

#488

Remote Sensing Lab, Ecosystem Planning

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Projects & Plans

Vegetation Classification

Field Key To CALVEG Alliances North Sierran - Zone 3

Revised September 13, 2007

Using plant codes from the NRCS Plants Database

Pseudo species lists are used in accuracy assessment protocols

I. Key to Lifeforms

1A. If absolute canopy closure (cover) of trees (conifers and/or hardwoods) \geq 10% of plot or area ... 2

1B. If absolute canopy closure (cover) of trees is $<$ 10% of plot or area ... 4

2A. **Tree Dominated Order**: if conifers have relative canopy cover $>$ 80% of total tree canopy closure ... **conifer lifeform** and go to **II. Key to Conifers**

2B. **Tree Dominated Order**: if conifers have relative canopy cover \leq 80% of total tree canopy closure ... 3

3A. If hardwoods have relative canopy cover $>$ 90% of total tree canopy closure ... **hardwood lifeform** and go to **III. Key to Hardwoods**

3B. If hardwoods have relative canopy cover \geq 20% of total tree canopy closure and conifers have relative canopy cover \geq 10% of total tree canopy closure ... **mixed lifeform** and go to **II. Key to Conifers** for conifer component and **III. Key to Hardwoods** for hardwood component.

4A. **Shrub Dominated Order** : if absolute cover of shrubs \geq 10% of plot or area ... **shrub lifeform** and go to **IV. Key to Shrubs and Subshrubs**

4B. If absolute cover of shrubs $<$ 10% of plot or area ... 5

5A. **Herbaceous or Non-Vascular Dominated Order**: if absolute cover of other vascular vegetation is \geq 10% of plot or area ... **herbaceous lifeform** and go to **V. Key to Grasses and Forbs**

5B. If absolute cover of other vascular vegetation is $<$ 10% of plot or area ... **sparsely vegetated or non-vegetated lifeform** and go to **VI. Key to Sparsely Vegetated and Non-Vegetated Types**

II. Key to Conifers

cc = conifer canopy cover

sc = shrub canopy cover

1A. One conifer species (or genus) has \geq 50% cc ... 2

1B. No single conifer species (or genus) has \geq 50% cc ... 23

2A. **McNab Cypress [PSEUDO24: CUPRE, CUMA]** has \geq 50% cc ... **McNab Cypress - MN**

2B. Otherwise ... 3

3A. **Giant Sequoia (SEGI2)** has \geq 50% cc ... **Big Tree - BT**

3B. Otherwise....4

4A. **Jeffrey Pine (PIJE)** has \geq 75% cc and Great Basin shrub (**Low Sagebrush, Basin Sagebrush, Unknown Sagebrush, Curleaf**

Mountain Mahogany, California Juniper, Bitterbrush) and/or conifer species (**California Juniper, Utah Juniper**) alone or in combination [PSEUDO2SHB: ARAR8, ARTR2, ARTEM, CELE3, JUCA7, PUTR2] and/or [PSEUDO2CON: JUCA7, JUOS] are not present ... **Jeffrey Pine - JP**

4B. Otherwise ... 5

5A. **Jeffrey Pine (PIJE)** has $\geq 75\%$ cc (or **Ponderosa Pine** and **Jeffrey Pine [PSEUDO4: PIPO, PIJE]** in combination have $\geq 75\%$ cc) and Great Basin shrub and/or conifer species [PSEUDO2SHB and/or PSEUDO2CON] occur ... **Eastside Pine - EP**

5B. Otherwise ... 6

6A. **Ponderosa Pine (PIPO)** has $\geq 75\%$ cc and Great Basin species [PSEUDO2SHB and/or PSEUDO2CON] are not present ...

Ponderosa Pine - PP

6B. Otherwise ... 7

7A. **Pacific Douglas-Fir (PSME)** has $\geq 75\%$ cc ... **Douglas Fir - DF**

7B. Otherwise ... 8

8A. **Mountain Hemlock (TSME)** has $\geq 75\%$ cc ... **Mountain Hemlock - MH**

8B. Otherwise ... 9

9A. **Knobcone Pine (PIAT)** has $\geq 75\%$ cc ... **Knobcone Pine - KP**

9B. Otherwise ... 10

10A. **Western Juniper (JUOC)** has $\geq 75\%$ cc ... **Western Juniper - WJ**

10B. Otherwise ... 11

11A. **Gray Pine (PISA2)** has $\geq 75\%$... **Gray Pine - PD**

11B. Otherwise ... 12

12A. **Lodgepole Pine (PICO)** has $\geq 75\%$ cc ... **Lodgepole Pine - LP**

12B. Otherwise ... 13

13A. **Western White Pine (PIMO3)** has $\geq 75\%$ cc ... **Western White Pine - WW**

13B. Otherwise ... 14

14A. **Incense Cedar (CADE27)** has $\geq 75\%$ cc ... **Incense Cedar - MD**

14B. Otherwise ... 15

15A. **Whitebark Pine (PIAL)** has $\geq 75\%$ cc ... **Whitebark Pine - WB**

15B. Otherwise ... 16

16A. **Washoe Pine (PIWA)** has $\geq 75\%$ cc ... **Washoe Pine - WP**

16B. Otherwise ... 17

17A. **Red Fir (ABMA)** has $\geq 75\%$ cc ... **Red Fir - RF**

17B. Otherwise ... 18

18A. **White Fir (ABCO)** has $\geq 75\%$ cc ... **White Fir - WF**

18B. Otherwise ... 19

19A. **Red Fir (ABMA)** in combination with **White Fir (ABCO)** [PSEUDO1: ABCO, ABMA] has $\geq 75\%$ cc and **Red Fir > White Fir ... Red Fir - RF**

19B. Otherwise ... 20

20A. **White Fir (ABCO)** and/or **Red Fir (ABMA)** [PSEUDO1: ABCO, ABMA] in combination have $\geq 75\%$ cc and **White Fir > Red Fir ... White Fir - WF**

20B. Otherwise ... 21

21A. **Pacific Douglas-Fir (PSME)** has $\geq 50\%$ sc and **Ponderosa Pine (PIPO)** has $\geq 20\%$ cc (or **PSME** and **PIPO** both occur and in combination have $\geq 75\%$) ... **Douglas-Fir - Pine - DP**

21B. Otherwise ... 22

22A. **Singleleaf Pinyon Pine (PIMO, PIED)** has $\geq 75\%$ cc ... **Pinyon-Juniper - PJ**
 22B. Otherwise ... 23

Mixed Conifer Species:

23A. Any combination of **Whitebark Pine (PIAL)**, and/or **Mountain Hemlock (TSME)**, and/or **Western White Pine (PIMO3)** occurs [PSEUDO5: PIAL, TSME, PIMO3] ... **Subalpine Conifers - SA**
 23B. Otherwise ... 24

24A. **Giant Sequoia (SEGI2)** is present but has $< 50\%$ cc ... **Mixed Conifer - Giant Sequoia - MB**
 24B. Otherwise ... 25

25A. **Singleleaf Pinyon Pine (PIMO)** and eastside **Junipers (JUOS, JUCA7)** in combination have $\geq 75\%$ cc ... **Pinyon - Juniper - PJ**
 25B. Otherwise ... 26

26A. **Jeffrey Pine (PIJE)** and **Western Juniper (JUOC)** in combination have $\geq 75\%$ cc and Great Basin shrubs [PSEUDO2SHB] and/or conifers [PSEUDO2CON] are not present ... **Jeffrey Pine - JP**
 26B. Otherwise ... 27

27A. **Jeffrey Pine (PIJE)** and **Western Juniper (JUOC)** in combination have $\geq 75\%$ cc and Great Basin shrubs [PSEUDO2SHB] and/or conifers [PSEUDO2CON] are present ... **Eastside Pine - EP**
 27B. Otherwise ... 28

28A. **Ponderosa Pine (PIPO)**, and/or **Sugar Pine (PILA)** in combination have $\geq 10\%$ cc and **White Fir (ABCO)** exists [PSEUDO6: PILA, PIPO; ABCO] ... **Mixed Conifer - Pine - MP**
 28B. Otherwise ... 29

29A. **White Fir (ABCO)** and/or **Red Fir (ABMA)** in combination [PSEUDO1: ABCO, ABMA] have $\geq 20\%$ cc ... **Mixed Conifer - Fir - MF**
 29B. Otherwise... 30

30A. Hardwoods have $\geq 20\%$ of total plot cover. Non-native/ornamental conifer mixture has $\geq 50\%$ of conifer canopy cover and non-native hardwood mixture has $\geq 50\%$ of hardwood canopy cover ... **Non-Native/Ornamental Conifer-Hardwood - IM**
 30B. Otherwise ... 31

31A. Mixture of non-native/ornamental conifers is $\geq 50\%$ cc ... **Non-Native/Ornamental Conifers - IC**
 31B. Otherwise ... 32

32A. Single or multiple species of conifers on agricultural sites have $\geq 50\%$ cc and agricultural hardwoods have $< 20\%$ of total tree canopy cover ... **Conifer Agriculture - AI**
 32B. Otherwise ... 33

33A. Single or multiple species of conifers on agricultural sites have $\geq 50\%$ cc and agricultural hardwoods have $\geq 20\%$ of total tree canopy cover ... **Agricultural Nurseries - A8**
 33B. Otherwise ... 34

34. Conifer type not determined ... **XC**

III. Key to Hardwoods

hc = hardwood canopy cover

1A. One single hardwood species (or genus) has $\geq 50\%$ hc ... 2
 1B. No single hardwood species (or genus) has $\geq 50\%$ hc ... 20

2A. **Tanoak (LIDE3)** has $\geq 50\%$ hc ... **Tanoak - QT**
 2B. Otherwise ... 3

3A. **Madrone (ARME)** has $\geq 50\%$ hc ... **Madrone - QH**

3B. Otherwise ... 4

4A. **Bigleaf Maple (ACMA3)** has $\geq 50\%$ hc ... **Bigleaf Maple - QM**

4B. Otherwise ... 5

5A. **White Alder (ALRH2)** has $\geq 50\%$ hc ... **White Alder - QE**

5B. Otherwise ... 6

6A. **Quaking Aspen (POTR5)** has $\geq 50\%$ hc ... **Aspen - QQ**

6B. Otherwise ... 7

7A. Arboreal **Dogwood** species [PSEUDO32: CORNUS, CONU4] have $\geq 50\%$ hc ... **Dogwood - WD**

7B. Otherwise ... 8

8A. **Blue Oak (QUDO)** has $\geq 50\%$ hc ... **Blue Oak - QD**

8B. Otherwise ... 9

9A. **California Black Oak (QUKE)** has $\geq 50\%$ hc ... **Black Oak - QK**

9B. Otherwise ... 10

10A. **California Bay (UMCA)** has $\geq 50\%$ hc ... **California Bay - QB**

10B. Otherwise ... 11

11A. **Canyon Live Oak (QUCH2)** has $\geq 50\%$ hc ... **Canyon Live Oak - QC**

11B. Otherwise ... 12

12A. **Interior Live Oak (QUWI2)** has $\geq 50\%$ hc ... **Interior Live Oak - QW**

12B. Otherwise ... 13

13A. **California Buckeye (AECA)** has $\geq 50\%$ hc ... **Buckeye - QI**

13B. Otherwise ... 14

14A. **Black Cottonwood (POTR15)** has $\geq 50\%$ hc ... **Black Cottonwood - QX**

14B. Otherwise ... 15

15A. **Valley Oak (QULO)** has $\geq 50\%$ hc ... **Valley Oak - QL**

15B. Otherwise ... 16

16A. Tree **Willows** of any species (SALIX) alone or in combination have $\geq 50\%$ hc ... **Willow - QO**

16B. Otherwise ... 17

17A. **Fremont Cottonwood (POFR2)** has $\geq 50\%$ hc ... **Fremont Cottonwood - QF**

17B. Otherwise ... 18

18A. **Curleaf Mountain Mahogany**, tree form (CELE3) has $\geq 50\%$ hc ... **Curleaf Mountain Mahogany - FM**

18B. Otherwise ... 19

19A. **Tree Chinquapin (CHCH7)** has $\geq 50\%$ hc ... **Tree Chinquapin - TC**

19B. Otherwise ... 20

Mixed Hardwood Species:

20A. **Bigleaf Maple (ACMA3)** and tree-form **Dogwood (CORNUS, CONU4)** in combination [PSEUDO10: ACMA3, CORNUS, CONU4] have $\geq 50\%$ hc ... **Bigleaf Maple - QM**

20B. Otherwise ... 21

21A. **Black Cottonwood (POTR15)** and/or **Fremont Cottonwood (POFR2)** [PSEUDO12: POFR2, POTR15] and tree-form **White Alder (ALRH2)** are present and in combination [PSEUDO26: POTR15, POFR2, ALRH2] have $\geq 50\%$ hc ... **Cottonwood-Alder - QJ**

21B. Otherwise ... 22

22A. **Quaking Aspen (POTR5)** and any tree species of **Willow (SALIX)** are present and in combination [PSEUDO27: POTR5, SALIX] have $\geq 50\%$ cover ... **Willow-Aspen - QS**

22B. Otherwise ... 23

23A. Tree-form **White Alder (ALRH2)** and any tree species of **Willow (SALIX)** are both present and in combination [PSEUDO28: SALIX, ALRH2] have $\geq 50\%$ cover ... **Willow-Alder - QY**

23B. Otherwise ... 24

24A. Tree-form riparian hardwood species: [**California Sycamore (PLRA)**, **Dogwood (CORNUS, CONU4)**, **Bigleaf Maple (ACMA3)**, **White Alder (ALRH2)**, **Box Elder (ACNEC2)**, **Fremont Cottonwood (POFR2)**, **Black Cottonwood (POTR15)**, **Aspen (POTR5)**, and/or **Valley Oak (QULO)**] in combination [PSEUDO22: PLRA, CORNUS, CONU4, ACMA3, ALRH2, ACNEC2, POFR2, POTR15, POTR5, QULO] have $\geq 50\%$ hc ... **Mixed Riparian Hardwoods - NR**

24B. Otherwise ... 25

25A. Lower elevation, interior, native hardwoods [**California Bay (UMCA)**, **California Buckeye (AECA)**, **Canyon Live Oak (QUCH2)**, **Blue Oak (QUDO)** and/or **Interior Live Oak (QUWI2)**] in combination [PSEUDO23: UMCA, AECA, QUCH2, QUDO, QUWI2, 2TDBD] have $\geq 50\%$ hc ... **Interior Mixed Hardwoods - NX**

25B. Otherwise ... 26

26A. Montane, native hardwoods [**Madrone (ARME)**, **Tanoak (LIDE3)**, **California Black Oak (QUKE)**, **Bigleaf Maple (ACMA3)**, and/or tree-form **Dogwood (CORNUS, CONU4)**] in combination [PSEUDO33: ARME, LIDE3, QUKE, ACMA3, CORNUS, CONU4] have $\geq 50\%$ hc ... **Montane Mixed Hardwoods - TX**

26B. Otherwise ... 27

27A. Non-native hardwood species alone or in mixture are $\geq 50\%$ of hardwood canopy cover ... **Non-Native/Ornamental Hardwood - IH**

27B. Otherwise ... 28

28A. Agricultural lands have $\geq 50\%$ hc ... **Orchard Agriculture - A4**

28B. Otherwise ... 29

29. Hardwood type not determined ... **XH**

IV. Key to Shrubs

sc = shrub canopy cover

1A. One species or genus has $\geq 50\%$ shrub canopy cover (sc) ... 2

1B. No single species or genus has $\geq 50\%$ sc ... 28

2A. Elevation > 7900 feet and alpine or subalpine areas with indicator shrubs and/or dwarf shrubs [**Rothrock Sagebrush (ARRO4)**, **Shrubby Cinquefoil (POFR4)**, **Sierran Beardtongue (PEHE2)**, **Mountain Pride (PENE3)**, **Arctic Willow (SAAR27)**, **Sierra Willows (SAEA, SAOR)**, **Snow Willow (SARE2)**, **White Heather (CAME7)**, **Mountain Heather (PHBR4)**, **Alpine Pricky Currant (RIMO2)**, **Dwarf Bilberry (VAAR2)**, **Cascade Bilberry (VANI3)**] singly or in combination [PSEUDO35: ARRO4, POFR4, PEHE2, PENE3, SAAR27, SAEA, SAOR, SARE2, CAME7, PHBR4, RIMO2, VAAR2, VANI3] exist ... **Mixed Alpine Scrub - AX**

2B. Otherwise ... 3

3A. **Chamise (ADFA)** has $\geq 50\%$ sc ... **Chamise - CA**

3B. Otherwise ... 4

4A. **Huckleberry Oak (QUVA)** has $\geq 50\%$ sc ... **Huckleberry Oak - CH**

4B. Otherwise ... 5

5A. **Whiteleaf Manzanita (ARVI4)** has $\geq 50\%$ sc ... **Whiteleaf Manzanita - CW**

5B. Otherwise ... 6

6A. **Bitterbrush [PSEUDO36: PUTR2, PUGL2]** has $\geq 50\%$ sc ... **Bitterbrush - BB**

6B. Otherwise ... 7

7A. Shrub form of **Curl-leaf Mountain Mahogany (CELE3)** has $\geq 50\%$ sc ... **Curlleaf Mountain Mahogany - BM**

7B. Otherwise ... 8

8A. **Low Sagebrush (ARAR8)** has $\geq 50\%$ shrub cover ... **Low Sagebrush - BL**

8B. Otherwise ... 9

9A. **Basin Sagebrush [PSEUDO14: ARTR2, ARTEM]** has $\geq 50\%$ sc ... **Basin Sagebrush - BS**

9B. Otherwise ... 10

10A. **Deerbrush (CEIN3)** has $\geq 50\%$ sc ... **Deerbrush - CI**

10B. Otherwise ... 11

11A. **Wedgeleaf Ceanothus (CECU)** has $\geq 50\%$ sc ... **Wedgeleaf Ceanothus - CL**

11B. Otherwise ... 12

12A. **Snowbrush (CEVE)** has $\geq 50\%$ sc ... **Snowbrush - CV**

12B. Otherwise ... 13

13A. **Mountain Alder (ALTE2)** has $\geq 50\%$ sc ... **Mountain Alder - TA**

13B. Otherwise ... 14

14A. Shrub forms of **Oaks [PSEUDO16: QUDU, QUCHN, QUWIF, QUVA, QUKE, QUGAB]** in any combination have $\geq 50\%$ sc ... **Scrub Oak-CS**

14B. Otherwise ... 15

15A. Shrub-form **Willow [PSEUDO34: SASC, SALIX]** has $\geq 50\%$ sc ... **Willow - WL**

15B. Otherwise ... 16

16A. **Greenleaf Manzanita (ARPA6)** has $\geq 50\%$ shrub cover ... **Greenleaf Manzanita - CG**

16B. Otherwise ... 17

17A. **Rabbitbrush (CHRYS9, CHNA2, CHVI8, CHAL9, CHNAC3, ERNA10)** has $\geq 50\%$ sc ... **Rabbitbrush - BR**

17B. Otherwise ... 18

18A. **Pinemat Manzanita (ARNE)** has $> 50\%$ shrub cover ... **Pinemat Manzanita - CN**

18B. Otherwise ... 19

19A. **Bush Chinquapin (CHSE11, CASE8)** has $\geq 50\%$ shrub cover ... **Bush Chinquapin - CP**

19B. Otherwise ... 20

20A. **Mountain Whitethorn (CECO)** has $\geq 50\%$ shrub cover ... **Mountain Whitethorn - CY**

20B. Otherwise ... 21

21A. Any species of **Ceanothus (Chaparral Whitethorn, Lemmon, Mahala Mat, Deerbrush, Mountain Whitethorn, Wedgeleaf, Pine Mat, Woollyleaf, Snowbrush, Unknown species)** alone or in combination [PSEUDO15: CELE2, CELE, CEPR, CEIN3, CECO, CECU, CEDI2, CETO, CEVE, CEANO] has $\geq 50\%$ sc ... **Ceanothus Chaparral - CC**

21B. Otherwise ... 22

22A. **Mountain Sagebrush (ARTRV, ARTRV2, ARVA2)** has $\geq 50\%$ shrub cover ... **Mountain Sagebrush - TV**

22B. Otherwise ... 23

23A. **Big Basin Sagebrush (ARTRT)** has $\geq 50\%$ shrub cover ... **Big Basin Sagebrush - TT**

23B. Otherwise ... 24

24A. **Black Sagebrush (ARNO4)** has $\geq 50\%$ shrub cover ... **Black Sagebrush - TN**

24B. Otherwise ... 25

25A. **Snowberry (SYMPH)** of any species, such as **Sharpleaf (SYAC)** and **Mountain (SYOR2, SYVA)** has $\geq 50\%$ shrub cover ... **Snowberry - TS**

25B. Otherwise ... 26

26A. **Nissenan Manzanita (ARNI)** has $\geq 50\%$ shrub cover ... **Nissenan Manzanita - NI**

26B. Otherwise ... 27

27A. Shrub form of **Aspen (POTR5)** has $\geq 50\%$ shrub cover ... **Aspen - KQ**

27B. Otherwise ... 28

Mixed shrub species:

28A. Upper montane hard chaparral species [PSEUDO18] singly or in combination have $\geq 25\%$ shrub cover, none dominant and Great Basin shrub species [PSEUDO2SHB] have $\geq 25\%$ shrub cover ... **Great Basin - Mixed Chaparral Transition - BX**

28B. Otherwise ... 29

29A. Great Basin species [PSEUDO2SHB]; Mojave shrub species [Creosote (LATR2), Ephedra (EPHED, EPNE, EPVI), Blackbush (COR), White Bursage (AMDU2), Spiny Menodora (MESP2), Spiny Hopsage (GRSP), Horsebrush (TEAR, TEAX, TECA2, TECO2, TEDI, TEGL, TEST2, TETRA3), Sonoran Scrub Oak (QUTU2) and/or Opuntia species (OPUNT, OPPA2, OPER, OPPU)] have $< 20\%$ shrub cover. Species of Currant or Gooseberry (RIBES), Wax Currant (RIVE), Snowberry (SYMPH, SYOR2, SYORO, SYVA) or Rose (ROSA5, ROWO) are often present ... **Basin Mixed Scrub - BQ**

29B. Otherwise ... 30

30A. Bitterbrush (PUGL2) plus any combination of Artemisia species [Low Sagebrush (ARAR8), Mountain Sagebrush (ARTRV), Big Basin Sagebrush (ARTRT), Wyoming Sagebrush (ARTRW8), Black Sagebrush (ARNO4), Silver Sagebrush (ARCA13), Unknown Sagebrush (ARTEM)] have in combination $\geq 50\%$ sc ... **Bitterbrush - Sagebrush - TB**

30B. Otherwise ... 31

31A. Any of the following shrubs: Chamise, Common Manzanita, Nissenan Manzanita, Whiteleaf Manzanita, Birchleaf Mountain Mahogany, Wedgeleaf Ceanothus, Pine Mat Ceanothus, Lemmon Ceanothus, Redbud, California Yerba Santa, Toyon, California Coffeeberry, Hoary Coffeeberry, Redberry, Hollyleaf Redberry, Cascara or Poison Oak alone or in combination have $\geq 20\%$ sc [PSEUDO17: ADFA, ARMA, ARNI, ARVI4, CEBE3, CECU, CEDI2, CELE, CEOCO, ERCA6, HEAR5, RHCA, FRCAT2, RHCR, RHCR12, RHPU, TODI] ... **Lower Montane Mixed Chaparral - CQ**

31B. Otherwise ... 32

32A. Any of the following shrub species: Greenleaf Manzanita, Mountain Whitethorn, Deerbrush, Shrub Canyon Live Oak, Bush Chinquapin, Fremont Silktassel, Creeping Snowberry, Unknown Snowberry, Mahala Mat, Mountain Snowberry, Snowbrush or Sierra Coffeeberry in combination of two or more [PSEUDO18: ARPA6, CECO, CEIN3, QUCHN, CASE8, GAFR, SYMO, SYMPH, CEPR, SYAC, CEVE, RHRU] have $\geq 20\%$ sc: ... **Upper Montane Mixed Chaparral - CX**

32B. Otherwise ... 33

33A. Elevation < 5000 ft (1525 m) and any of the following: Shrub Tanoak, Whiteleaf Manzanita or Wedgeleaf Ceanothus in combination [PSEUDO19: LIDEE, ARVI4, CECU] on ultramafic substrates have $\geq 20\%$ sc: ... **Ultramafic Mixed Shrub - CI**

33B. Otherwise ... 34

34A. Elevation ≥ 5000 ft (1525 m) and any of following: Bush Chinquapin, Pinemat Manzanita, Huckleberry Oak or Creeping Snowberry alone or in combination [PSEUDO20: CASE8, ARNE, QUVA, SYMO] have $\geq 20\%$ sc ... **Upper Montane Mixed Shrub - CM**

34B. Otherwise ... 35

35A. Nissenan Manzanita (ARNI) has $\geq 25\%$ shrub cover ... **Nissenan Manzanita - NI**

35B. Otherwise ... 36

36A. Non-native, invasive or ornamental cultivated shrubs have $\geq 50\%$ sc ... **Non-Native/Ornamental Shrub - IS**

36B. Otherwise ... 37

37A. Agricultural lands have $\geq 50\%$ sc ... **Vineyard - Shrub Agriculture - A2**

37B. Otherwise ... 38

38. Unknown shrub type ... **XS**

V. Key to Herbaceous

hg = herbaceous/grass canopy cover

1A. Exposed alpine and subalpine areas with various herbaceous plants and graminoids in the High Sierras; indicators are: **Alpine Hulsea (HUAL)**, **Alpine Saxifrage (SATO2)**, **Mountain Sorrel (OXDI3)**, **Jacob's Ladder (POPU3)**, **Tufted and Dwarf Phlox (PHDO3, PHCO11)**, **Sierra and Rocky Mountain Pussytoes (ANPU8, ANME2)**, **Sierra Primrose (PRSU)**, **Alpine Buttercup (RAES)**, **Alpine**

Aster (ASAL2), Pygmy Daisy (ERPY), Prostrate Sibbaldia (SIPR), various Buckwheats (ERIOG), various Rockcreeses (DRIN8, DRDE, DRLE, DRBR2), Sierra Podistera (PONE4), Rockfringe (EPOB), Sedges (CAREX), Rushes (JUNCU), Shorthair Reedgrass (CABR), Squirreltail (ELEL5), and Smallflower Fescue (FEMI3) ... Alpine Mixed Grasses and Forbs - AC

1B. Otherwise ... 2

2A. Annual grasses mixed with annual and/or perennial forbs have $\geq 50\%$ hg ... **Annual Grasses and Forbs - HG**

2B. Otherwise ... 3

3A. Hydrophytic grasses and grass-like species [Sedges (CAREX), Nutsedges (CYPER), Rushes (JUNCU), Spikerushes (ELEOC)] in mixture with hydrophytic herbaceous species [False Hellebore (VECA2, VECAC2), Western Blue Flag (IRMI), Shooting Star (DOAL, DOJE, DORE, DOSU)], Gentians [Swertia (SWERT), Gentiana (GENTI), Gentiella (GENTI2), Gentianopsis (GENT3)] growing mainly in organic soil have $\geq 50\%$ hg ... **Wet Meadows - HJ**

3B. Otherwise ... 4

4A. Pastures or semi-natural areas containing mixtures of annual and perennial grasses and annual and/or perennial forbs have $\geq 50\%$ hg ... **Perennial Grasses and Forbs - HM**

4B. Otherwise ... 5

5A. Marshes adjacent to perennial fresh water sources containing mixtures of Tule (SCAC) or other Bulrushes (SCIRP) and Cattails (TYPHA) rooting below the water's surface have $\geq 50\%$ hg ... **Tule - Cattail - HT**

5B. Otherwise ... 6

6A. Non-native cultivated grasses and herbaceous cover in mixture have $\geq 50\%$ hg ... **Non-Native/Ornamental Grasses - IG**

6B. Otherwise ... 7

7A. Non-native herbaceous species, either planted or invasive, have $\geq 50\%$ hg ... **Non-Native/Invasive Forb/Grass - IF**

7B. Otherwise ... 8

8A. Agricultural lands have $\geq 50\%$ hg in row crops and are not usually flooded ... **Grain and Crop Agriculture - A6**

8B. Otherwise ... 9

9A. Agricultural lands have $\geq 50\%$ hg in row crops and are usually flooded ... **Flooded Row Crop Agriculture - A5**

9B. Otherwise ... 10

10. Unknown herbaceous or grassland type ... **XG (dry) or XJ (wet)**

VI. Key to Non-Vegetated Types

nvc = non-vegetated cover

1A. Dry urbanized or developed lands have $\geq 50\%$ nvc ... **Urban-related Bare Soil - IB**

1B. Otherwise ... 2

2A. Wet urbanized or developed lands have $\geq 50\%$ nvc ... **Developed Water Features - IW**

2B. Otherwise ... 3

3A. Dry agricultural lands have $\geq 50\%$ nvc ... **Tilled Earth Agriculture- A3**

3B. Otherwise ... 4

4A. Wet agricultural lands have $\geq 50\%$ nvc ... **Agricultural Ponds or Surface Water - A7**

4B. Otherwise ... 5

5A. Other Agricultural uses comprise $\geq 50\%$ nvc ... **Agriculture - AG**

5B. Otherwise ... 6

6A. Snow or ice fields at the highest elevations comprise $\geq 50\%$ nvc ... **Snow/Ice - SN**

6B. Otherwise ... 7

7A. Urban or otherwise developed landscapes (highways, etc.) occupy $\geq 50\%$ nvc ... **Urban or Developed - UB**

7B. Otherwise ... 8

8A. Open water or confined water courses occupy $\geq 50\%$ nvc ... **Water - WA**

8B. Otherwise ... 9

9A. Otherwise naturally barren landscapes (cliffs, bedrock, etc.) occupy $\geq 50\%$ nvc ... **Barren - BA**

9B. Otherwise ... 10

10. **Unknown non-vegetated type - XZ**