

Mapping and Vegetation Classification of Mendocino Cypress Woodlands as the Path Toward Effective Conservation



Teresa Sholars
CDFW/CNPS Webinar
Dec 2, 2021



The Problem

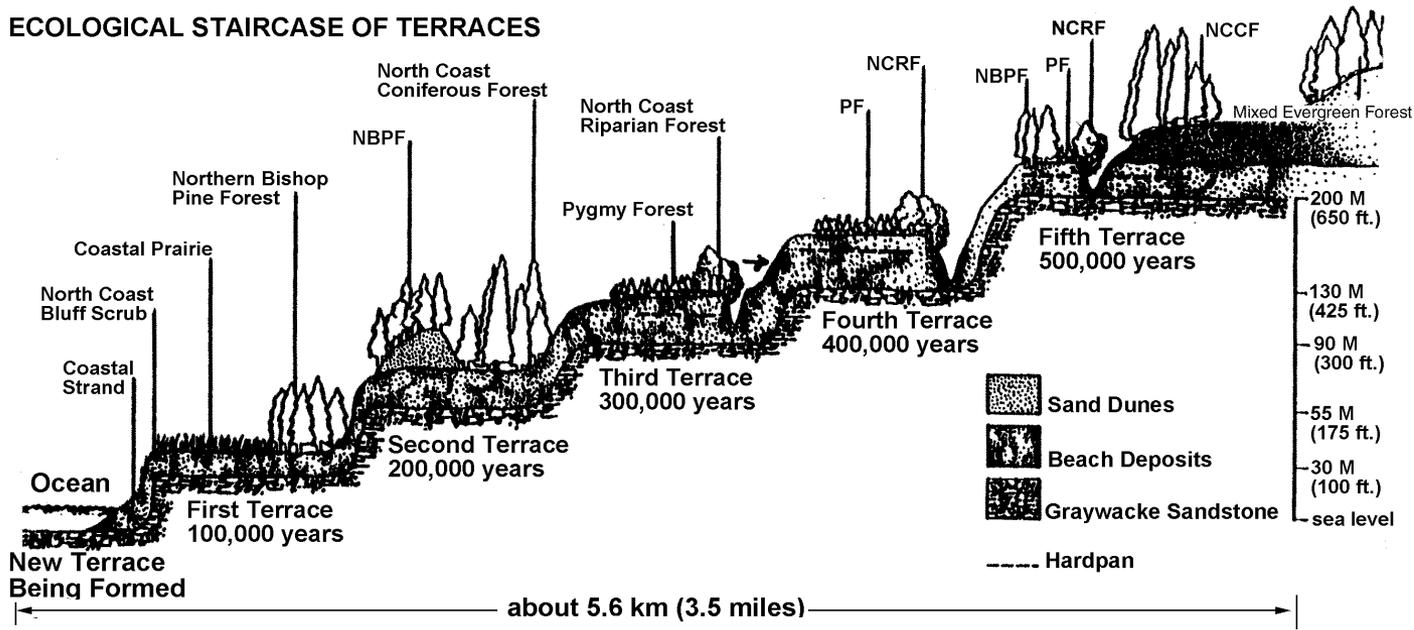
The pygmy forest has long been recognized as a rare plant community filled with rare plants. However, our conservation efforts have been hampered by the ambiguous nature of defining what is pygmy forest and what it isn't.



This is because **only some** of the forest types are short in stature.



ECOLOGICAL STAIRCASE OF TERRACES



This is the classic definition but it is more complicated

“A series of terraces were uplifted flat in just a few areas; setting the stage for the creation of old, nutrient poor highly acidic soils dominated by the Mendocino cypress known as the Pygmy forest”.



Defining the Community



In the past we have generally defined pygmy forest as a plant community that is dominated by the pygmy cypress (*Hesperocyparis pygmaea*) and Bolander or pygmy pine (*Pinus contorta ssp. bolanderi*).



But the growth stature of cypress and pine is determined by the soils resulting in a high diversity of heights and species composition.

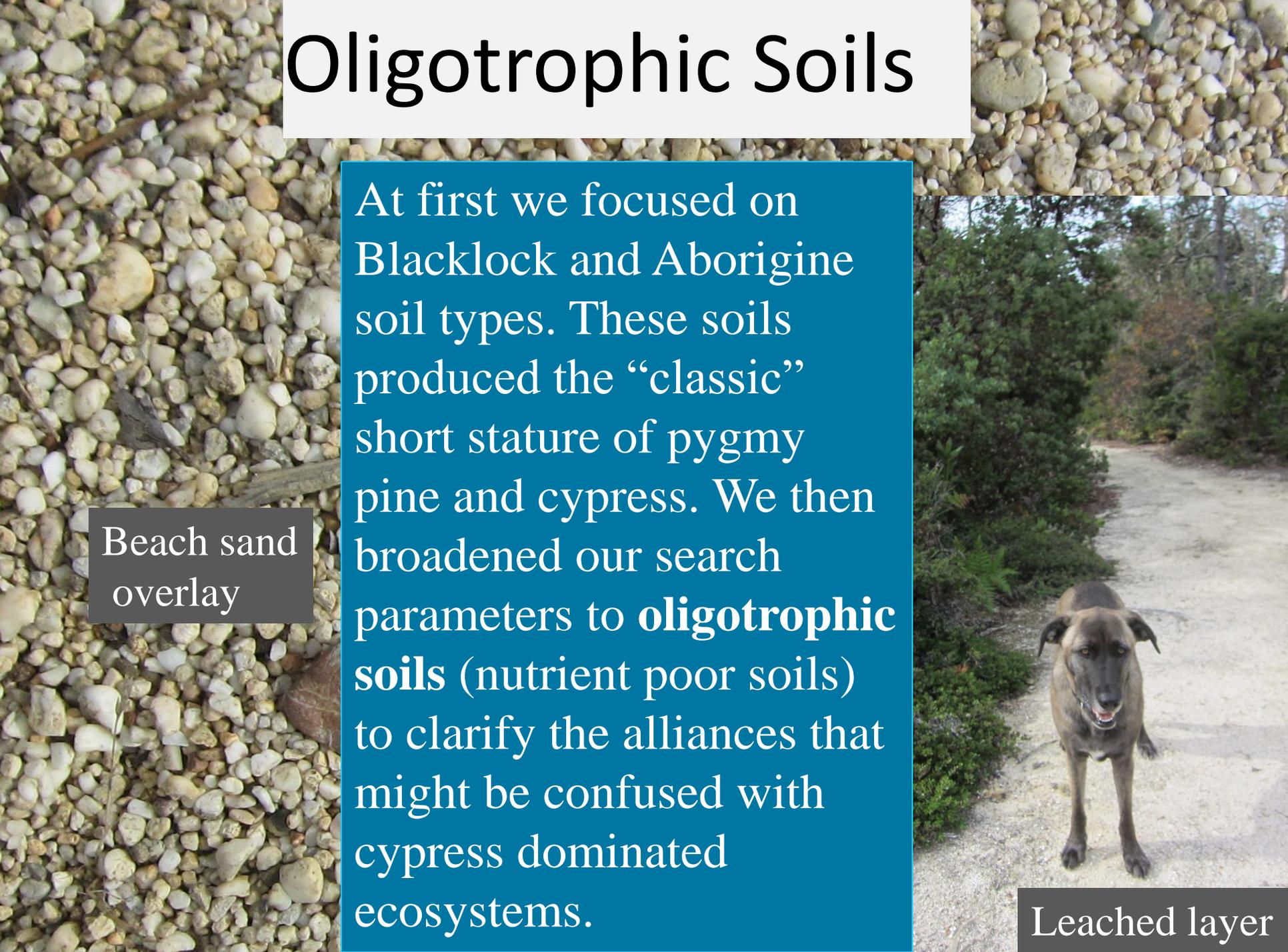


Oligotrophic Soils

At first we focused on Blacklock and Aborigine soil types. These soils produced the “classic” short stature of pygmy pine and cypress. We then broadened our search parameters to **oligotrophic soils** (nutrient poor soils) to clarify the alliances that might be confused with cypress dominated ecosystems.

Beach sand
overlay

Leached layer



“It looks like pygmy forest”



There is a lot of vegetation called pygmy that lacked the cypress on oligotrophic soils



Oligotrophic Soils

= nutrient poor soils:
Blacklock, Aborigine
Shinglemill-Gibney
complex, Tropoquept
Gibney-Gibwell
complex, Gibwell
loamy sand, Noyo,
Seaside-Rock outcrop
complex, Tregoning-
Cleone complex

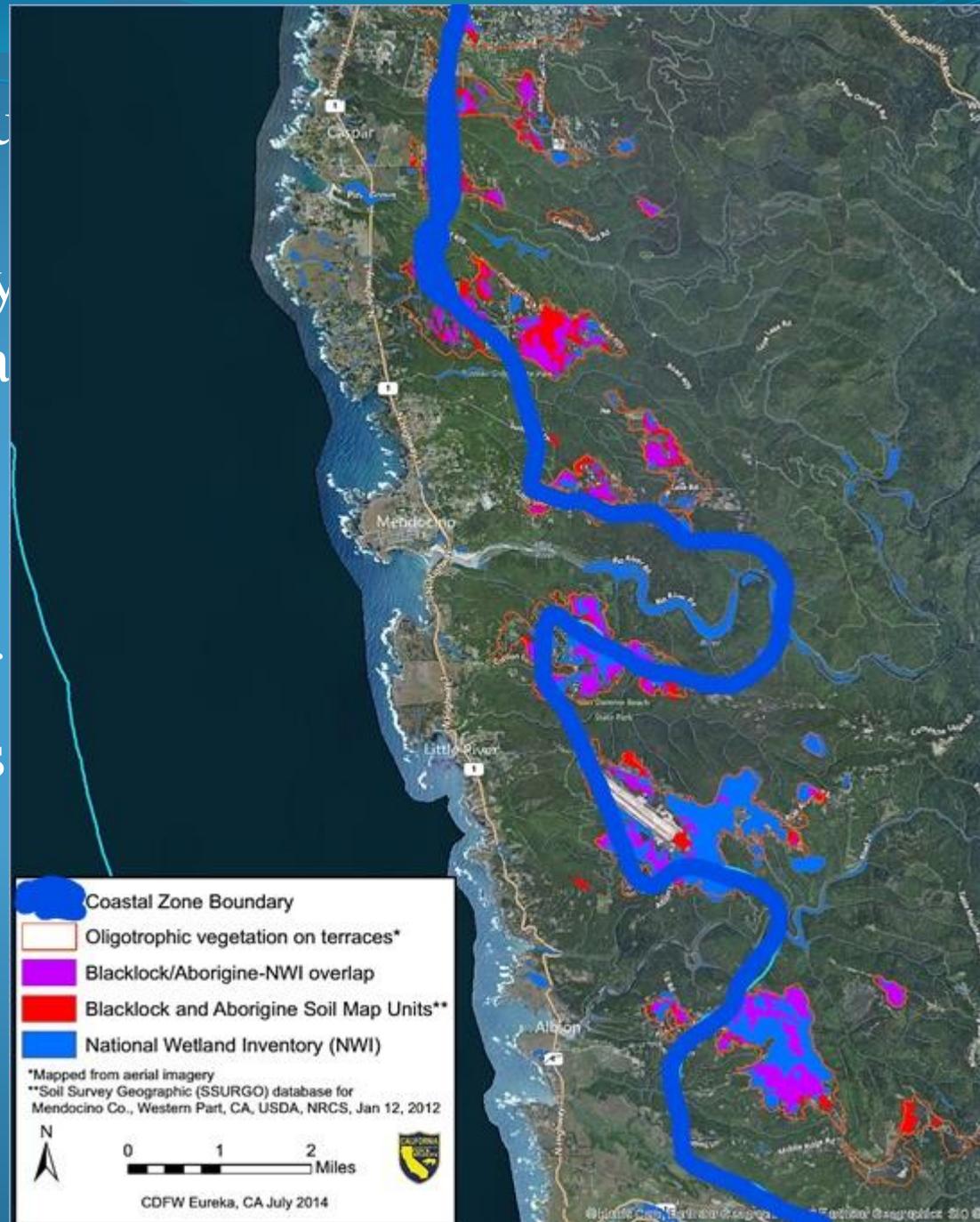




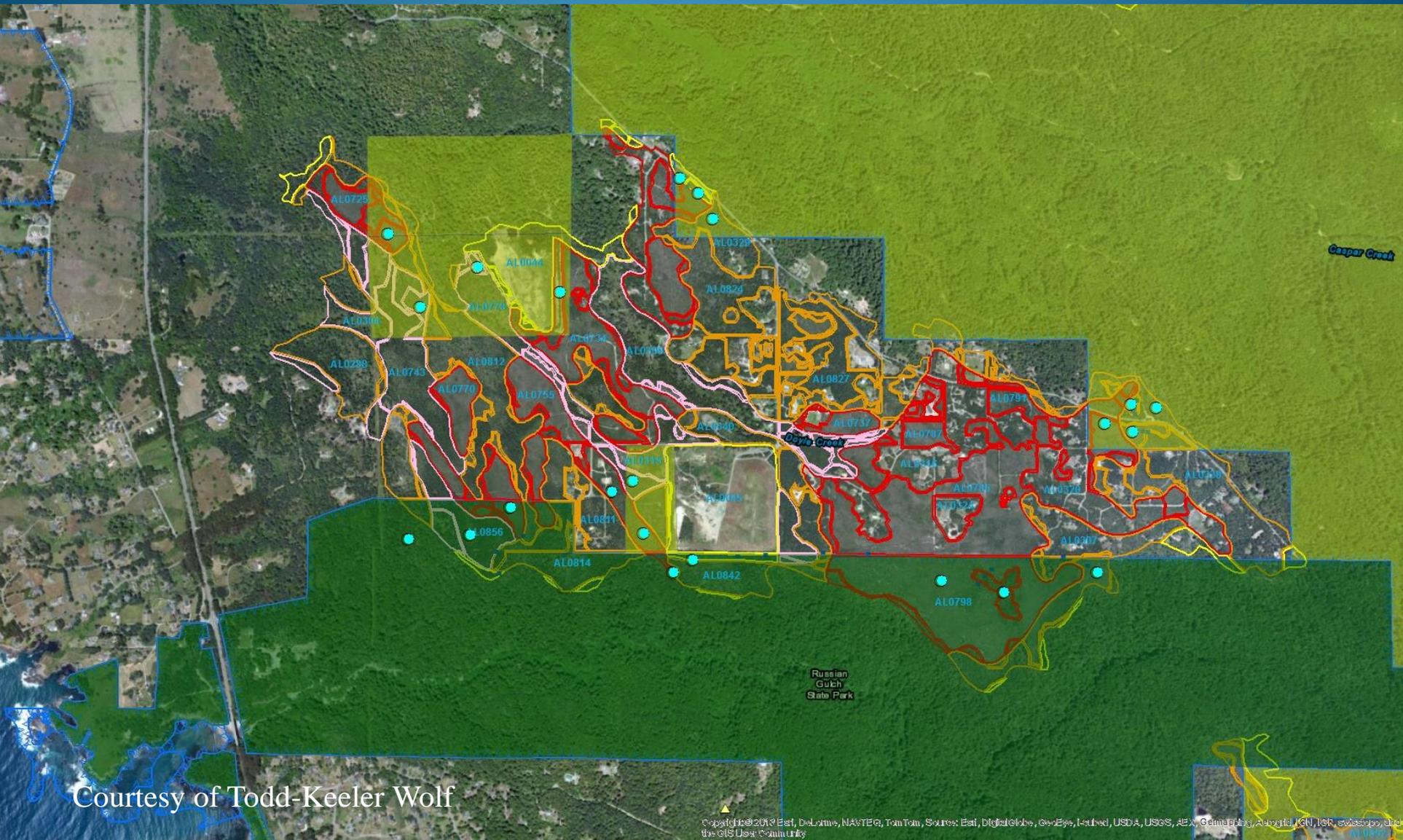
Haley Ross photo

CDFW's Vegetation Classification and Mapping Program (VegCAMP) and local staff partnered with CNPS, landowners, and volunteers to conduct vegetation sampling to classify, map, and quantify Mendocino Pygmy Cypress Woodland (MPCW), also known as "pygmy forest," and closely related habitats

Before completion of our mapping project Mendocino County only protected Environmental Sensitive Habitat Areas (ESHAs) in the coastal zone, delineated by the blue line. Note much of the pygmy ecosystem is outside the zone.



Sample selections based on oligotrophic polygon type, veg signature, and access.



Courtesy of Todd-Keeler Wolf

Courtesy of Linda Miller

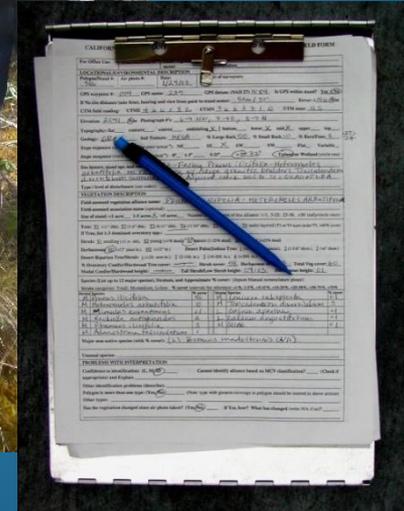


West



Vegetation sampling used CNPS/CDFW protocol and broke into multiple teams to collect info on:

- Species list – vascular plant composition and cover
- Community composition - vertical structure and physiognomy of vegetation by strata



To finish the project accuracy assessment was completed in 2018

- Polygons with similar vegetation signatures were ground truthed.



Haley Ross photo

Changing the name from pygmy

- Our work produced rankings for sensitive vegetation types historically known as pygmy forests.
- They are now classified as Mendocino cypress Woodlands and associated vegetation types that occurs “oligotrophic” (nutrient poor) soils..



The majority of the data was collected 2015-18

All of these associations & their alliances are available on CDFW's BIOS website.

The screenshot displays the BIOS website interface. At the top, the URL is <https://map.dfg.ca.gov/bios/?bookmark=3709>. The page header includes the California Department of Fish and Wildlife BIOS logo and navigation buttons for "Basemaps" and "Layers". A search bar contains "Add Data: BIOS" and "Filter by extent". A "Identify Features" button is also visible. The main content area shows the "Active Layer: Vegetation - Mendocino Cypress and Related Vegetation [ds2805]". Below this, a "BIOS Layers" panel lists the "MapClass" for the active layer, including the following associations:

- Hesperocyparis pygmaea Alliance
- Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi - Pinus muricata / Rhododendron macrophyllum Association
- Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi / Rhododendron columbianum Association
- Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi / Rhododendron columbianum FEN VARIANT
- Hesperocyparis pygmaea - Pinus muricata / Arctostaphylos nummularia Association

The map on the right shows the Mendocino region with various creeks (Tate Creek, Russian Creek, Caspar Creek) and parks (Point Cabrillo Light Station SP, Russian Gulch State Park) labeled. A "Table" button is located in the bottom right corner of the map area.

Each association has data tied to polygons on BIOS.

<https://map.dfg.ca.gov/bios/?bookmark=3709>

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE BIOS

Add Data: BIOS Filter by extent Identify Features Advanced Tools

Welcome, guest Login v5.66.18 Help

Active Layer: Vegetation - Mendocino Cypress and Related Vegetation [ds2805]

- Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi - Pinus muricata / Rhododendron macrophyllum Association
- Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi / Rhododendron columbianum Association
- Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi / Rhododendron columbianum FEN VARIANT
- Hesperocyparis pygmaea - Pinus muricata / Arctostaphylos nummularia Association
- Pinus muricata - Chrysolepis chrysophylla / Arctostaphylos nummularia Association
- Pinus muricata - Notholithocarpus densiflorus Provisional Association

Map Scale=1: 18,056 (Zoom level 15)

Table

Vegetation - Mendocino Cypress and Related Vegetation [ds2805] Identified features: 1

Zoom	NVCSName	NVCSLevel	MapClass
1	Hesperocyparis pigmaea - Pinus contorta ssp. bolanderi / Rhododendron columbianum	Association	Hesperocyparis pygmaea - Pinus contorta ssp. bolanderi / Rhododendron columbianum Association

This vegetation classification and mapping project on oligotrophic soils resulted in: six new rare associations within four alliances.

1. Mendocino cypress woodland **Alliance.**
G1/S1
2. Bishop or Monterey pine forests **Alliance.**
G3/S3
3. Glossy leaf manzanita - Golden chinquapin chaparral Shrubland Alliance G2/S2



4. *Redwood forest Alliance.* G3/S3.2



Mendocino cypress Alliance G1/S1

Hesperocyparis pygmaea



Association 1: Mendocino cypress/
Bishop pine/ Ft. Bragg manzanita

Hesperocyparis pygmaea - *Pinus muricata* / *Arctostaphylos nummularia*

620 acres

Mendocino cypress Alliance

G1/S1

Hesperocyparis pygmaea



Association 2: Mendocino cypress/
Bolander pine/Labrador tea

Hesperocyparis pygmaea - *Pinus contorta* var. *bolanderi* /
Rhododendron columbianum

2,029 acres

Mendocino cypress Alliance

G1/S1

Hesperocyparis pygmaea



Association 2: Mendocino cypress/Bolander pine/Labrador tea (**fen variant**)

Hesperocyparis pygmaea - *Pinus contorta* var. *bolanderi* /

Rhododendron columbianum

9 acres

Mendocino cypress Alliance

G1/S1

Hesperocyparis pygmaea



Association 3: Mendocino cypress/Bolander pine/rhododendron

Hesperocyparis pygmaea - *Pinus contorta* ssp. *bolanderi* - *Pinus muricata* /

Rhododendron macrophyllum

2,292

acres

Bishop (or Monterey) Pine

Alliance G3

Pinus muricata or *P. radiata*



Association 4: Bishop pine/chinquapin/

Ft Bragg manzanita G2/S2

1,835

Pinus muricata - *Chrysolepis chrysophylla* / *Arctostaphylos nummularia*

acres

Glossy leaf manzanita - Golden chinquapin chaparral Shrubland Alliance G2/S2

Arctostaphylos (nummularia, sensitiva) - Chrysolepis chrysophylla



Association 5: Chinquapin/huckleberry

(G2/S2) *Chrysolepis chrysophylla* / *Vaccinium ovatum* 55 acres

Glossy leaf manzanita - Golden chinquapin chaparral Shrubland Alliance G2/S2

Arctostaphylos (nummularia, sensitiva) - Chrysolepis chrysophylla



Association 6: Ft. Bragg manzanita

Arctostaphylos nummularia

473 acres

Redwood Alliance S3.2 G3



This **provisional** association does not grow on true oligotrophic soils but has large Mendocino cypress



Association 7 Redwood/Mendocino cypress G1/S1

Collaborative science leads to more effective conservation!

The mapping project would never have been accomplished without the support and leadership of CDFW VegCAMP group in Sacramento, Eureka, Fort Bragg and local and regional **volunteers**. Thirty five people from 14 groups were represented: **No external funding was used!!**



CDFW
CNPS

Botanical consultants
California State Parks
Coastal Commission
Mendocino Land Trust
TNC

Mendocino Redwood Co
Campbell Global Timber
Mendocino Botanical Gardens
CDF
CSUSF
CSC arboretum

Mendocino and other coast cypress alliance

- A report has been completed, the NVC and MCV classifications will combine some of the cypress alliances to Mendocino and other coastal cypress woodland alliance (S1 to S2 ranking)



Names change as we know more

pygmy cypress -> Mendocino cypress



Cupressus goveniana var. “*pigmaea*” (1895) ->*Cupressus pygmaea* (1901) -> *Cupressus goveniana* subsp. *pygmaea* (1914) ->*Callitropsis pigmaea* (2006)-> ***Hesperocyparis pygmaea* (2009)**

February 26, 2018

Mr. Dan Keyes, District Administrator
Mendocino Coast Recreation and Parks District
300 South Lincoln Street
Fort Bragg, CA 95437

Subject:

**PRELIMINARY COMMENTS ON THE PROPOSED MCRPD OHV PARK PROGRAMMATIC EIR
DOROTHY KING YOUNG CHAPTER, CALIFORNIA NATIVE PLANT SOCIETY
PREPARED FOR THE PROJECT SCOPING MEETING, FEBRUARY 28, 2018**

The Dorothy King Young (DKY) Chapter of the California Native Plant Society (CNPS) fully supports land management actions that promote the restoration and protection of native vegetation in California. The DKY Chapter focuses on native plant species and natural habitats that occur within coastal Mendocino County, roughly from the Pacific Ocean to the coastal mountains west of Highway 101. We have read the announcement for the Notice of Preparation and Public Scoping Meeting for the Mendocino Coast Recreation and Parks District's proposed Fort Bragg OHV Park Programmatic EIR, and other background materials that are available on-line that pertain to the project. The DKY Chapter has the following preliminary comments on the proposed project:

ENVIRONMENTAL SIGNIFICANCE OF THE 586-ACRE PROPERTY AND PAST COMMENTS

The vegetation on the 586-acre property consists mainly of two types that are listed as rare by the California Department of Fish and Wildlife (CDFW) (<https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities/List>). These two vegetation types are the *Hesperocyparis pygmaea* (Mendocino pygmy cypress woodland) Alliance G2 S2 and the *Pinus muricata* (Bishop pine forest) Alliance G3 S3. The property may also contain *Lithocarpus densiflorus* (Tanoak forest) Alliance G4 S3, which are areas in which tanoaks dominate the forest stands. CDFW considers vegetation community alliances described under the Manual of California Vegetation, Second Edition (MCV) with State ranks of S1-S3 (limited occurrences and distribution and under threat), and all associations within them to be highly imperiled. In 2016, CDFW began site specific surveys of these rare natural communities on the 586-acre property for the purpose of refining vegetation classification for the Mendocino Coast. Surveys by CDFW, with assistance from local botanical experts, will continue next month (March 2018), and will result in refined descriptions of the Mendocino pygmy cypress woodland and Bishop pine forest. Plant species that are listed as fully protected in California are found within these vegetation types and specifically, on the 586 acres. The highly imperiled and rare "Sholars Bog" is located adjacent to the proposed OHV park property.

Conservation successes

- A proposed OHV park on MCPR land.
- Surveys were done during the Mendocino Cypress Woodland mapping process.
- Letter written by DKY chapter of CNPS



following discussions and information presented during the meeting. We would be happy to work with the MCRPD to offer recommendations on developing other, more appropriate recreational uses for the 586-acre property off of Highway 20.

Respectfully,



Teresa Sholars

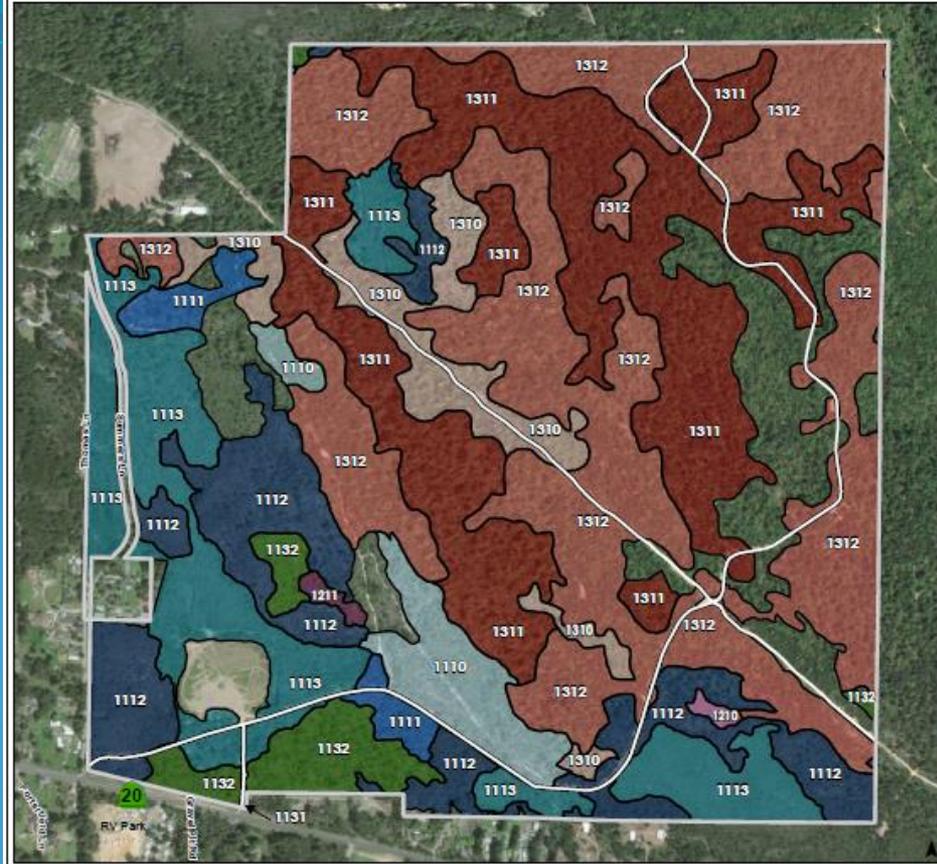
Renée Pasquini, Conservation Co-Chair (North)
Teresa Sholars, Rare Plant Coordinator and Vegetation Chair
Dorothy King Young Chapter, California Native Plant Society

cc: Greg Suba, Conservation Program Director, California Native Plant Society
Jenn Garrison, Sr. Environmental Scientist, California Department of Fish and Wildlife

SNC map of MCPR Hw 20 site

- The data on this map is now on the BIOS site.
- 89% (518 acers) of this site is covered with SNC's
- OHV project not approved by MCPR Board

MCRPD Highway 20 Property
Sensitive Natural Vegetation Communities



Code	Sensitive Natural Community Type	Global and State Ranking	Acres	% of 586 Acres
Chrysolepis chrysophylla Alliance				
1210	Chrysolepis chrysophylla Alliance	G2S2	1.5	0.3
1211	Chrysolepis chrysophylla / Vaccinium ovalum Association	G2S2	1.5	0.3
Hesperocyparis pigmaea Alliance				
1110	Hesperocyparis pigmaea Alliance	G2S2	20.5	3.5
1111	Hesperocyparis pigmaea - Pinus muricata / Arctostaphylos nummularia Association	G2S2	9.7	1.7
1112	Hesperocyparis pigmaea - Pinus contorta ssp. Bolanderi - Pinus muricata / Rhododendron macrophyllum Association	G2S2	65.0	11.1
1113	Hesperocyparis pigmaea - Pinus contorta bolanderi / Rhododendron columbianum Association	G2S2	68.0	11.6
Pinus muricata Alliance				
1131	Pinus muricata - Nothofagaceae densiflorus Association	G3S3	< 0.1	< 0.1
1132	Pinus muricata - Chrysolepis chrysophylla / Arctostaphylos nummularia Association	G2S2	19.7	3.4
Sequoia sempervirens Alliance				
1310	Sequoia sempervirens Alliance	G3S3	28.5	4.9
1311	Sequoia sempervirens - Pinus muricata Provisional Association	G3S3 (Proposed)	129.2	22.1
1312	Sequoia sempervirens - Hesperocyparis pigmaea Provisional Association	G1S1 (Proposed)	173.8	29.7
Sensitive Natural Community Total (rounded)			518	89

NOTE: DRAFT MAP pending finalization of accuracy assessment process.
Finalized map and data to be published in BIOS (WMA Wildlife on gov/data/BIOS) in fall 2018.

Challenges for conservation

- Information for SNC's is hard to find, even if the report and mapping are done.



VegCAMP

- VegCAMP Background
- Reports and Maps 
- Publications, Protocols, and Standards
- Natural Communities
- Submitting Natural Communities Information
- Vegetation-related Resources
- VegCAMP, ACE, BIOS, and CNDDDB Training 



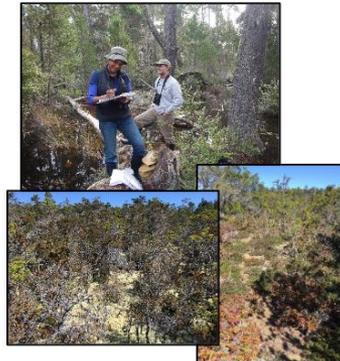
California Department of Fish and Wildlife

Home Fi

Northern California and Sierra Nevada

- Classification of the Vegetation Alliances and Associations of Sonoma County
- Classification of the Vegetation Alliances and Associations of Sonoma County
- Sonoma County Fine Scale Vegetation and Habitat, 2017 (PDF) 
- Classification and Mapping of Mendocino Cypress (*Hesperocyparis pygmaea*) Vegetation on Oligotrophic Soils, Mendocino and Sonoma Counties, California 
- Vegetation Map and Classification of Knoxville Wildlife Area, Napa County, California
- Vegetation Map and Classification of Pine Creek and Fitzhugh Creek Wildlife
- Classification of Modoc and Lassen Counties, California 2021 (PDF) 
- Mapping Standards, Field Data Collection, and Accuracy Assessment for Veg Lassen Counties, California 2021 (PDF) 
- Vegetation Map of a Portion of Modoc and Lassen Counties, California for the (Applegate Field Office) 2021 (PDF) 
- Map of a Portion of Modoc and Lassen County, California for the Bureau of Land Management 2021 (PDF) 
- Vegetation map of Napa Co. using the Manual of CA Vegetation Classification 2004 (PDF) 
- Northern Sierra Nevada Foothills Vegetation Project: Vegetation Mapping Report
- Northern Sierra Nevada Foothills Classification, 2007 – Volume 1 (PDF) 
- Northern Sierra Nevada Foothills Classification, 2007 – Volume 2 (PDF) 
- Vegetation Map and Classification of Slinkard Valley and Little Antelope Valley California 2021 (PDF) 
- Yosemite National Park and Vegetation Classification and Mapping Report, 2011
- Vegetation Classification and Map Accuracy Assessment of the Proposed Tellico River Watershed, Modoc County, California (PDF) 

Classification and Mapping of Mendocino Cypress (*Hesperocyparis pygmaea*) Woodland and Related Vegetation on Oligotrophic Soils, Mendocino and Sonoma Counties, California



California Department of Fish and Wildlife Vegetation Classification and Mapping Program

Authors:

Todd Keeler-Wolf, Diana Hickson, Rosie Yacoub, and Mary Jo Colletti



January 2019

Challenges for conservation

Key to vegetation types of the Mendocino cypress woodland and related vegetation on oligotrophic soils, Sonoma and Mendocino Counties

Class A. Trees are evenly distributed with at least 10% cover unless noted in the key. Understory shrubs and/or herbs may have higher cover than trees = Tree (Woodland / Forest) Vegetation

Class B. Shrubs usually have at least 10% cover and are evenly dispersed. Herbaceous species may have higher cover than shrubs = Shrubland Vegetation

Class A. Tree (Woodland / Forest) Vegetation

1. *Sequoia sempervirens* characteristic (rarely with as little as 5% cover).

***Sequoia sempervirens* Alliance (1310)**

- 1a. *Pinus muricata* is sub- to co-dominant with *Sequoia sempervirens*.

***Sequoia sempervirens* – *Pinus muricata* Provisional Association (1311)**

- 1b. *Hesperocyparis pygmaea* is sub- to co-dominant with *Sequoia sempervirens*.

***Sequoia sempervirens* – *Hesperocyparis pygmaea* Provisional Association (1312)**

2. *Hesperocyparis pygmaea*, *Notholithocarpus densiflorus*, *Pinus attenuata*, *Pinus contorta* ssp. *bolanderi*, and/or *Pinus muricata* characteristic.

- 2a. *Pinus muricata* (or *Pinus attenuata*, see 2a2) dominant, or co-dominant with *Notholithocarpus densiflorus*, in the overstory or regenerating tree layers; *Hesperocyparis pygmaea* not significant in cover.

***Pinus muricata* Alliance (1130)**

- 2a1. *Notholithocarpus densiflorus* and *Pinus muricata* characteristic. If *Pseudotsuga menziesii* shares similar cover with *Pinus muricata* and *Notholithocarpus*, key out here.

***Pinus muricata* – *Notholithocarpus densiflorus* Provisional Association (1131)**

- 2a2. *Pinus muricata* dominant or co-dominant with *Chrysolepis chrysophylla*, and *Arctostaphylos nummularia* characteristic in the understory. *Chrysolepis chrysophylla* may vary in stature from a

- Key to SNC from report.
- Pathway to vegetation maps of vegetation in BIOS

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE BIOS

Add Data: BIOS

Basemaps Layers

Active Layer: Counties

BIOS Layers

Use the 'Add Data: BIOS' input box at top to search for and see list of BIOS datasets. Double click on the list item, or highlight one and hit Enter to add a data layer to the map.

Reference Layers

Remove All Highlights

▼ Geolocation References

+ Cities

- Counties

+ Ecoregion Sections

+ WBD HUC8 Watersheds

+ 24K Quads

+ 24K Quads (New)

+ Zip Codes

+ PLS Sections

+ CDFW Regions

Vegetation - JOHN MUIR NATIONAL HISTORIC SITE [ds908]

Vegetation - Joshua Tree National Park, 2012 [ds730]

Vegetation - Knoxville Wildlife Area [ds2812]

Vegetation - Lassen Foothills [ds564]

Vegetation - Lava Beds National Monument - 2019 [ds285]

Vegetation - Liberty Island, 2012 [ds821]

Vegetation - Lower Santa Clara River [ds983]

Vegetation - Marin County Open Space District [ds957]

Vegetation - Marin Municipal Water District (MMWD) [ds99]

Vegetation - McKenzie Preserve [ds703]

Vegetation - Mecca Hills and Orocopia Mountains [ds2692]

✓ Vegetation - Mendocino Cypress and Related Vegetation [ds1130]

Vegetation - Mid Peninsula Open Space [ds997]

Vegetation - Mill Creek - 2013 [ds1346]

Vegetation - Modoc Plateau - Devil's Garden, Adin Mountain

Vegetation - Modoc Plateau - Shinn, Likely, and Snowstorm

Vegetation - Modoc Plateau Applegate Areas - 2016 [ds28]

Vegetation - Mojave Desert for DRECP - Final [ds735]

Vegetation - Napa County and Blue Ridge Berryessa [ds20]

Vegetation - Napa County Update 2016 [ds2899]

Vegetation - North Coast Range - Mt. Shasta - 2002 [ds1130]

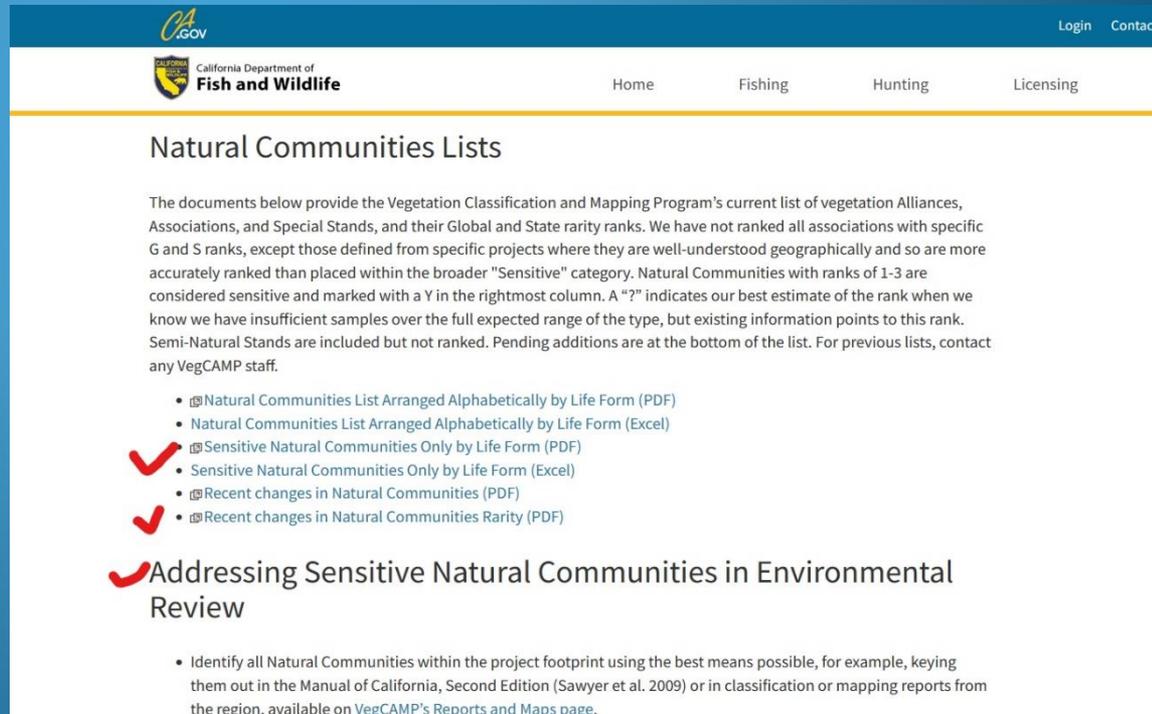
Challenges for conservation

Its important to check CDFW and MCV web sites before writing or reviewing Botanical Surveys! Most SNC's have not been mapped in northwestern Ca.



VegCAMP

- VegCAMP Background
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- Publications, Protocols, and Standards
- ✓ Natural Communities
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CA.GOV

California Department of Fish and Wildlife

Home Fishing Hunting Licensing

Natural Communities Lists

The documents below provide the Vegetation Classification and Mapping Program's current list of vegetation Alliances, Associations, and Special Stands, and their Global and State rarity ranks. We have not ranked all associations with specific G and S ranks, except those defined from specific projects where they are well-understood geographically and so are more accurately ranked than placed within the broader "Sensitive" category. Natural Communities with ranks of 1-3 are considered sensitive and marked with a Y in the rightmost column. A "?" indicates our best estimate of the rank when we know we have insufficient samples over the full expected range of the type, but existing information points to this rank. Semi-Natural Stands are included but not ranked. Pending additions are at the bottom of the list. For previous lists, contact any VegCAMP staff.

- ✓ [Natural Communities List Arranged Alphabetically by Life Form \(PDF\)](#)
- ✓ [Natural Communities List Arranged Alphabetically by Life Form \(Excel\)](#)
- ✓ [Sensitive Natural Communities Only by Life Form \(PDF\)](#)
- ✓ [Sensitive Natural Communities Only by Life Form \(Excel\)](#)
- ✓ [Recent changes in Natural Communities \(PDF\)](#)
- ✓ [Recent changes in Natural Communities Rarity \(PDF\)](#)

✓ Addressing Sensitive Natural Communities in Environmental Review

- Identify all Natural Communities within the project footprint using the best means possible, for example, keying them out in the Manual of California, Second Edition (Sawyer et al. 2009) or in classification or mapping reports from the region, available on VegCAMP's Reports and Maps page.

Questions and Answers

