Pine Englemann Spruce—Alpine Fir Foxtail Pine Limber Pine Lodgepole Pine Mountain Hemlock Western White Pine Whitebark Pine	Bristlecone Pine Limber Pine	True Fir Zone: Second Growth Forest (1.1.2 E) True Fir Zone: Old Growth Forest (1.1.2 F)	Subalpine conifer- ous forest (14c) Bristlecone pine woodland (18a)
RED FIR (RFR)	Red Fir Forest (8.531)	Red Fir Forest (85310)	Red Fir (207)	Coast Range Mon- tane Forest (14) Upper Montane— Subalpine Forests (17)	Red Fir Forest (15)	Red Fir Fed Fir—Noble Fir	no corresponding vegetation type	no corresponding vegetation type	Red fir forest (14b2)
LODGEPOLE PINE (LPN)	Lodgepole Pine Forest (8.61) Whitebark Pine	Lodgepole Pine Forest (86100) Whitebark Pine— Lodgepole Pine Forest (86220)	Lodgepole Pine (218)	Upper Montane— Subalpine Forests (17) Southern Montane Subalpine Forest (18)	Lodgepole Forest (16)	Lodgepole Pine	Lodgepole Pine	no corresponding vegetation type	Lodgepole pine forest (14c1)
SIERRAN MIXED CONIFER (SMC)	Sierran Mixed Conifer Forest (8.423) Sierra Big Tree Forest (8.425)	Ultramafic White Pine Forest (84160) Ultramafic Mixed Coniferous Forest (84180) Sierran Mixed Coniferous Forest (84230) Big Tree Forest (84250)	Sierra Nevada Mixed Conifer (243) Pacific Ponderosa Pine—Douglas-fir (244)	Sierran (14)		Big Tree Jeffrey Pine (NCM, Yellow Pine NI, NS) Forest Mixed Conifer—Fir Mixed Conifer— Pine (NMC, NI, NS, SS) Ponderosa Pine (NI, SS)	Mixed Conifer	not applicable	Yellow Pine forest (14a2) Mixed conifer forest (14a3)

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	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)		Proctor et al. (1980)	Thorne (1976)
WHITE FIR (WFR)	Sierran White Fir Forest (8.424)	Ultramafic White Pine Forest (84160)	White Fir (211)	Coast Range Mon- tane Forest (14)	Yellow Pine Forest (14)	Mixed Conifer—Fir	White Fir	no corresponding vegetation type	White fir—sugar pine (14b1)
	Southern Califor- nia White Fir Forest (8.532)	Sierran White Fir Forest (84240)		Sierran Montane Forest (15)		White Fir			White fir (18b)
		Southern Califor- nia White Fir Forest (85320)		Forest (16)					
		Desert Mountain White Fir Forest (85330)							
KLAMATH- MIXED CONIFER (KMC)	Klamath Enriched Conifer Forest (8.54)	Ultramafic White Pine Forest (84160)	Pacific Douglas-fir (229)	Klamath Montane Forest with Dou- glas Fir (12)	Yellow Pine Forest (14)	Mixed Conifer— Klamath Enriched	not applicable	True Fir Zone: Growth Forest (1.1.2 E)	Enriched conifer forest (14b3)
1		Ultramafic Mixed Coniferous Forest (84180)		Klamath Montane Forest with Yellow Pine (13)	Red Fir Forest (15)	Mixed Conifer— Pine (NCM, NI)		True Fir Zone: Old Growth Forest (1.1.2 F)	
		Klamath Enriched Coniferous Forest (55400)	,	Coast Range Mon- tane Forest (14)				Mixed Evergreen Zone: Serpentine (1.2.3 E)	
								Mixed Evergreen Zone: Second Growth Forest (Conifer) (1.2.3 J)	
								Mixed Evergreen Zone: Old Growth Forest (1.2.3 K)	
DOUGLAS-FIR (DFR)	Western Hemlock Forest (8.22)	Tanoak Forest (81400)	Pacific Douglas-fir (229)	Mixed Evergreen Forest with Chin-	Douglas-Fir Forest (13)	Douglas Fir	no corresponding vegetation type	Redwood Zone: Second Growth	Douglas-fir forest (10e)
,	Douglas-fir Forest (8.24)	Mixed North Slope Forest (81500)	Douglas-fir— Western Hemlock	duapin (21) Mixed Everygreen	Mixed Evergreen Forest (19)	Pine Madrone		(1.2.2 l)	Northern mixed evergreen forest
		Sitka Spruce Grand Fir Forest (82100)	(230) Port Orford-Cedar (231)	dodendron (22)		Douglas Fir— Tanoak— Madrone		Second Growth Forest (Conifer) (1.2.2 J)	(חטר) י
		Western Hemlock Forest (82200)	Douglas-fir— Tanoak—Pacific Madrona (224)					Redwood Zone: Old Growth Forest	
		Douglas-fir Forest (82400)	Madrone (204)					Mixed Evergreen	
	Ţ	Port-Orford-cedar Forest (82500)						Zone: Second Growth Forest (Broadleaf) (1.2.3 H)	

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al (1980)	Thorne (1976)
DOUGLAS-FIR (continued)								Mixed Evergreen Zone: Second Growth Forest (Mixed) (1.2.3 l)	
								Mixed Evergreen Zone: Second Growth Forest (Conifer) (1.2.3 J)	
								Mixed Evergreen Zone: Old Growth Forest (1.2.3 K)	
								Sitka Spruce Zone: Second Growth Forest (Mixed) (1.2.4 I)	
JEFFREY PINE (JPN)	Jeffrey Pine (8.51)	Northern Ultra- mafic Jeffrey Pine	Jeffrey Pine (247)	Northern Jeffrey Pine Forest (3)	Yellow Pine Forest (14)	Jeffrey Pine	Ponderosa/Jeffrey Pine	Mixed Evergreen Zone: Serpentine	Yellow pine forest (14a2)
	Upper Montane Mixed Conifer	Forest (84171)		Southern Jeffrey	Red Fir Forest (15)		1	(1.2.3 E)	
	Forest (8.52)	Southern Ultra- mafic Jeffrey Pine Forest (84172)		Pine Forest (4)	1				
		Jeffrey Pine Forest (85100)							
		Jeffrey Pine—Fir Forest (85210)							
PONDEROSA PINE (PPN)	Coast Range Pon- derosa Pine Forest (8.413)	Coast Range Pon- derosa Pine Forest (84130)	Sierra Nevada Mixed Conifer (243)	Northern Yellow Pine Forest (5)	Yellow Pine Forest (14)	Ponderosa Pine Mixed Conifer-	Ponderosa/Jeffrey Pine	no corresponding vegetation type	Yellow Pine forest (14a2)
	"Westside" Pon-	Ultramafic White	Pacific Ponderosa	Southern Yellow Pine Forest (6)		Pine (NCM, NI, NS, SS)			
	derosa Pine Forest (8.421)	Pine Forest (84160)	Pine—Douglas-fir (244)	Sierran Yellow	1				
	"Eastside" Ponde- rosa Pine Forest (8,422)	Westside Ponde- rosa Pine Forest (84210)	Pacific Ponderosa Pine (245)	Yellow Pine— Shrub Forest (8)					
	(0.122)	Eastside Ponde- rosa Pine Forest (84220)		Klamath Montane Forest with Yellow Pine (13)					
	·		<u> </u>	Coast Range Mon- tane Forest (14)					

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WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
EASTSIDE PINE (EPN)	"Eastside" Ponde- rosa Pine Forest (8 422)	Eastside Ponde- rosa Pine Forest (84220)	Interior Ponderosa Pine (237)	Yellow Pine— Shrub Forest (8)	Yellow Pine Forest (14)	Ponderosa Pine (NI, NS)	Ponderosa/Jeffrey Pine	not applicable	Yellow pine forest (14a2)
	(0.422)	Jeffrey Pine Forest (85100)							Washoe Pine forest (18c)
	T.	Washoe Pine—Fir Forest (85220)							
REDWOOD (RDW)	Redwood Forest (8.23)	North Coast Alluv ial Redwood Forest (61120)	Redwood (232)	Redwood Forest (2)	Redwood Forest (12)	Redwood Redwood—	Coast Redwood	Redwood Zone: Early Seral Shrub (1.2.2 G)	Redwood forest (10d)
		Upland Redwood Forest (82320)		Mixed Hardwood and Redwood Forest (24)		Douglas Fir		Redwood Zone: Second Growth Forest (Conifer) (1.2.2 J)	
								Redwood Zone: Old Growth Forest (Conifer) (1.2.2 K)	
PINYON JUNIPER (PJN)	Pinyon–Juniper Woodland (7.2)	Great Basin Pinyon—Juniper Woodland (72121)	Pinyon—Juniper (239)	Juniper—Pinyon Woodland (11)	Pinyon—Juniper Woodland (28)	Singleleaf Pinyon Singleleaf Binyon Utab	Pinyon Pine	not applicable	Pinyon—juniper woodland (18d2)
		Great Basin Pinyon Woodland (72122)				Juniper			
		Mojavean Pinyon Woodland (72210)							
		Penisular Pinyon Woodland (72310)							
JUNIPER (JUN)	Northern Juniper Woodland (7.211)	Juniper—Oak Cismontane Woodland (71430)	Western Juniper (238)	Juniper Savanna (34)	Northern Juniper Woodland (27)	Juniper Western Juniper	Western Juniper Juniper	not applicable	Mountain juniper woodland (14b4)
		Northern Juniper Woodland (72110)		Juniper Shrub Savanna (35)			, ·		Northern juniper woodland (18d1)
		Great Basin Juniper Woodland and Scrub (72123)							
		Mojavean Juniper Woodland and Scrub (72220)							

#### **Tree Dominated Habitats**

		Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
JUNIPE (continu	R led)		Cismontane Juniper Woodland and Scrub (72400)							
ASPEN (ASP)		Aspen Groves (6.23)	Aspen Ripariar Forest (61520)	Aspen (217)	no corresponding vegetation type	no corresponding vegetation type	Quaking Aspen	Aspen	no corresponding type	Aspen woodland
			Aspen Forest (81B00)							
	O-CONE	Closed-cone Coniferous Forest	Closed-cone Coniferous Forest	Knobcone Pine	Coastal Cypress	Closed-cone Pine	Bishop Pine	Bishop Pine	no corresponding	Closed-cone conifer-woodland
(CPC)		(8.3)	(83000)	(210)	(9)	1 Orost	Cuyamaca	Cypress	i ogo anon i jpo	(9)
							Gowen Cypress	Knobcone Pine		Shore pine wood- land (10a)
							Knobcone Pine	Monterey Pine		Torrev pine wood-
							MacNab Cypress	Torrey Pine		land (10b)
							Modoc Cypress			
							Monterey Cypress			
							Monterey Pine			
							Plute Cypress			
							Pygmy Cypress			
							Cypress			
							Sargent Cypress			
							Tecate Cypress			
							Torrey Pine			
MONTA	NE 100D	Mixed Evergreen Forest (8.11)	Mixed Evergreen Forest (81100)	Oregon White Oak (233)	Oregon Oak Forest (20)	Douglas-fir Forest (13)	Big-cone Douglas Fir	Big-cone Douglas-fir	Redwood Zone: Second Growth	Redwood forest (10d)
(MHC)	:к	Coast Range	California Bay	Douglas-fir— Tanoak—Pacific	Mixed Evergreen	Mixed Evergreen	Black Oak (NCM,	Black Oak	(1.2.2 H)	Douglas-fir forest
		Forest (8.411)	Coast Bange	Mandrone (234)	quapin (21)	101651(13)	Coulter Bine	Coulter Pine	Redwood Zone:	
		Santa Lucia Fir	Mixed Coniferous	California Black	Mixed Evergreen		Dourdas	Digger Pine	Forest (Mixed)	forest (10f)
		Coast Bange Pon-	Santa Lucia Fir	Knobcone Pine	dodendron (22)		Fir—Pine— Madrone	Madrone	(1.2.2.1) Mixed Evergroop	Lower montane
		derosa Pine	Forest (84120)	(248)	Mixed Hardwood Forest (23)		Douglas Fir-	Santa Lucia Fir	Zone: Second	(14a)
		Coulter Pine Forest (8,414)	Coulter Pine Forest (84140)	Canyon Live Oak (249)	Mixed Hardwood		Tanoak— Madrone		(Broadleaf) (1.2.3 H)	

	Cheatham and Haller (1975)		Eyre (1980)		Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
MONTANE HARDWOOD (Continued)		Bigcone Spruce— Canyon Oak Forest (84150)	<u>.</u>	Forest (24) Coulter Pine Forest (26)		Madrone—Tanoak (CCM) Mixed Conifer- Pine (SS) Santa Lucia Fir		Mixed Evergreen Zone: Second Growth Forest (Mixed) (1.2.3 I) Mixed Evergreen Zone: Second Growth Forest	
MONTANE HARDWOOD (MHW)	Northern Oak Woodland (7.11) Canyon Live Oak Forest (8.132)	Oregon Oak Woodland (71110) Black Oak Wood- land (71120) Interior Live Oak Woodland (71150) Mixed North Slope Cismontane Woodland (71420) Canyon Live Oak Forest (81320) Interior Live Oak Forest (81330) Black Oak Forest (81340)	California Black Oak (246) Canyon Live Oak (249)	Mixed Evergreen Forest with Chin- quapin (21) Mixed Evergreen Forest with Rho- dodendron (22) Mixed Hardwood Forest (23)	Mixed Evergreen Forest (19) Northern Oak Woodland (20) Southern Oak Woodland (21) Foothill Woodland (22)	Black Oak California Bay Canyon Live Oak Madrone—Black Oak Madrone— Tanoak Tanoak— Madrone	Black Oak Canyon Live Oak Madrone Tanoak	(Conifer) (1.2.3 J) Redwood Zone: Second Growth Forest (Broadleaf) (1.2.2 H) Mixed Evergreen Zone: Second Growth Forest (Broadleaf) (1.2.3 H)	Northern mixed evergreen forest (10f1)
BLUE OAK WOODLAND (BOW)	Blue Oak Wood- land (7.121)	Blue Oak Wood- land (71140) Interior Live Oak Woodland (71150) Alvord Oak Wood- land (71170) Interior Live Oak Forest (81330)	Blue Oak—Digger Pine (250)	Blue Oak—Digger Pine Forest (25)	Foothill Woodland (22)	Blue Oak (NCM, NS, SS, CV) Blue Oak—Digger Pine	Blue Oak	not applicable	Foothill woodland (12b)
VALLEY OAK WOODLAND (VOW)	Central Valley Bot- tomland Woodland (6.11) Valley Oak Wood- land (7.122)	Great Valley Valley Oak Riparian Forest (61430) Valley Oak Wood- land (71130)	no corresponding vegetation type	Riparian Forest (28) Valley Oak Savanna (33)	Foothill Woodland (22)	Valley Oak (NCM, CV, CCM, SCM)	Valley Oak	not applicable	Foothill woodland (12b)

	WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
	COASTAL OAK WOODLAND (COW)	Northern Oak Woodland (7.11) Southern Oak Woodland (7.13) Coast Live Oak Forest (8.131)	Central Coast Live Oak Riparian Forest (61220) Coast Live Oak Woodland (71160) Englemann Oak Woodland (71180)	Oregon White Oak (233) California Coast Live Oak (255)	Oregon Oak Forest (20) Mixed Hardwood Forest (23) Southern Oak Forest (27)	Northern Oak Woodland (20) Southern Oak Woodland (21) Foothill Woodland (22)	Black Oak (NCM) Canyon Live Oak (NCM, CCM) Coast Live Oak Engelmann Oak	Coast Live Oak Engelmann Oak	Redwood Zone: Second Growth Forest (Broadleat (1.2.2 H)	Oak woodland (12)
29			Island Oak Wood- land (71190) Walnut Woodland (71200) Coast Live Oak Forest (81310) California Walnut Forest (81600) Island Ironwood Forest (81700)* Cherry Forest (81800)*				(NCM)			
	BLUE OAK- DIGGER PINE (BOP)	Blue Oak Wood- land (7.121)	Digger Pine Wood- land (71300) Digger Pine—Oak Woodland (71410)	Blue Oak-Digger Pine (250)	Blue Oak—Digger Pine Forest (25)	Foothill Woodiand (22)	Blue Oak—Digger Pine Blue Oak (NS, SS) Interior Live Oak (NCM, NS, SS, CCM)	Blue Oak Digger Pine	not applicable	Foothill woodland (12b)
	EUCALYPTUS (EUC)	no corresponding vetetation type	no corresponding vegetation type	no corresponding vegetation type	no corresponding vegetation type	no corresponding vegetation type	Eucalyptus	Eucalyptus	not applicable	no corresponding vegetation type
	MONTANE RIPARIAN (MRI)	Mixed Riparian Woodlands (6.21) Red Alder Groves (6.22) Willow Thickets (6.24)	Montane Ripar- Pal ian Forest ste (61500) Bro De Montane Ripar- ian Scrub (63500)	ustrine: Fore- adleaved Blac ciduous Cott Will Cott	Alder (221) Ripari (28) k (28) onwood— ow (222) ionwood— ow (235)	an Forest no corr ing veg type	espond- etation Bigleaf M Black Cottonw NS, SS, SCM) Cottonw Alder	Alder Maple Bigleaf ood Californ ood (NI, CCM, Willow	Redwood Riparian (1 D) hia Bay wood (12.3 D) Sitka Spr. Zone: Rip (12.4 D)	Zone: Riparian wood- 1.2.2. land (7) argreen arian Ince arian

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Cowardin (1979)	Eyre (1980)	Kuchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
MONTANE RIPARIAN (Continued)							Maple—Alder— Dogwood Maple—Dog- wood Red Alder White Alder Willow Willow—Alder	-	Sitka Spruce Zone: Second Growth Forest (Broadleaf) (1.2.4 H) Sitka Spruce Zone: Second Growth Forest (Mixed) (1.2.4 I)	
VALLEY FOOT- HILL RIPARIAN (VRI)	Central Valley Bottomland Woodland Forest (6.11) Northern Ripar- ian Woodland (6.212) Southern Ripar- ian Woodland (6.212) Southern Alluvial Woodlands (6.31= 7.41)	Freshwater Swamp (52600) North Coast Riparian Forest (61100) Central Coast Riparian Forest (61200) Southern Ripar- ian Forest (61300) Great Valley Riparian Forest (61400) Sycamore Alluv- ial Woodland (62100) Southern Sycamore— Alder Riparian Woodland (62400) North Coast Riparian Scrub (63100) Southern Ripar- ian Scrub (63300) Great Valley Riparian Scrub (63400)	Palustrine: Fore- sted Wetland: Broad-leaved Deciduous	Cottonwood— Willow (235)	Riparian Forest (28)	no correspond- ing vegetation type	Black Cotton- wood (CCM) California Sycamore Cottonwood (NI, NS, SS, CV, CCM, SCM)	Alder Cottonwood Sycamore Wild Rose Willow	no correspond- ing vegetation type	Riparian wood- land (7)

Table 6 (co	ntinued)			Tree D	ominated H	labitats				
WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Cowardin (1979)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
DESERT RIPARIAN (DRI)	Colorado River Bottomland Wood- land (6.12) Desert Dry Wash Woodland (6.32=7.42)	Modoc—Great Basin Riparian Forest (61600) Mojave Riparian Forest (61700) Colorado Riparian Forest (61800) Desert Dry Wash Woodland (62200) Modoc—Great Basin Riparian Scrub (63600) Mojave Desert Wash Scrub (63700) Colorado Riparian Scrub (63800)	Palustrine: Fore- sted Wetland: Broad-leaved Deciduous	Cottonwood— Willow (235) Mesquite (242)	Alkali Scrub— Woodland (48)	no corresponding vegetation type	Arrowweed Cottonwood (SI) Mesquite Tamarisk	Arrowweed Cottonwood Mesquite Sait-cedar Willow	, not applicable	Desert microphyll woodland (20g) Desert riparian woodland (20i)
PALM OASIS (POS)	Palm Oasis Wood- land (6.4)	Desert Fan Palm Oasis Woodland (62300)	Palustrine: Fore- sted Wetland: Broad-leaved Evergreen	no corresponding vegetation type	Oasis Scrub— Woodland (49)	no corresponding vegetation type	Palm	Palm	not applicable	Desert oasis woodland (20h)
JOSHUA TREE (JST)	Joshua Tree Woodland (7.3)	Joshua Tree Woodland (73000)	not applicable	no corresponding vegetation type	Joshua Tree Scrub (40)	Joshua Tree Woodland (29)	Joshua Tree	Joshua Tree	not applicable	Joshua Tree Woodland (20a)

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
ALPINE DWARF SCRUB	Alpine Fell-fields (9.11)	Alpine Fell-field (91100)	no corresponding vegetation type	Alpine Communi- ties (39)	Alpine Fell-fields (26)	Cushion Plant	Buckwheat	Tundra/Alpine (1.112)	Alpine fell-fields (17)
(ADS)		Alpine Dwarf Scrub (94000)						'	
LOW SAGE (LSG)	Subalpine Sage- brush (3.312)	Subalpine Sage- brush Scrub	no corresponding vegetation type	Sagebrush Steppe (31)	Sagebrush Scrub (6)	Low Sagebrush	Sagebrush	not applicable	Mountain sage- brush scrub (19c)

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al (1980)	Thorne (1976)
BITTERBRUSH (BBR)	Sagebrush Scrub (3.31)	Great Basin Mixed Scrub (35100) Big Sagebrush Scrub (35210) Rabbitbrush Scrub (35400) Shadscale Scrub (36140)	no corresponding vegetation type	Sagebrush Steppe (31) Juniper Shrub Savanna (35)	Sagebrush Scrub (6)	Bitterbrush Bitterbrush— Rabbitbrush Curlleaf Mountain Mahogany Rabbitbrush	Rabbitbrush	no corresponding vegetation type	Great Basin sage- brush scrub (19a)
SAGEBRUSH (SGB)	Great Basin Sage- brush (3.311) <i>Wyethia</i> Meadow—Scrub (3.34=4.53)	Blackbrush Scrub (34300) Great Basin Mixed Scrub (35100) Big Sagebrush Scrub (35210) Sagebrush Steppe (35300) Rabbitbrush Scrub (35400) Great Basin Juniper Woodland and Scrub (72123)	no corresponding vegetation type	Sagebrush Steppe (31) Juniper Shrub Savanna (35)	Sagebrush Scrub (6)	Basin Sagebrush Blackbush Sagebrush Mule Ears	Rabbitbrush	not applicable	Great Basin sage- brush scrub (19a)
MONTANE CHAPARRAL (MCP)	Montane Chappar- ral (3.75)	Montane Chapar- ral (37500) Montane Dwarf Scrub (38000)	no corresponding vegetation type	Chaparral (29)	Chaparral (23)	Bush Chinquapin Greenleaf Manzanita Greenleaf Manzanita—Shrub Black Oak Huckleberry Oak Huckleberry Oak Huckleberry Oak—Pine Mat Manzanita Montane Mixed Shrub Tobacco Brush	no corresponding vegetation type	Mixed Evergreen Zone: Early Seral Shrub (1.2.3 G)	Montane chapar- ral (13f)
MIXED CHAPARRAL (MCH)	Mixed Chaparral (3.71) Semi-Desert Chaparral (3.74)	Upper Sonoran Mixed Chaparral (37100) Semi-Desert Chaparral (3740	no corresponding vegetation type	Chaparral (29) Island Chaparral (30)	Chaparral (23)	Brewer Oak— Mountain Mahogony Ceanothus	Ceanothus Manzanita Mountain Mahogany	Mixed Evergreen Zone: Serpentine (1.2.3 E)	Mixed chaparral (13a) Serpentine chap- arral (13)

Table 6 (continued)				Shrub Dominated Habitats					
WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
MIXED	Serpentine Chap- arral (3.76)	Serpentine Chap-				Common Manzanita	Prunus		Island chaparral (13c)
(continued)	Island Chaparral	Inland Chaparral				Deerbrush	Scrub Oak		Desert transition
	(3.77)	(37700)				Hoary Manzanita	Sumac		chapanar (109)
		Upper Sonoran				Manzanita	Toyon		
		arral (37800)				Mariposa Manzanita			
		Scrub Oak Chap- arral (37900)				Mixed Chaparral			
		Interior Live Oak				Scrub Oak			
		Upper Sonoran				Wedgeleaf Ceanothus			
		Manzanita Chap- arral (37B00)				Whiteleaf Manzanita			
		Maritime Chapar- ral (37C00)				Whiteleaf Manzanita—			
		ione Chaparral (37D00)				Toyon			
		Mesic North Slope Chaparral (37E00)							
		Poison-oak Chap- arral (37 F00)							
		Coastal Sage— Chaparral Scrub (37G00)							
		Alluvial Fan Chap- arral (37H00)							
		Flannel Bush Chaparral (37J00)							
		Upper Sonoran Subshrub Scrub (39000)							
		Digger Pine— Chaparral Wood- land (71320)							
		Island Ironwood Forest (81700)1							
		Silk-tassel Forest (81900) <sup>1</sup>							

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)	
CHAMISE— REDSHANK	Mixed Chaparral	Chamise Chapar-	no corresponding vegetation type	Chaparral (29)	Chaparral (23)	Ceanothus	Chamise	no corresponding	Chamise (13d)	
CHAPARRAL	Chamise Chanar-	Red Shank Chan-	regeneer gpc			Chamise	Redshank	regenerer (pre	Red-shanks	
(CRC)	ral (3.72)	arral (37300)				Red Shanks			chaparrar (156)	
	Red Shank Chap- arral (3.73)									
COASTAL SCRUB (CSC)	Coastal Dune Scrub (2.22)	Backdune Scrub (21300)	no corresponding Coastal Sage- Co vegetation type brush (32)	Coastal Strand (1)	Buckwheat	Baccharis	Redwood Zone: Early Seral Shrub	Coastal scrub (8)		
	Coastal Bluff Scrub (3.1)	Coastal Bluff Scrub (31000)		Northern Sea-	Northern Coastal Scrub (4)	California Sagebrush	California Buckwheat	(1.2.2 G)		
	Coastal Scrub (3.9)	Coastal Scrub		munities/Northern	Coastal Sage	Coyote Brush	Coastal			
	Maritima Castus	(32000)		dune scrub (50, part)	Scrub (5)	Encelia	Sageorusn			
	Scrub (3.51=3.24)	Coastal Sage-		Southern Sea-		Lupine	Encella			
		(37G00)		shore Communi- ties/Dune scrub		Ragweed	Lupine			
		Alluvial Fan Chap-		(51, part)		Sage	Opuntia Salvia			
		arral (37H00)1		Coastal Prairie-		Salal				
				Coastal scrub (52, part)		Sumac				
DESERT	Desert Cactus	Sonaran Mixed	no corresponding	Cactus Scrub (44)	Creosote Bush	Cholla	Agave	not applicable	Stem-succulent	
SHRUB	00100 (0.02)	culent Scrub	vegetation type		Scrub (8)	Ocotillo	Ocotillo		Scrub (20e)	
(055)		(33220)					Opuntia		scrub (20f)	
		Mojave Mixed Woody and Suc- culent Scrub (34240)								
DESERT WASH	Desert Dry Wash	Desert Dry Wash	ish Desert Dry Wash Me	Mesquite	Alkali Scrub-	Creosole Bush	Arrowweed	Catclaw	not applicable	Desert microphyll
(694)	(6.32=7.42)	Woodanio (62200)		woodiand (46)	SCIUD (8)	Catclaw	Desert Ironwood		woodland (20g)	
	Basin Riparian Smoke Tree—	Smoke Tree-	Salt-cedar							
		Scrub (63600)				Desert Willow	Smoke Tree			
		Mojave Desert Wash Scrub (63700)								
DESERT SCRUB	Partially Stabilized and Stabilized	Stabilized and Par- tially Stabilized	no corresponding	Mojave Creosote Bush (41)	Creosote Bush Scrub (8)	Buckwheat	Ambrosia	nbrosia not applicable oldenia reosote Bush	Blackbush scrub	
<i>i</i>	Desert Dunes (2.3)	Desert Dunes	- alement the	Sonoran Creosote	earge (a)	Creosote	Coldenia		Desert dune sand	
	Blackbush Scrub (3.32)	queen ay		Bush (42)		Croton	Creosote Bush		plant (20d)	

	Table 6 (conti	inued)			Shrub Domi	inated Habit	ats			
	WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Eyre (1980)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
	DESERT SCRUB (continued)	Low Desert Scrub (3.4)	Stabilized and Par- tially Stabilized Sand Fields (22300) Sonoran Desert Scrub (33000) Mojavean Desert Scrub (34000) Great Basin Mixed Scrub (35100) Rabbitbrush Scrub		Blackbush Scrub (43)		Perennial Grass (SI-Galetta)	Croton Encelia Galleta Grass		
			(35400) Semi-desert Chaparral (37400)							
35	ALKALI DESERT SCRUB (ASC)	Shadscale Scrub (3.33) Alkali Scrub (3.6)	Chenopod Scrub (36000) Alkali Meadows and Seeps (45300) Alkali Meadow (45310) Alkali Playa (46000)	no corresponding vegetation type	Desert Saltbush (45) Salton Sea Salt- bush (46) San Joaquin Salt- bush (47)	Shadscale Scrub (7) Alkali Sink (9)	Perennial Grass (CV, SI-Saltgrass) Pickleweed Saltbush Shadscale	Greasewood Iodine Bush Pickleweed Saltbush Saltgrass Suaeda	not applicable	Shadscale scrub (21a) Alkali sink scrub (21b)

## **Herbaceous Dominated Habitats**

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Cowardin (1979)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
ANNUAL GRASSLAND	Valley and Foothill	Valley and Foothill Grand (42000)	not applicable	California Prairie	Valley Grassland	Annual Grass-Forb	Bromegrass	no corresponding	Vernal Pool
(AGS)	Grassiano (4.2)	Grassianu (42000)		(30)	(23)	Giass-roib	Fescue	vegeration type	Control (o)
	Vernal Pools (4.4)	Vernal Pool (44000)					Mustard		Great Central and Coast Range val-
							Needlegrass		ley grassland (11b)
							Wild Oats		Southern Califor- nia grassland
									(11c)

#### **Herbaceous Dominated Habitats**

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Cowardin (1979)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
	Coastal Prairie (4.1)	Coastal Prairie not applicable Coastal Prairie Coastal Prairie Perennial grass (41000) Coastal Prairie Coastal Prairie (CCM, NCM)	not applicable	Redwood Zone: Early Seral Grass- land/Pasture	Northern coastal prairie (11a)				
		Coastal Terrace Prairie (41100)						(1.2.2 F)	
		Bald Hills Prairie (41200)						Sinka Spruce Zone: Early Seral Grassland/Pas- ture (1.2.4 F)	
WET MEADOW (WTM)	Montane Meadow (4.51)	Meadow and Seep (45000)	not applicable	California Prairie (36)	Valley Grassland (25)	Perennial Grass (NCM)	Sedge	Arctic Alpine Zone: Tundra/	Mountain meadow (16)
	High Elevation Meadows (4.52)			Alpine Communi- ties (39)		Sedge-Rush	Wilegrass	True Fir Zone:	Alkali meadow and aquatic (21C)
	Alkali Meadows (4.54)							dow (1.1.2 G)	
	Alkali Seep (4.55)								
	Freshwater Seep (4.56)								
FRESH EMER- GENT WETLAND	Freshwater Seep (4.56)	Bog and Fen (51000)	Riverine: Lower Perennial Emer-	Tule Marsh (37)	Freshwater Marsh (3)	Cattail—Sedge (SCM)	Bulrush Cattail	Arctic Alpine Zone: Palustrine	Freshwater marsh (4a)
()	Bogs and Fens (5.1)	Coastal and Valley Freshwater Marsh (52410)	Riverine: Tidal			Sedge—Rush (NIM, NS, SS, SCM)		True Fir Zone:	Sphagnum bog (6)
	Alkali Marsh (5.23)	Transportation	Emergent weband			Jomy		Patusonie (1.1.2 b)	
	Freshwater Marshes (5.24)	Freshwater Marsh (52420)	Emergent Wetland					Palustrine (1.2.2 B)	
	Seasonal Marshes and Ponds (5.25)	Montane Fresh- water Marsh	Palustrine: Emer- gent Wetland					Mixed Evergreen Zone: Palustrine (1.2.3 B)	
	Freshwater Swamp (5.26)	(52430)						Sitka Spruce Zone: Palustrine (1.2.4 B)	
SALINE EMER-	Coastal Wetlands	Coastal Salt Marsh	Estuarine: Interti-	Coastal Saltmarsh	Coastal Saltmarsh	Cattail-Sedge	Buirush	Intertidal Estuarine	Coastal salt marsh
GENT WETLAND (SEW)	(1.2)	(52100)	dal Emergent Wetland	(38)	(2)	Pickleweed-	Zone: Eme Cordgrass Vegetation C) Pickleweed	Zone: Emergent Vegetation (2.1.2	(3)
	Coastal Salt- marshes	Coastal Brackish Marsh (52200)				Cordgrass		C)	
	(5.21=1.22)					Pickleweed	Saltgrass	Above Tide Estua- rine Wetland Zone:	
	Coastal Brackish Marsh (5.22)					Sedge—rush (CCM)	Suaeda	Diked Marsh (2.1.3 A)	

## Herbaceous Dominated Habitats

WHR Type	Cheatham and Haller (1975)	CNDDB (1986)	Cowardin (1979)	Küchler (1977)	Munz and Keck (1973)	Parker and Matyas (1981)	Paysen et al. (1980)	Proctor et al. (1980)	Thorne (1976)
PASTURE (PAS)	no corresponding vegetation type	Urban/Agri- cultural <sup>2</sup>	no corresponding vegetation type	Redwood Zone: Agricultural (1.2.2 E)	no correspondin vegetation type				
								Sitka Spruce Zone: Agricultural (1.2.4 E)	

## Aquatic Habitats

WHR Type	Cheatham and Haller (1975)	Cowardin (1979)	Proctor et al. (1980)	Thorne (1976)
RIVERINE	Streams (10.2)	Riverine	Arctic Alpine	
(RIV)	Rivers (10.3)		(1.1.1 C)	
			True Fir Zone: Riverine (1.1.2 C)	
			Redwood Zone: Riverine (1.2.2 C)	
			Mixed Evergreen Zone: Riverine (1.2.3 C)	
			Sitka Spruce Zone: Riverine (1.2.4 C)	

#### **Aquatic Habitats**

Cheatham and Haller (1975) Cowardin (1979) Proctor et al. (1980) Thorne (1976) Lakes and Ponds (10.4) LACUSTRINE (LAC) Arctic Alpine Zone: Lacustrine (1.1.1 A) Lacustrine Lake, pond, and quiet stream aqua-tic (4.b) True Fir Zone: Lacustrine (1.1.2 A) Reservoir semi-aquatic (4.c) Redwood Zone: Lacustrine (1.2.2 A) Mixed Evergreen Zone:Lacustrine (1.2.3 A) Sitka Spruce Zone: Lacustrine (1.2.4 A) Beaches and Dunes: Dune Lake (2.2.2 E) Coastal Estero (1.12) Subtidal Estuarine Tidal marsh (3a) Zone: (2.1.1) ESTUARINE Estuarine (EST) Intertidal Estuarine (2.1.2 B) Tidal Flats (1.21) Beach Surf Zone (2.2.1) Exposed Open Coast (1.3) MARINE Marine aquatic (1) Marine (MAR) Rocky Surf Zone (2.3.1) Protected Open Coast (1.4) Bays and Harbors (1.11) Oceanic Zone (3.0)

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Table 6 (continued)

**Developed Habitats** 

WHR Type	Parker and Matyas (1981)	Proctor et al. (1980)
CROPLAND (CRP)	Urban/Agri- cultural <sup>2</sup>	Redwood Zone: Agricultural (1.2.2 E)
		Sitka Spruce Zone: Agricultural (12.4 E)
ORCHARD- VINEYARD (OVN)	Urban/ Agricultural <sup>a</sup>	Redwood Zone: Agricultural (1.2.2 E)
		Sitka Spruce Zone: Agricultural (1.2.4 E)
URBAN (URB)	Urban / Agri- cultural <sup>p</sup>	Human Activity Zones: Inland (4.1)
		Human Activity Zones: Coastal (4.2)

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CNDDB solicits information to clarify these classifications
 Urban/Agricultural vegetation type is described only in Parker and Matyas (1979)