The Underpinnings of Natural Community Ranking:
A Presentation to Coastal Commission
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Main points:

- Describe the classification of vegetation / natural communities

- Explain meanings and significance of community ranks

- Define rarity ranking process for California Rare Natural Communities

- Discuss examples for the coastal zone

Dudleya (cymosa) – Lichen/Moss Sparse Herbaceous Alliance, Middle Anacapa Island

A Brief History of NC ranking in California

- CNDDB Natural Community shop first started based on Cheatham and Haller (1975) in 1983 (ca. 170 types)
- Expanded to Holland classification (1986-1995) [240 types]

1. Based upon descriptive *ad hoc* categories and not well-suited for unambiguous definitions (square pegs)
2. Accumulated information primarily by incidental input
3. Ranking done by expert opinion (qualitative)

- Began to translate to MCV/National Classification in 1996 at alliance level (280 alliances)
- Vegetation programs in CDFW and CNPS started in 1999-2000
- Revised through MCV2 (Sawyer et al., 2009), ongoing through DFW/CNPS Vegetation Programs and the US National Vegetation Classification
  - as of 2016 there are 500 alliances and ca. 2000 associations (all alliances ranked, most associations ranked at least basically into "rare or not")

1. Quantitative, defensible definitions. Inductive classification refinement
2. Complete "wall-to-wall" information wherever new classification and mapping projects are undertaken
3. Rank calculation (as of 2012) done using rules and point weightings based on conservation factors. There is a backlog.

How is vegetation classified in California?

- The classification has evolved from a functional, but anecdotal community approach (the Holland system) in the mid-1980's to mid-1990's

- Now based on quantitatively driven National Vegetation Classification with well-defined 8-level hierarchy

- Measurable differences in species composition, structure, and landscape conditions are important to define the various levels and components of rarity ranking

- At which level do we address community rarity?
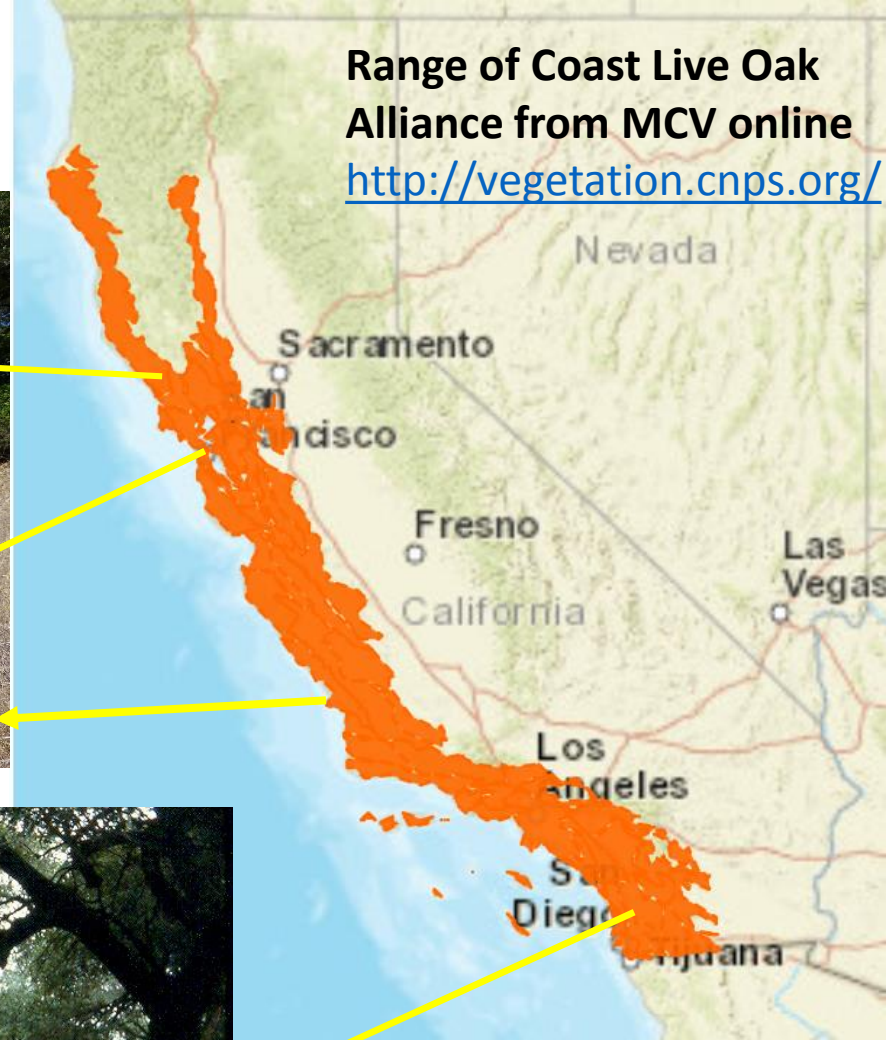   - Alliance and Association levels (floristic, geographically specific)
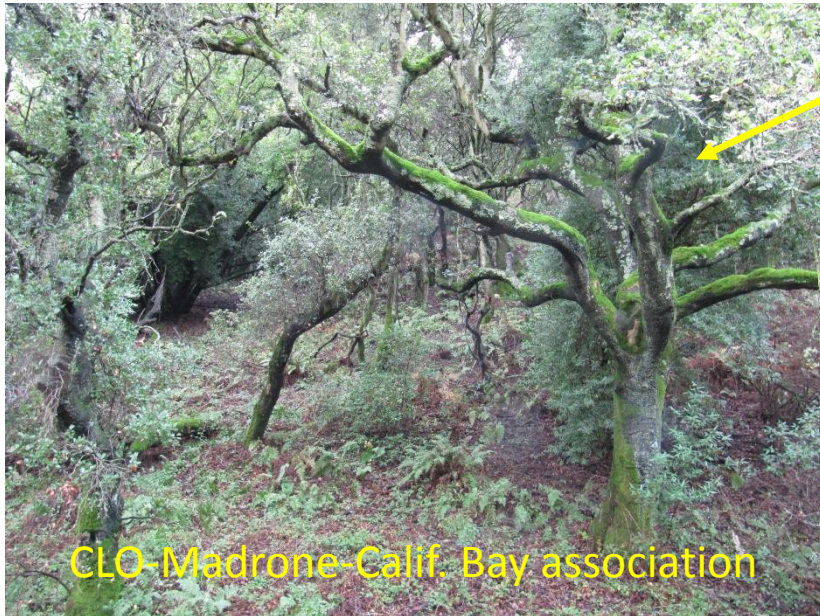
Example: Associations of Coast Live Oak Alliance:

Range of Coast Live Oak Alliance from MCV online
http://vegetation.cnps.org/

CLO/Poison-oak association

CLO/Grass (annual) Association

CLO-Madrone-Calif. Bay association

CLO-Arroyo willow association

Each association has its own distribution, and rarity characteristics

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# The Basis for Describing Vegetation (Natural Communities)

- Each vegetation unit is defined and described by sampling a group of **stands**

- with a common growth form and a **constant** set

- of **diagnostic** species

- including characteristic species of the **dominant** growth form,

- sharing a similar set of regional edaphic (soils), topographic, and disturbance factors.

Stands: the fundamental unit of vegetation classification

Have homogeneous plant species composition and vegetation structure with:

- A limited array of plant species and life-forms ordered by local environment including:
  - Limiting factors of moisture, temperature, exposure, soils and nutrition.
  - Historic dynamic natural processes such as fire, flood, storms, and disease.

Chaparral

Oak woodland

Coastal sage scrub

Savanna-grassland
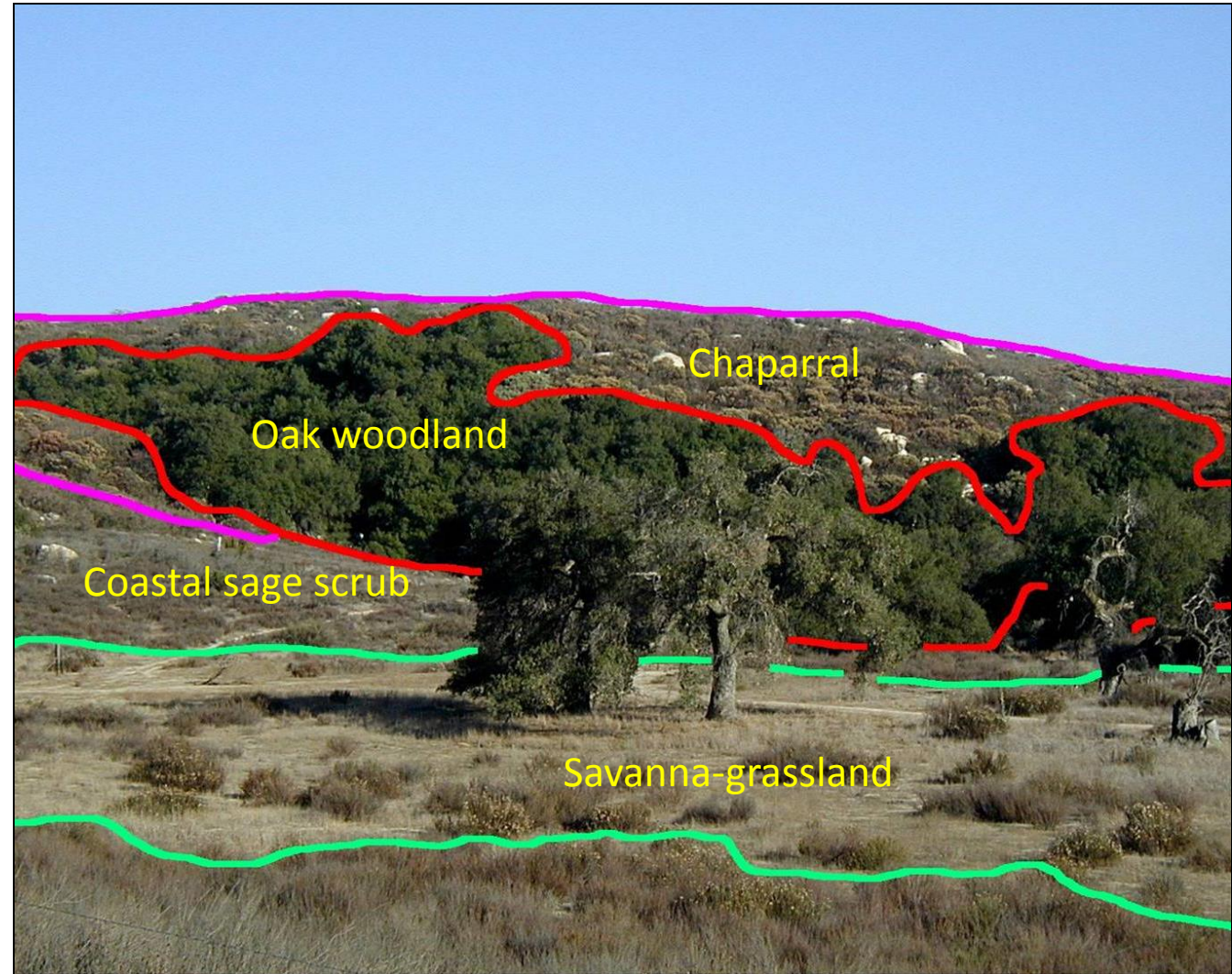
Dominance

- **Dominant species** — Species with the highest percent cover, usually in the uppermost dominant layer. Visually obvious, highest cover or biomass

Bishop Pine (*Pinus muricata*), locally dominant along the N. coast of California

Constancy — the percentage of sample plots in a given data set in which a species occurs

- **Constant (species)** —a species that occurs frequently in stands of a type
  - Constancy has been set at different levels for different studies (usually greater than 70% for alliances and associations).

**Lemonade-berry (*Rhus integrifolia*) Association** (n=14)

Lifeform	Species Name	Con	Avg	Min	Max
Shrub					
	Rhus integrifolia	100	48.2	14.0	85
	Artemisia californica	86	4.8	0.2	20
	Heteromeles arbutifolia	64	4.2	0.2	20
	Diplacus aurantiacus ssp. aurantiacus	64	1.4	0.2	8
	Salvia mellifera	57	2.9	0.2	9
	Malosma laurina	50	5.3	0.2	13
	Encelia californica	43	0.8	0.2	3.20
	Xylococcus bicolor	36	3.9	0.2	10
	Opuntia littoralis	29	2.1	0.2	5
	Rhamnus crocea	29	0.4	0.2	1
	Eriogonum fasciculatum	21	1.7	0.2	4
	* *Nicotiana glauca*	21	0.5	0.2	1
	Ribes speciosum	21	0.5	0.2	1
	Sambucus nigra ssp. cerulea	21	0.5	0.2	1
Herb					
	* *Bromus madritensis*	43	3.4	0.2	8
	Marah macrocarpus var. macrocarpus	36	0.9	0.2	2
	Nassella lepida	29	1.1	0.2	3
	Leymus condensatus	29	1.1	0.2	2
	* *Centaurea melitensis*	29	0.4	0.2	1
	* *Foeniculum vulgare*	21	0.2	0.2	0.20

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Diagnostic species

Agave shawii at Pt Loma, San Diego Co.

- **Diagnostic species** — any species or group of species whose relative constancy or abundance differentiates one vegetation type from another.
  - A plant whose presence serves as a criterion of recognition of that community.
  - Based on predictable presence, persistence, and fidelity to restricted type(s) of vegetation
  - Diagnostic species are identified through statistical multivariate analysis, which relies on some measure of similarity/difference between vegetation samples.

Data is analyzed using cluster analysis and ordination, and summarized to develop descriptions
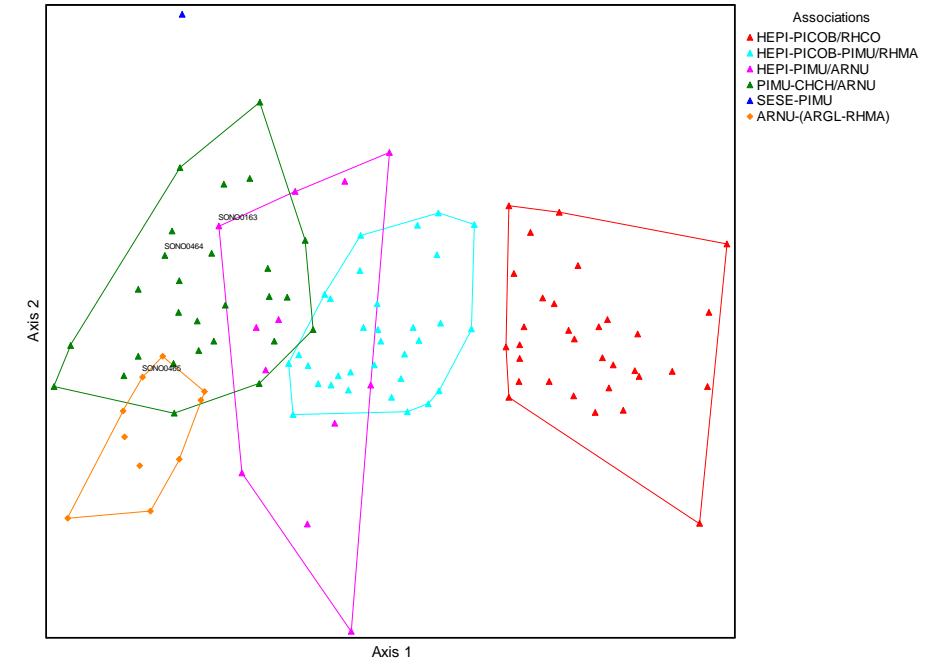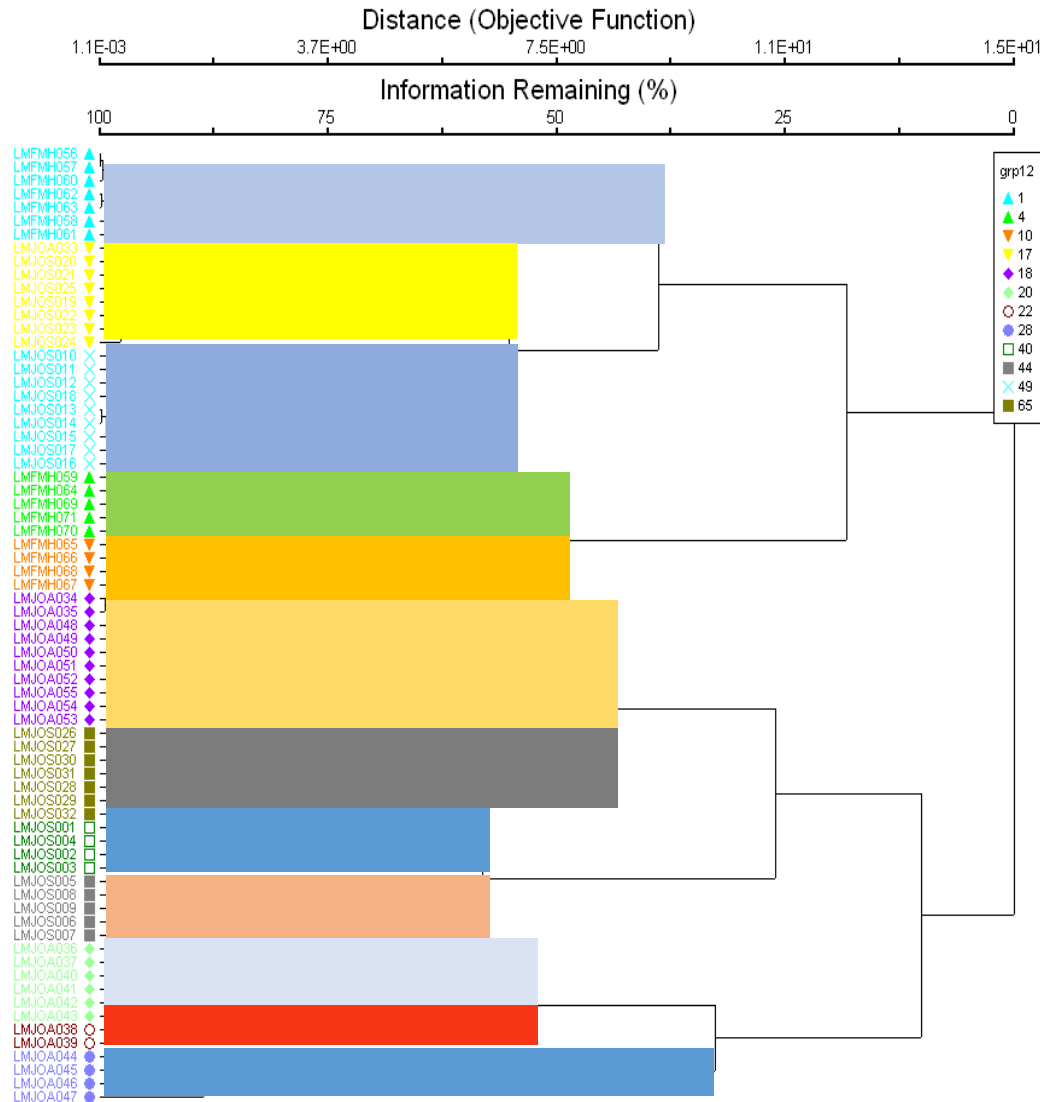
- Each of the groupings identified in this dendrogram should have one or more species that characterize the grouping.
- these become the diagnostic species listed in the specific name of a vegetation community.

Purple needlegrass [*Stipa (Nassella) pulchra]:* constant but not always dominant in stands

Dense stand, *S. pulchra* dominant

Diverse coastal stand, *S pulchra* sub-dominant

Nassella pulchra-Melica californica-Annual grass Association

Stratum Herb	Code	Species Name	Con	Avg	Min	Max
	NAPU4	*Nassella pulchra*	100	4.7	1	7
	MECA2	*Melica californica*	100	4.3	1	10
	BRHO2	*Bromus hordeaceus*	86	15.0	10	27
	AVBA	*Avena barbata*	71	5.4	1	15
	CAPY2	*Carduus pycnocephalus*	71	1.4	1	5
	BRDI3	*Bromus diandrus*	57	5.1	5	18
	ESCA2	*Eschscholzia californica*	57	0.8	0.2	4
	AICA	*Aira caryophyllea*	57	0.6	0.2	2
	LUBI	*Lupinus bicolor*	57	0.1	0.2	0.2
	TRDE	*Trifolium depauperatum*	43	0.1	0.2	0.5
	BRMA	*Briza maxima*	29	3.5	0.2	24
	HYGL2	*Hypochaeris glabra*	29	2.9	0.2	20
	TRBA	*Trifolium barbigerum*	29	1.3	2	7
	FEID	*Festuca idahoensis*	29	0.7	0.2	5
	ERBO	*Erodium botrys*	29	0.5	0.2	3
	CHPO3	*Chlorogalum pomeridianum*	29	0.3	0.2	2
	LOPE	*Lolium perenne*	29	0.3	1	1
	MAGR3	*Madia gracilis*	29	0.3	1	1
	PLNO	*Plagiobothrys nothofulvus*	29	0.3	1	1
	ACMI2	*Achillea millefolium*	29	0.2	0.2	1
	ELGL	*Elymus glaucus*	29	0.2	0.2	1
	SABI3	*Sanicula bipinnatifida*	29	0.2	0.2	1
	TRBI	*Trifolium bifidum*	29	0.2	0.2	1
	VUMI	*Vulpia microstachys*	29	0.2	0.2	1
	ANAR	*Anagallis arvensis*	29	0.1	0.2	0.5
	SIMA2	*Sidalcea malviflora*	29	0.1	0.2	0.5
	AMME	*Amsinckia menziesii*	29	0.1	0.2	0.2
	DAPU3	*Daucus pusillus*	29	0.1	0.2	0.2
	RACA2	*Ranunculus californicus*	29	0.1	0.2	0.2
	SIBE	*Sisyrinchium bellum*	29	0.1	0.2	0.2
	STAJ	*Stachys ajugoides*	29	0.1	0.2	0.2
	TRPU16	*Triphysaria pusilla*	29	0.1	0.2	0.2

Weighted factors considered in ranking natural communities:

Rarity

Range, Extent
Area of Occupancy
# of Occurrences (e.g. mapped stands)
# of Occurrences with Good Viability/Ecological Integrity (stands of high quality)
Percent Area with Good Viability/Ecological Integrity
*Environmental Specificity -*used if # of Occurrrences & Area of Occupancy are Unknown.*

Guidelines for Rarity Ranks

G1 S1: Fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares

G2 S2: 6–20 viable occurrences worldwide/statewide, and/or more than 518–2,590 hectares

G3 S3: 21–100 viable occurrences worldwide/statewide, and/or more than 2,590–12,950 hectares

G4 S4: Greater than 100 viable occurrences worldwide/statewide, and/or more than 12,950 hectares

G5 S5: Demonstrably secure because of its worldwide/statewide abundance

Threats

Overall Threat Impact
*Intrinsic Vulnerability - *Only used if Overall Threat Impact is Unknown or Null*

Pervasive = Affects all or most (71-100%) of occurrences
Large = Affects much (31-70%) of occurrences
Restricted = Affects some (11-30%) occurrences
Small = Affects a small proportion (1-10%) of occurrences

Trends (only if repeat monitoring)

Short-term Trend 10-100 yrs.

Robustness of Rarity Ranks:

- Rarity- determined by range/distribution; grouped into 10 classes
- Rarity- determined by abundance and condition of occurrences (7 classes from 0->300)
- Viability/ecological integrity (most restrictive of these are ranked into 6 classes from fewest to most numerous in high condition)
- Threats <u>scope</u> (high to low; 4 categories) and <u>severity</u> (extreme to neutral or beneficial)
- Trends assessed with 20 yr. time frame for natural communities (not widely applied to vegetation in CA)
- There are ways to calculate G and S ranks without complete knowledge of:
  - number of occurrences and area of occupancy (based on environmental specificity)
  - Intrinsic vulnerability (threats and general trends)

How do we establish the rarity of a vegetation type?

- Identify types of vegetation through sampling and analysis in specific studies such as vegetation mapping projects
- Estimate extent of the type and refine through additional studies throughout its range
- Acreage and number of occurrences are quantified through detailed mapping of occupied areas
- Use G and S ranking rules with threat modifiers

Descriptions of vegetation types come from detailed studies such as the Santa Monica Mountains NRA
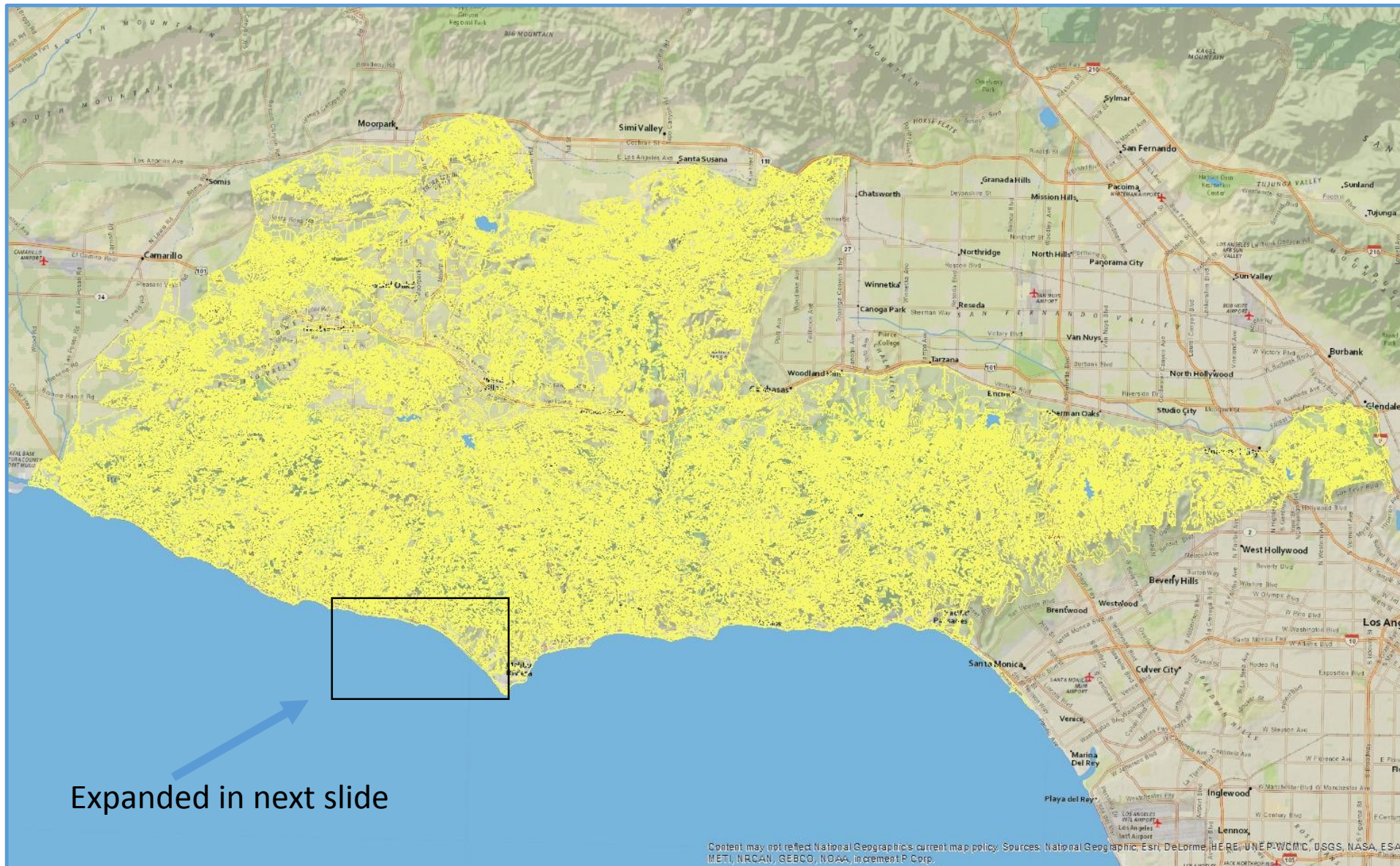
Expanded in next slide

All vegetation types are defined and delineated in a standard way based on rules of classification giving wall-to-wall representation in the project area

Project mapping represents rare communities along side more common ones and enables accurate estimates of acreage and abundance

Rare Natural Communities of the Coastal Santa Monica Mountains

Legend

Santa_Monica_Mountains_NRA

<all other values>

NVCSName

- Coreopsis gigantea
- Encelia californica
- Eriogonum cinereum
- Juglans californica
- Leymus condensatus
- Opuntia littoralis
- Platanus racemosa
- Rhus integrifolia
- Sarcocornia pacifica (Salicornia depressa)

NatGeo_World_Map

Current Extent of Vegetation Assessment in California

#	Name
0	Devil's Postpile NM
1	Redwood NP
2	Pine and Fitzhugh Creeks WLAs (CDFW)
3	Whiskeytown-Shasta NRA
4	Lassen foothills
5	Lassen NP
6	Sierra Nevada Foothills-North
7	Napa County and Blue Ridge Berryessa
8	Pt. Reyes and Golden Gate NRA
9	Marin Municipal Water District
10	Midpeninsula Regional Open Space District-Peninsula Open Space Trust
11	John Muir NHS
12	Suisun Marsh
13	Sacramento-San Joaquin River Delta
14	Central Valley Riparian Project and Eastern Sacramento Valley-Alliance Level
14	Central Valley Riparian Project-Group Level
15	Peoria WLA (BOR)
16	Yosemite NP
17	Gablian Ranch
18	San Benito River
19	Pinnacles NM
20	Salinas River
21	Clear Creek Managment Area
22	Sequoia and Kings Canyon NP
23	Central Moiave Desert
24	Carrizo Plain ER (CDFW)
25	Carrizo Plain NM (BLM)
26	Santa Clara River Parkway
27	Santa Cruz Island
28	Santa Monica Mountains NRA
29	Ballona Wetlands
30	Palos Verdes
31	Western Riverside County
32	Joshua Tree NP
33	Western San Diego Co.
34	San Dieguito River Parkway
35	San Felipe WLA (CDFW)
36	Anza-Borrego SP
37	Oak Grove (CDFW)
38	Vegetation Map in Support of the DRECP
38	Vegetation Map in Support of the DRECP
38	Vegetation Map in Support of the DRECP
39	Channel Islands
40	Sonoma County
41	Eastern Sacramento Valley Natural Vegetation
42	Garcia River
43	Santa Lucia Preserve
44	Fish Slough
45	Mojave Desert National Preserve
46	Death Valley NP
47	Carrizo CDFW Extension
48	Lava Beds NM
49	West Sacramento Valley Natural Vegetation
50	Orange County
51	Western Riverside County remap
52	Cabrillo NM
53	Liberty Island Remap
54	Southern San Joaquin Valley Habitat Linkage
56	Southern Sierra Nevada Foothills
57	Canada de San Vicente
58	Marin County Open Space District
59	Vegetation for the DRECP Rice Valley extension
60	Manzanar NHS
61	Proposed Tehachapi Pass High Speed Rail Corridor Vegetation Map
62	Knoxville WLA (CDFW)
63	Johnson Valley Integrated Mapping
64	Ciervo Panoche North
65	Western Madera County
66	McKenzie Preserve at Table Mountain
67	San Nicolas Island
68	Mill Creek
69	Cow Creek
70	Vegetation for the DRECP Silurian Valley Soda Mtns. Mesquite Lake extension
71	Vegetation for the DRECP Rice Valley extension 2
72	Vegetation for the DRECP Chuckwalla Bench - Southern Imperial Co. extension
73	Canada de los Osos ER (CDFW)
74	Eastern San Joaquin Valley
75	San Joaquin River Restoration Program
76	Pygmy Forest mapping
77	Vegetation Mapping of Peninsular Bighorn Sheet Habitat
78	Vegetation for the DRECP Imperial Co. module 4 extension
79	Vegetation for the DRECP Whipple Mtns. module 4 extension
80	Vegetation for the DRECP Cadiz Valley module 4 extension
81	Vegetation for the DRECP 29 Palms module 4 extension
82	Point Mugu Naval Air Station
83	Great Valley Extension
84	Likely, Shinn, and Snowstorm Mountains

Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA, USGS The National Map: National Boundaries Dataset, Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Data, Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line; HERE Road Data

Eriogonum cinereum **Shrubland Association**

Ashy Buckwheat Shrubland Association
Eriogonum cinereum **Shrubland Alliance**
Ashy Buckwheat Shrubland Alliance

Mapping Code: 3257

Local Description

Summary:
This shrubland association occurs on moderate to abrupt southwest-facing slopes at low elevations between 0–500 m. It is characterized by a dominance of *Eriogonum cinereum* in the shrub layer. The herbaceous layer has no characteristic species. The emergent tree layer is generally absent but can include *Quercus agrifolia* and *Umbellularia californica*.

Distribution:
This association is sampled in the Dry Inland, Upper Elevation Santa Monica Mountains, Western Fog Zone, Immediate Coast, and Lower Elevation Inland Santa Monica Mountains regions of the study area.

Environmental Description:
Elevation: range 0–500 m, mean 289.5 m
Aspect: southwest
Slope: range 9–80 degrees, mean 35.6 degrees
Topography (micro; macro): undulating, flat, or convex; lower to upper slope
Litter Cover: range 10–35%, mean 16.7%
Small Rock Cover: range 3–46%, mean 23.1%
Large Rock Cover: range 0–85%, mean 17.1%
Bare Ground: range 0–65%, mean 27.8%
Parent Material: sedimentary
Soil Texture: moderately fine clay loam

Vegetation Description:
Stands of *Eriogonum cinereum* Shrubland form an open to intermittent shrub layer (3–37%, mean 18.5%). Shrubs occur in two different strata with low shrubs at 0–2 m tall and tall shrubs at 0–5 m tall. The herbaceous layer is open (0–33%, mean 10.7%) at 0–2 m tall. Trees are occasionally emergent (0–2% cover, mean 0.1%) with hardwoods at 0–10 m tall. Total vegetation cover is 6–47%, mean cover is 29.2%.

In this association, the shrub layer is characterized by *Eriogonum cinereum*. *Artemisia californica* is usually present. *Yucca whipplei, Salvia mellifera, Malosma laurina,* and *Lotus scoparius* are occasionally included in this layer. The tree layer is emergent and open and may infrequently include *Quercus agrifolia* at low cover. The herbaceous layer is diverse and sometimes includes *Brassica nigra, Centaurea melitensis, Bromus madritensis, Leymus condensatus, Bromus diandrus,* and *Hirschfeldia incana*.

Samples Used in Description: (n = 48)
AA0016cc, AA0276cc, AA0504, AA0624, AA0743cc, AA0750cc, AA0858, AA0954, AA1159, AA1161, AA1175, rap0073, rap0093, rap0137, rap0161, rap0389, rap0390, rap0420, rap0463, rap0499, rap1249, rap1250, rap1302, rap1323, rap1367, rap1389, rap1391m, rap1711, rap1722, rap1741, rap1800, rap1804, rap1813, rap1814, rap1819, rap1872, rap1877, rap1927m, rap1947, rap1995, rap1996, rap2000m, rap2127, rap2128, rap2200, rap2586, rap2713, rap2722

Comments:
This is an endemic alliance and association to the Ventura region of California and probably has most of its area represented within the SAMO study area. It is characteristic of steep usually southerly facing slopes below 600 m elevation and is often found on rocky or eroded cliffs. An early seral (postfire) phase has been identified with a higher cover of *Malacothamnus fasciculatus* and *Leymus condensatus*.

CONSERVATION STATUS RANK   G3S3

Global Description

Distribution:
This association is only known from the Santa Monica Mountains region. Information about its global distribution is not available without additional inventory.

**Nations:**
United States

States or Provinces:
CA

Eriogonum cinereum **Association**

Layer	Code	Species Name	Con	Avg	Min	Max	A	C	N
Shrub									
	ERCI5	*Eriogonum cinereum*	98	10.9	0.2	25.0	X		
	ARCA11	*Artemisia californica*	71	1.5	0.2	8.0			
	SAME3	*Salvia mellifera*	38	0.4	0.2	5.0			
	YUWH	*Yucca whipplei*	38	0.2	0.2	2.5			
	LOSC2	*Lotus scoparius*	35	1.0	0.2	24.0			
	MALA6	*Malosma laurina*	35	0.7	0.2	6.0			
	SALE3	*Salvia leucophylla*	31	0.6	0.2	10.0			
	ENCA	*Encelia californica*	23	0.4	0.2	4.0			
	BRCA3	*Brickellia californica*	21	0.3	0.2	2.5			
	HEAR5	*Heteromeles arbutifolia*	21	0.2	0.2	2.5			
	RHOV	*Rhus ovata*	21	0.2	0.2	3.0			
Herb									
	BRNI	*Brassica nigra*	50	1.6	0.2	12.0	X		
	CEME2	*Centaurea melitensis*	38	1.8	0.2	15.0	X		
	BRMA3	*Bromus madritensis*	31	1.3	0.2	20.0	X		
	LECO12	*Leymus condensatus*	25	0.8	0.2	12.0			
	HIIN3	*Hirschfeldia incana*	21	0.7	0.2	15.0	X		
	BRDI3	*Bromus diandrus*	21	0.7	0.2	8.0	X		
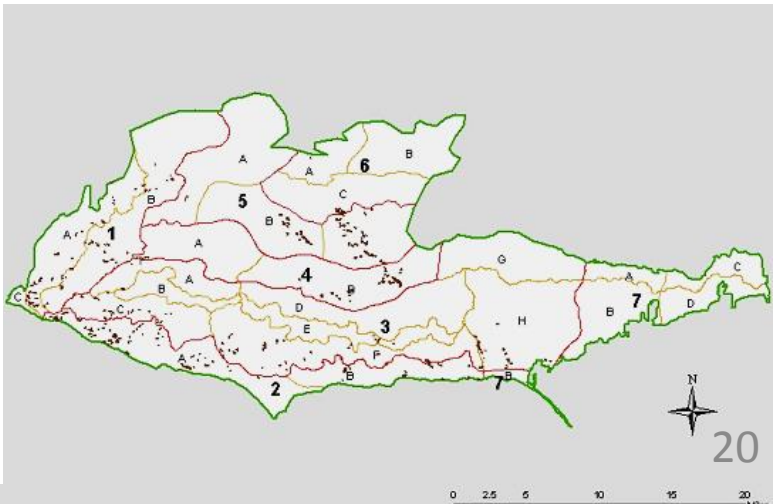
Expression of *Eriogonum cinereum* vegetation in Santa Monica Mountains

Step 2: Extrapolate range from existing data on diagnostic species ; e.g., Botanical Collections of *Eriogonum cinereum*
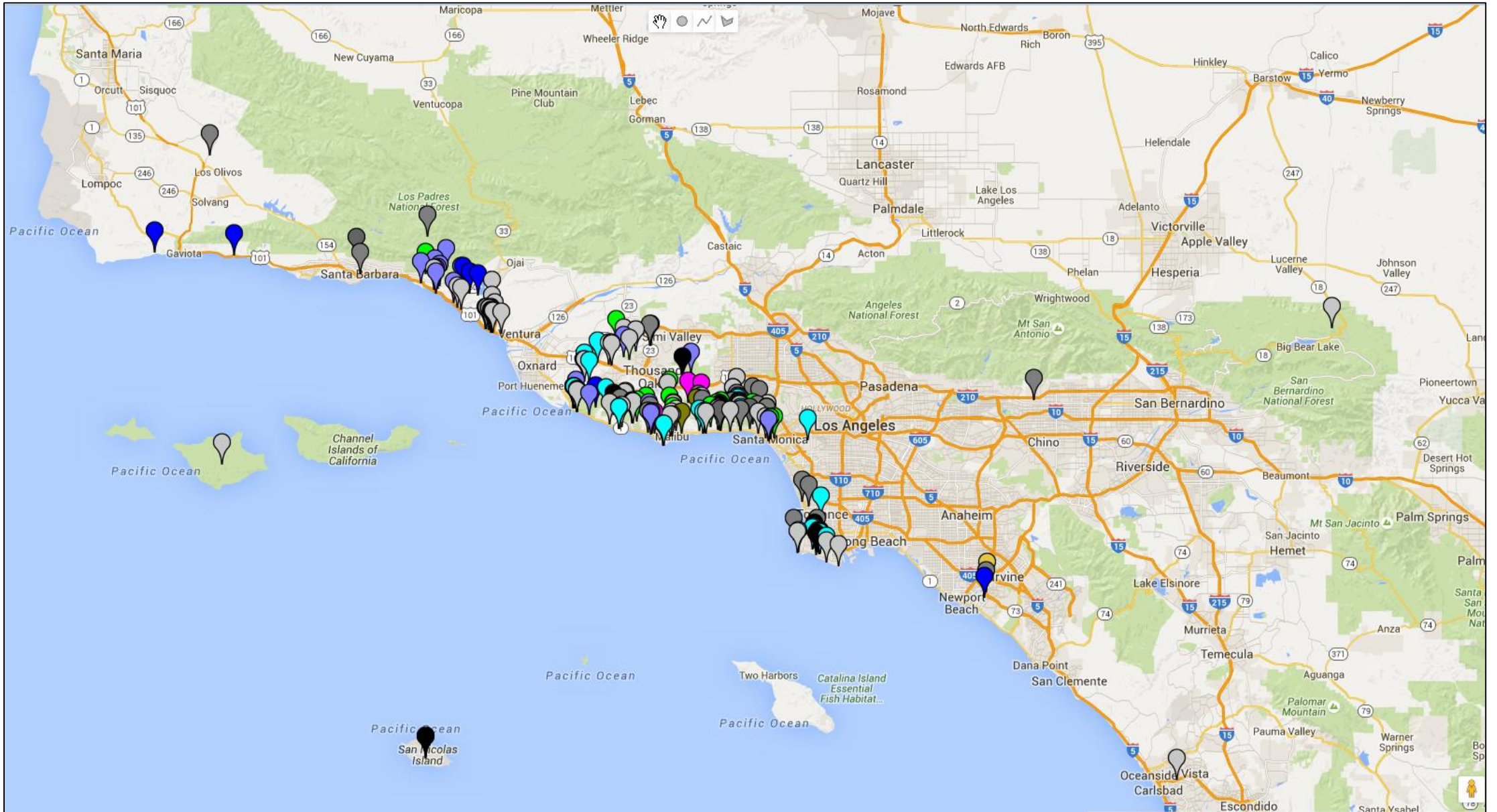
Consider "occupied area":
Much of coastal southern California is urban and unoccupied by any natural vegetation

Report general ecological range of *Eriogonum cinereum* association and alliance (as shown in MCV2 online). Assume it is broader than current actual vegetation occupancy.

Total number of stands and acreage known as of description:

Count: 350
Minimum size: 0.32
Maximum: 36.57
Sum: 924.21
Mean: 2.64

Total estimated range un-sampled: 66%

2010 estimate: *Eriogonum cinereum* Ashy buckwheat scrub Alliance G3? S3?

Step 3: Assessing ecological integrity and threats- new information

- New mapping shows Palos Verdes *Eriogonum cinereum* vegetation occurrences aren't high-rated.

- All are fragmented and surrounded by development, but these stands are southern-most known, ecologically significant, and some protected

- Also throughout range fountain-grass is a threat in some stands

- moderate threats to about 25% of known stands

Step 2: Refinement of distribution and rarity from other detailed vegetation maps.

??

Well-understood

No occurrences

Refined Rarity rank to be officially posted later this year:

G2?S2.2? Changed from G3S3 first posted 2010
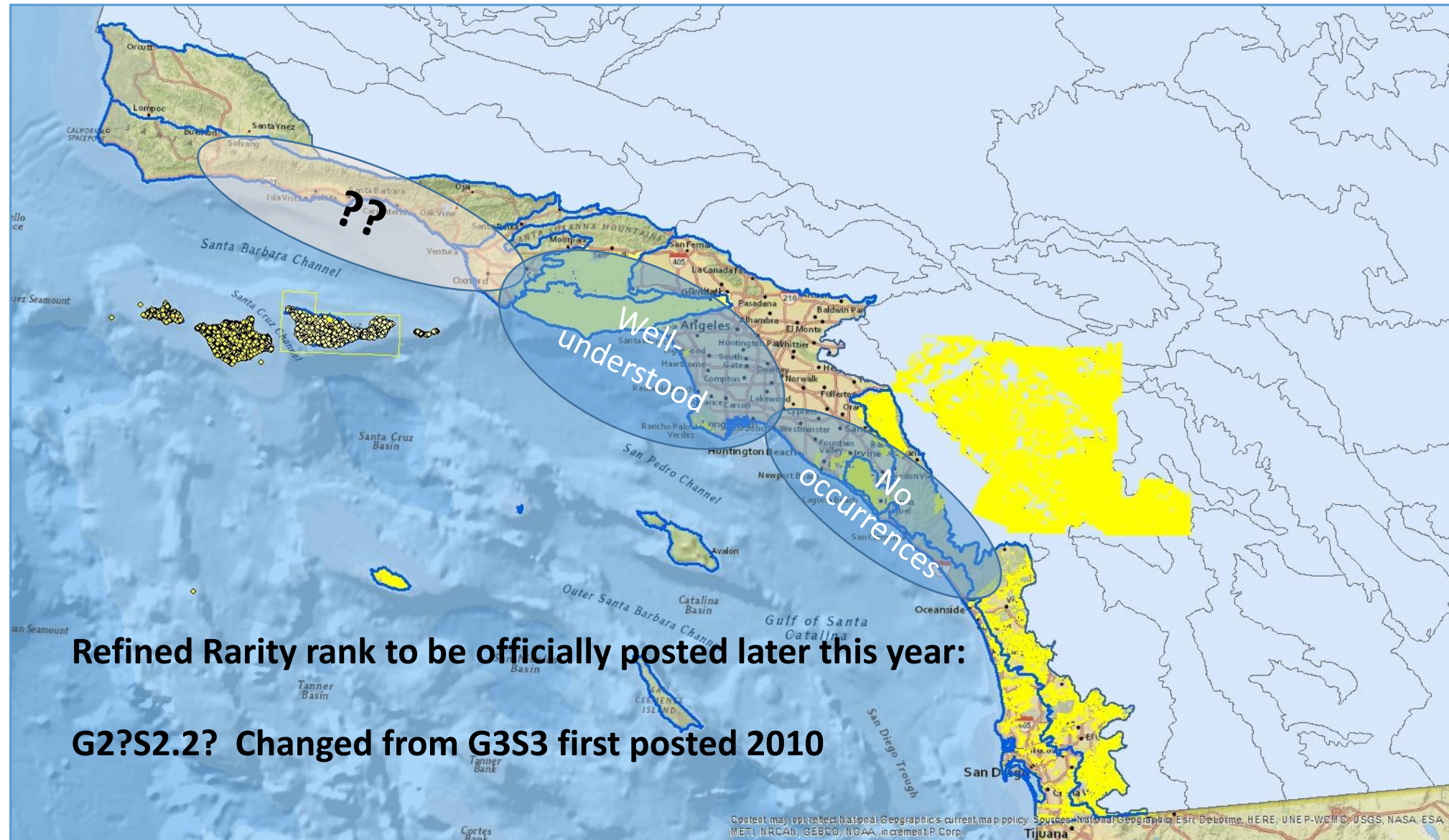
An example of existing site quality: Non-native species composition in *Nassella pulchra* South Coast Association (n=19)

- RANK G3 S3.2

  - Diagnostic species only from 2-25% cover.

  - Sometimes the non-native species are higher cover than the natives

  - Non-native plant relative cover proportion: 64%

  - Half of the top constant species are non-native,

  - This is the <u>norm</u> for this community today

  - Quality is assessed more by size and "edge-effects", than % native cover

Lifeform	Code	Species Name	Con	Avg	Min	Max	Diagnostic
Shrub							
	ISME5	*Isocoma menziesii*	53	1.0	0.2	3	
	ERFA2	*Eriogonum fasciculatum*	53	0.3	0.2	1	
	ARCA11	*Artemisia californica*	32	0.6	0.2	2	
	BASA2	*Baccharis sarothroides*	26	0.7	0.2	2	
	LOSC2	*Lotus scoparius*	21	2.1	0.2	5	
	MALA6	*Malosma laurina*	21	1.9	0.2	5	
Herb							
	NAPU4	Nassella pulchra	100	9.7	2.0	25	X
	BRMA3	* *Bromus madritensis*	47	6.1	0.2	20	
	BRHO2	* *Bromus hordeaceus*	47	3.6	0.2	18	
	CASP	*Calochortus splendens*	47	0.7	0.2	2	
	CEME2	* *Centaurea melitensis*	47	0.5	0.2	2	
	ERBO	* *Erodium botrys*	42	19.4	2.0	70	
	BRDI2	* *Brachypodium distachyon*	42	9.8	0.2	22	
	BRDI3	* *Bromus diandrus*	42	9.8	0.2	38	
	AVBA	* *Avena barbata*	42	5.1	0.2	18	
	SIBE	*Sisyrinchium bellum*	37	0.8	0.2	3	
	HIIN3	* *Hirschfeldia incana*	37	0.5	0.2	2	
	AVFA	* *Avena fatua*	32	16.5	0.2	30	
	VUMY	* *Vulpia myuros*	32	5.3	0.2	20	
	LOPEM2	* *Lolium perenne ssp. multiflorum*	32	4.2	0.2	19	
	AMPS	*Ambrosia psilostachya*	32	2.1	0.2	10	
	CYCA	* *Cynara cardunculus*	26	4.3	0.2	18	
	DISP	*Distichlis spicata*	26	4.2	0.2	8	
	HEFA	*Deinandra fasciculata*	26	0.7	0.2	2	
	BLCRC	*Bloomeria crocea var. crocea*	21	4.3	0.2	8	
	HYGL2	* *Hypochaeris glabra*	21	1.9	0.2	5	
	COFI2	*Corethrogyne filaginifolia*	21	1.4	0.2	3	
	ERCI6	* *Erodium cicutarium*	21	1.4	0.2	4	
	DICA14	*Dichelostemma capitatum*	21	0.7	0.2	2	

Summary plot and classification data leads directly into identification: *Stipa pulchra* key differences for Orange County Vegetation:

19. Vegetation is **dominated** or **characterized** by a mixture of native perennial grasses and annuals in upland settings, ***with the native grasses and forbs usually making up >10% relative cover of the herbaceous layer***. Non-native herbaceous species may have a significant presence, but are **not considered diagnostic as they are ubiquitous across the study area**.

19a. ***Stipa pulchra*** characterizes stands alone or in shared dominance with other native and non-native grasses and forbs. A variety of emergent shrubs may be present.

***Stipa pulchra* Association**

19b. ***Stipa lepida*** characterizes stands alone or in shared dominance with other native and non-native grasses and forbs. A variety of emergent shrubs may be present.
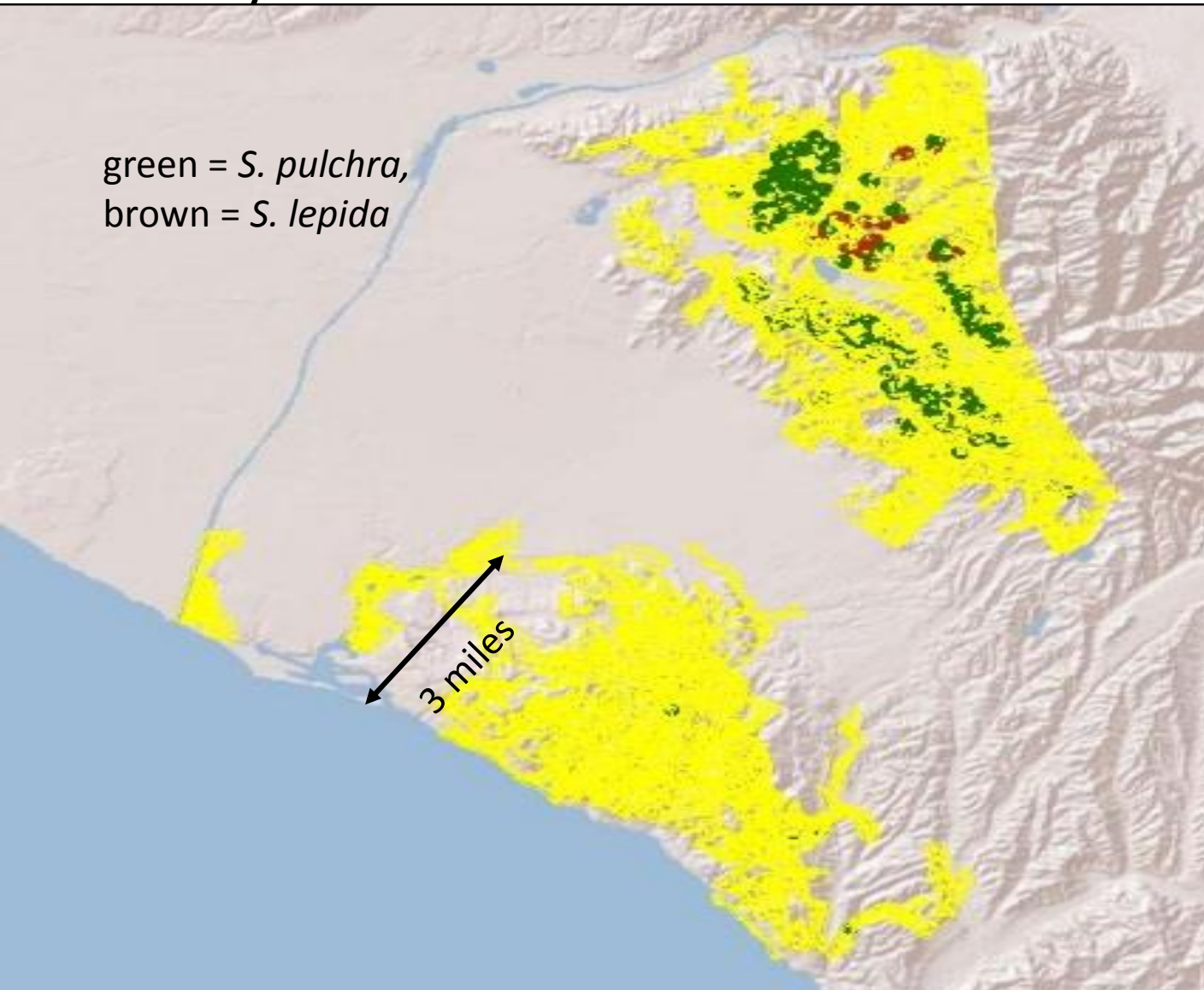
***Stipa lepida* Association**

What is the threshold between native and non-native grassland?

- Herbaceous vegetation **strongly** **dominated by non-native grasses and** **forbs** such as *Avena, Brachypodium, Brassica, Briza, Bromus, Centaurea, Cynosurus, Danthonia pilosa, Erodium, Lolium, Raphanus* and *Stipa manicata*. **Native herbaceous species have** **insignificant cover in stands,** **especially** **during the active growing season**. Stands are found in foothills, rangelands, fallow fields, woodland openings, riparian areas, and disturbed settings.

- **Mediterranean California Naturalized** **Annual and Perennial Grassland Group**
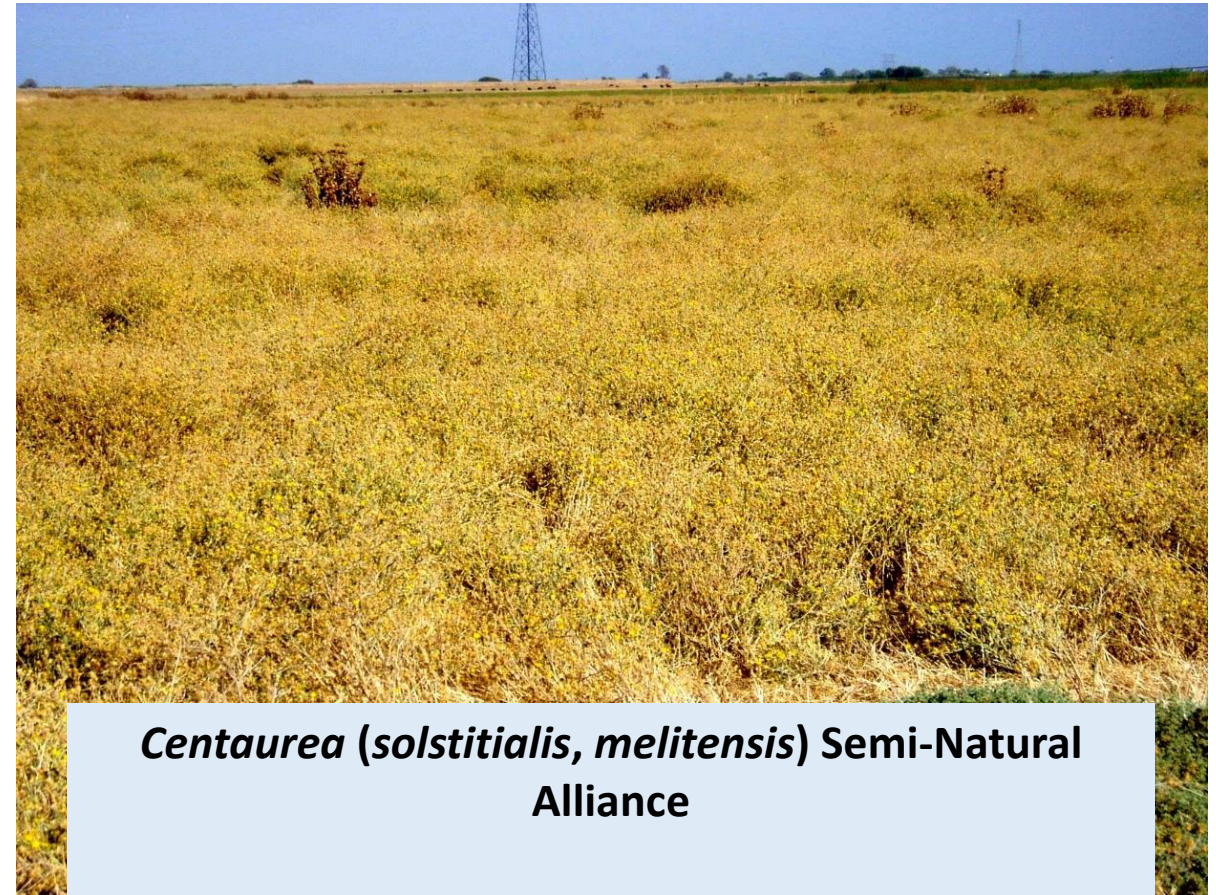
Centaurea (*solstitialis, melitensis*) Semi-Natural Alliance

Statement from key to vegetation in recent guide to Sonoma County Vegetation (2015)

Needlegrass *(Stipa* sp.) grassland mapping in Orange County: Can it be trusted for accuracy?

green = *S. pulchra,*
brown = *S. lepida*

3 miles

- 682 Acres mapped – two associations noted

- 0.8% of total mapped area

- Much less frequent in the Coastal Zone than in Santa Ana Mtns. Where small (many < MMU) stands do occur

Mapped unit	Accuracy score
Stipa lepida Association	94
Stipa pulchra Association	93

Example of application of site quality: *Leptosyne (Coreopsis) gigantea* Allliance
online MCV http://vegetation.cnps.org/alliance/179

Extensive stand on San Miguel Is.

Summary stats. for detailed mapping projects: acres and size distributions of stands of Giant Coreopsis alliance
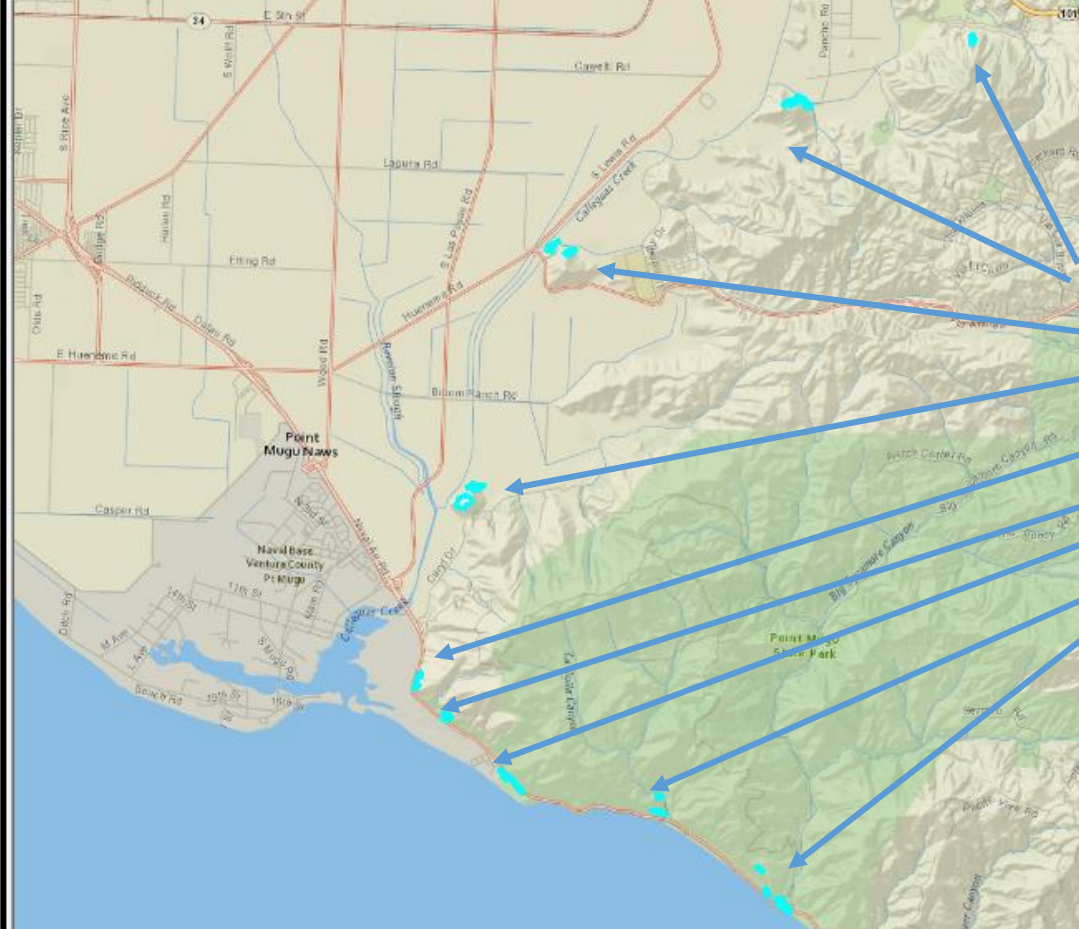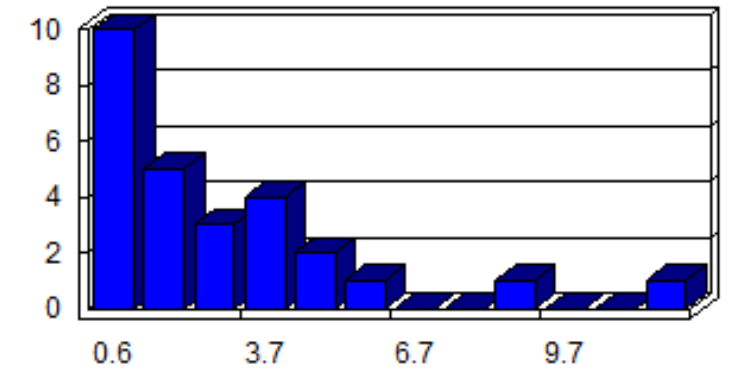
Selection Statistics of Santa_Monica_Mountains_NRA

Field

Acres

Statistics:

Count: 27
Minimum: 0.642031
Maximum: 12.623792
Sum: 85.107631
Mean: 3.152134
Standard Deviation: 2.682061
Nulls: 0

Frequency Distribution

G and S rank for *Coreopsis gigantea* Alliance as of 2010: G3S3?

For *Coreopsis gigantea-Artemisia californica-Eriogonum cinereum*
Association: G1 S 1.2

32

Vegetation occurrences are rated on several components of quality

Larger, but lower quality stand, (based on invasive species and adjacent development and disturbance) Pt. Dume
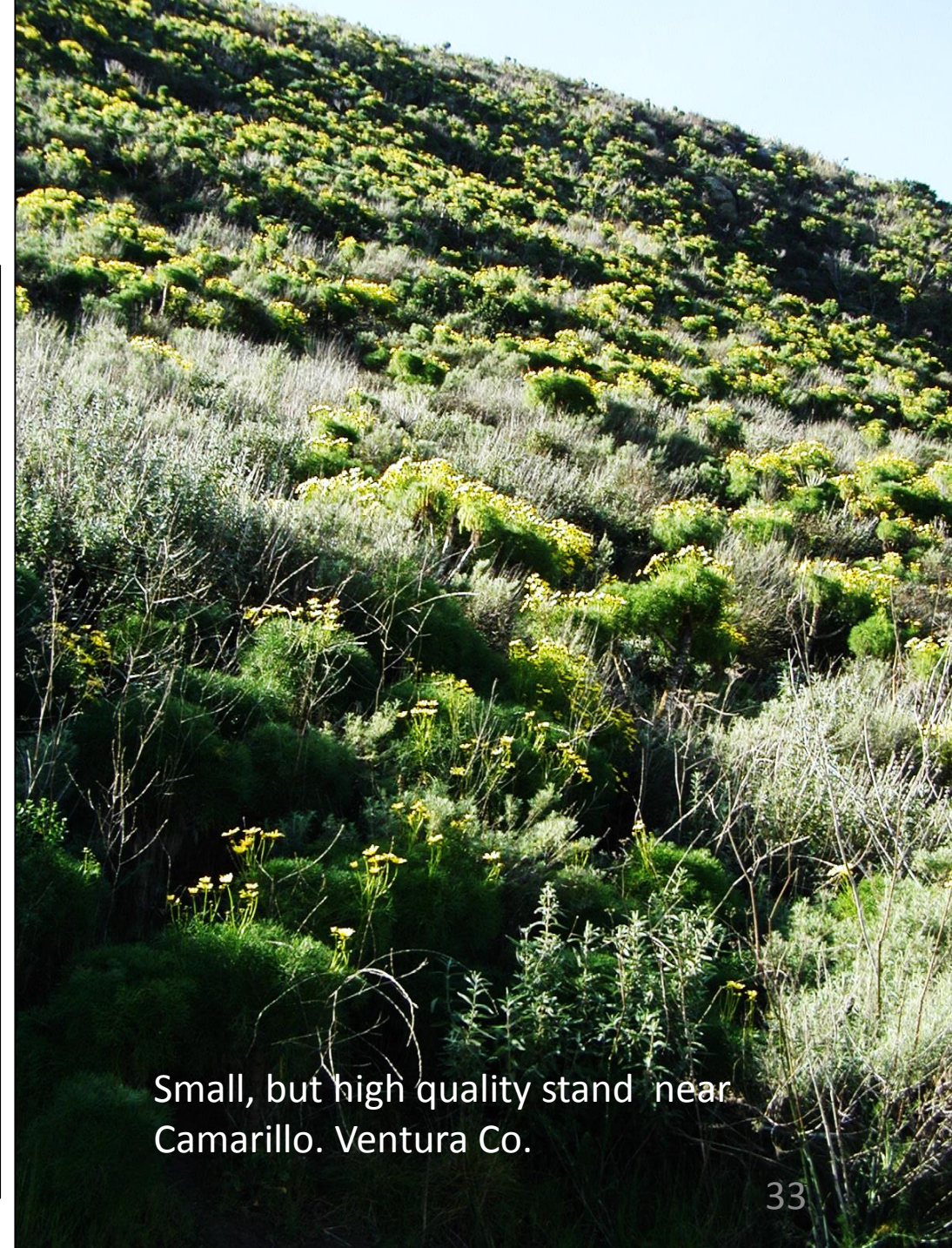
Small, but high quality stand near Camarillo. Ventura Co.

A focused rare natural community project: quantifying and strengthening information on Mendocino Pygmy Forest Ecosystem

Hesperocyparis pigmaea **Woodland Alliance**
Mendocino pygmy cypress woodland

Characteristic Species

Hesperocyparis pigmaea is dominant or co-dominant in the tree canopy with *Pinus contorta* ssp. *bolanderi*, *Pinus muricata* and *Sequoia sempervirens*. Shrubs of heights similar to the cypress may include *Arctostaphylos columbiana*, *Arctostaphylos nummularia*, *Gaultheria shallon*, *Rhododendron columbianum*, *Rhododendron macrophyllum* or *Vaccinium ovatum*.

Vegetation Layers

Trees < 2 m; canopy of trees is open to intermittent. Shrub layer is open to intermittent. Herbaceous layer is sparse. Lichens and mosses occur on the soil surface and on the woody plants as epiphytes.

Membership Rules

- *Callitropsis pigmaea* dominates the tree canopy (Westman 1975).

Habitats

Uplifted marine terraces and associated sandstone. Soils are acidic spodosols of the Blacklock soil series with cemented hardpans that are seasonally flooded.

Other Habitat, Alliance and Community Groupings

MCV (1995):	Pygmy cypress series
NVCS (2009):	Cupressus goveniana shrubland alliance
Calveg:	Pygmy cypress
Holland:	Mendocino pygmy cypress forest
Munz:	Closed-cone pine forest
WHR:	Closed-cone pine-cypress
CDFW CA Code:	81.400.00

National Vegetation Classification Hierarchy

Formation Class:	Mesomorphic Tree Vegetation (Forest and Woodland)
Formation Subclass:	Temperate Forest
Formation:	Warm Temperate Forest

USDA Ecological Section Map

Leaflet | Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Summary Information

- **Primary Life Form:** Tree
- **Elevation:** 25-150 m
- **State Rarity:** S2
- **Global Rarity:** G2
- **Distribution:** USA: CA (NatureServe) (Calflora)
- **Endemic to California:** Yes
- **Endemic to California Floristic Province and Deserts:** Yes
- **Date Added:** 1995/11/01

Coastal Zone Boundary
Oligotrophic vegetation on terraces*
Blacklock/Aborigine-NWI overlap
Blacklock and Aborigine Soil Map Units**
National Wetland Inventory (NWI)

*Mapped from aerial imagery
**Soil Survey Geographic (SSURGO) database for Mendocino Co., Western Part, CA, USDA, NRCS, Jan 12, 2012

CDFW Eureka, CA July 2014

Potential Pygmy Forest Sampling Area

Goal of Project:
Refine understanding of pygmy cypress alliance and associations based on sampling within the full distribution of pygmy ecosystem including:

- Soils mapping

- Geomorphic surface (marine terrace) mapping

- Previous vegetation mapping

- Wetland mapping

- Indicator species' distribution

New understanding of Pygmy Cypress Forest (from 2015-2016 data analysis:

- Composed of 3 associations of *Hesperocyparis pigmaea* alliance (Total acreage is less than 3000) all ranked G2S2.1:

Hesperocyparis pigmaea-Pinus contorta bolanderi/Rhododendron columbianum
Hesperocyparis pigmaea-Pinus contorta ssp. bolanderi-Pinus muricata/Rhododendron macrophyllum
Hesperocyparis pigmaea-Pinus muricata/Arctostaphylos nummularia

- Plus 3 wider ranging associations of different alliances endemic to oligotrophic soils of N. and Central CA Coast:
  - *Arctostaphylos nummularia - (Arctostaphylos glandulosa - Rhododendron macrophyllum* (G2S2.2)
  - *Pinus muricata-Chrysolepis chrysophylla/Arctostaphylos nummularia* (G2 S2.2)
  - *Chrysolepis chrysophylla / Vaccinium ovatum* (G3S3.2)

Summary: Vegetation Rarity Ranking:

- Similar to rare species ranking

- Best done using quantitative definitions and range-wide vegetation mapping

- Rank status updating will be ecoregional (underway in South Coast this spring)

- Online Natural Communities http://www.dfg.ca.gov/biogeodata/vegcamp/natural_communities.asp

- New types are defined by repeated sampling and quantitative definition available at: http://www.dfg.ca.gov/biogeodata/vegcamp/veg_classification_reports_maps.asp

- Descriptions available online for the range of all major alliances (http://vegetation.cnps.org/)

- For background on ranking see: NatureServe Conservation Status Assessments: Factors for Evaluating Species and Ecosystem Risk http://www.natureserve.org/sites/default/files/publications/files/natureserveconservationstatusfactors_apr12.pdf

- For best current California Natural Community ranking information contact VegCAMP program (Todd.Keeler-Wolf@wildlife.ca.gov, Diana.Hickson@wildlife.ca.gov)