Maritime Chaparral

Towards a Standardized Field Identification Procedure

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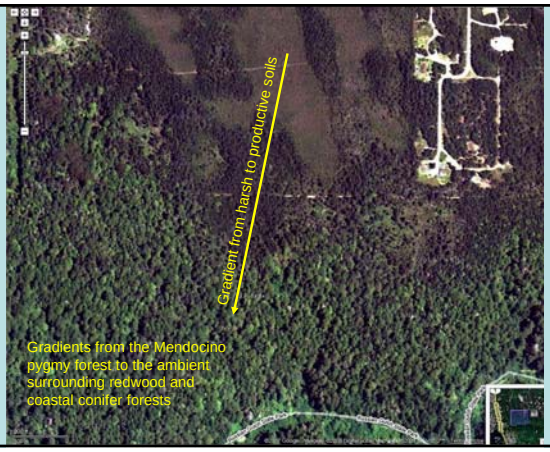
Some Important Points for Starters

- Maritime chaparral is distinct and localized for basic ecological reasons (we are not "making this up")
  - it is distinct from other chaparrals, although clearly related to them
- However, we are currently working with hypotheses underlying its ecological distinctiveness, most not specifically tested for our local situations
- This is not and cannot be a "cookbook" approach because:
  - The species composition shifts from stand to stand (maritime chaparral is a convenient name for many distinctive combinations of species, it is not "one thing")
  - The controls on the boundaries of stands vary based on local site conditions

The key to the presence of chaparral in the maritime zone: Oligotrophic Soils

- The nutrient-poor soils of northern and central coast maritime chaparral harbor distinct communities containing edaphic endemic plants
  - Part of a suite of coastal California oligotrophic communities including Mendocino pygmy forest
  - These produce very different ecological conditions for plants than the ambient regional "norm"
- An ecological gradient exists from the poor soils in the core of these stands to less harsh settings at their edges
  - Vegetation stature, canopy closure, species richness, litter biomass and pH generally increase along the gradient from its core, outward.
  - Soil organic matter and available water capacity tend to be highest at the outer edge



A telescopic view from the center to the edge of a pygmy forest stand

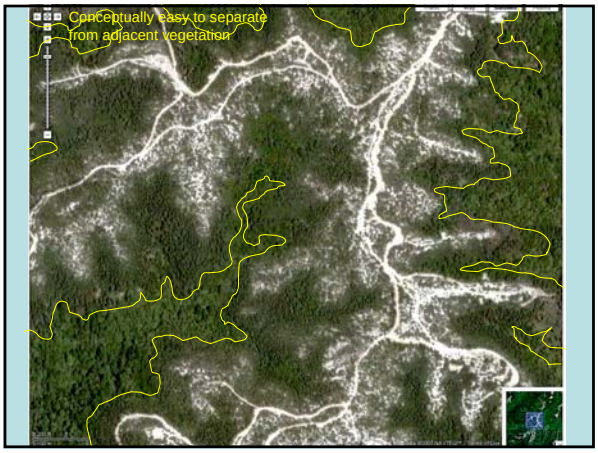
The gradient varies in its sharpness from stand-to-stand

- Perimeter of chaparral expands and contracts over time due to interaction of:
  - Fire frequency and intensity (average fire return interval in recent past varies from 10-100 yrs)
  - Catena of soils (severity of oligotrophic soils and sharpness of gradient away from core zone, equates to resilience of chaparral to succession)
  - Climatic shifts (moist periods more likely to drive rapid tree colonization of periphery)
  - Human-mitigated disturbance (e.g., scraping, clearing)

Coast live oak or other native or non-native trees commonly show recruitment, or resprout and shade-out maritime chaparral stands

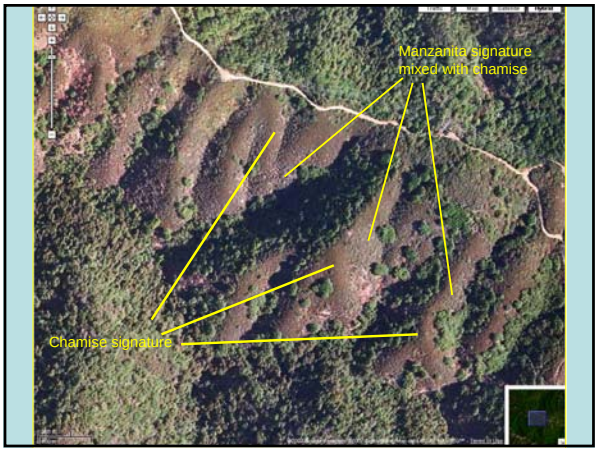
How to think about addressing the variability in the gradient

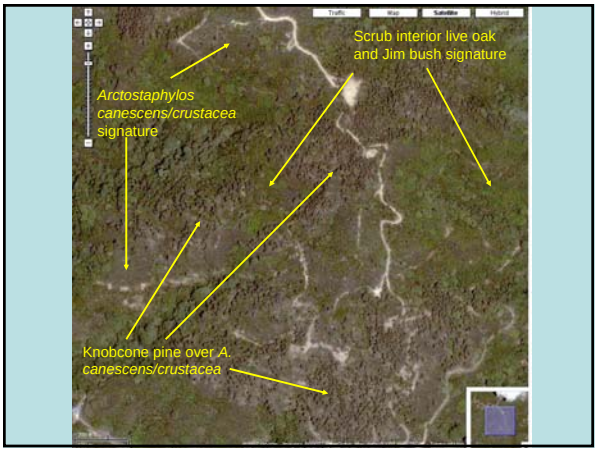
- Understand the local site conditions for your stands
  - What are the local adjacent communities?
  - How do they respond to type, rate, and intensity of natural processes?
  - What are the local key indicator chaparral species?
  - How long has it been since the last significant stand-altering or replacing event?
- Survey in adjacent oak or grassland stands for skeletons and senescent/shaded chaparral
- Look for distinctive habit of any chaparral shrubs (chamise, ceanothus or especially *Arctostaphylos* stems or (longer persisting) evidence of burls of (*A. crustacea, A. tomentosa*, etc.)



Understanding key air-photo signatures

- Chaparral in the maritime zone clearly looks different than surrounding vegetation
  - Stature (shrubs from trees)
  - Texture and hue (coastal scrub from chaparral
- Certain chaparral dominants have visibly distinct photo-signatures
- Although trees are different communities, some tree species are good local indicators (or differentials)





Issues of Resilience: Fire Characteristics of Component Species

- Resprouting species
  - *Arctostaphylos tomentosa, A. crustacea, A. glandulosa* (rarely), *Quercus agrifolia, Chrysolepis chrysophylla* var. *minor, Vaccinium ovatum,* etc.
- Obligate seeding species that require fire for regeneration (maximum life span (100-150 yrs?)
  - *Arctostaphylos hookeri*, *A. pajaroensis*, *A. canescens, Ceanothus papillosus, Cupressus abramsiana, Pinus attenuata.*

Criteria for Judging Perimeter

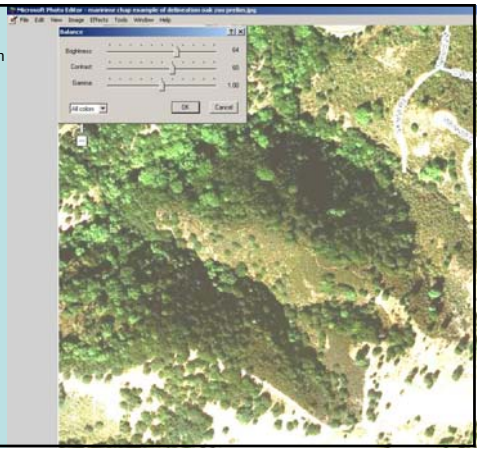
- Notion of community composition
  - Probable (or potential) extent, based on aspect, soils
  - Chaparral species get shaded out under oaks and other woodland canopy
  - Long persisting stands of these trees do not have a true chaparral component (we're talking decades, not centuries)
  - Evidence of dominant life form shift will be clear (age of oaks or other tree species will be young, small size classes, chaparral individuals will all be old and show signs of senescence)
- Surveys should use multiple forays radiating from core stand into adjacent vegetation stands and should be based on reasonable expectation of time/effort information return
  - Understand normal gradients and limitations of chaparral versus forest/woodland
  - Look for abrupt slope differences, soil/substrate differences, vs. gradients of these
- Presence of chaparral indicator species (not just rare species, although they do have greater significance)
- Other associated "non-chaparral" plants such as Knobcone pine, dwarf chinquapin, black huckleberry
- Estimate of density and dispersion of senescent or skeletal chaparral shrubs (visible evidence)

Principal Steps

- Obtain air photos of project area (examples use Google earth/maps)
  - Also valuable to have digital topo lines, good soils maps, etc. if available
- Train on signature of chaparral types in coastal zone (i.d. chaparral vs. coastal scrub signature)
- Preliminary delineation
  - Primary core delineation of chaparral
  - Potential secondary edge in zone of tree increase
- Field check
  - Check preliminary boundary for missed signatures
  - Search for density and dispersion of indicator chaparral species within core and secondary zones
- Collect field data using rapid assessment method following thorough inventory of core chaparral stand and peripheral zone
- Refine primary and secondary delineation if necessary

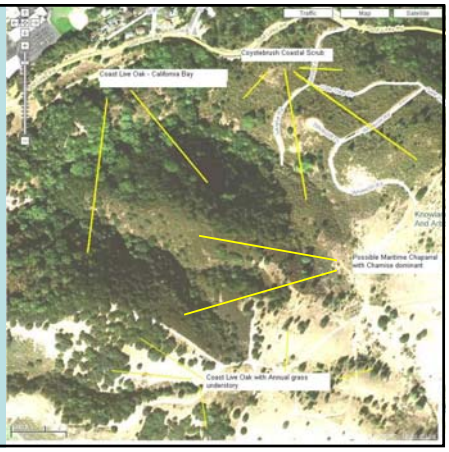
• Experiment with color, hue, texture, as modified by exposure adjustments.

• Emphasize the distinctive signatures of maritime chaparral stands



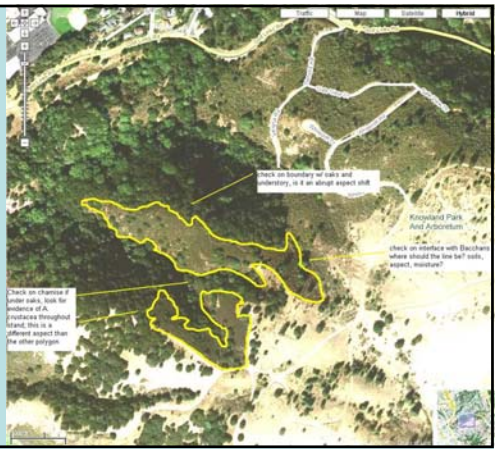
• Understanding the basic vegetation signatures

• It's useful to have an understanding of the local vegetation and how the general types look from the air

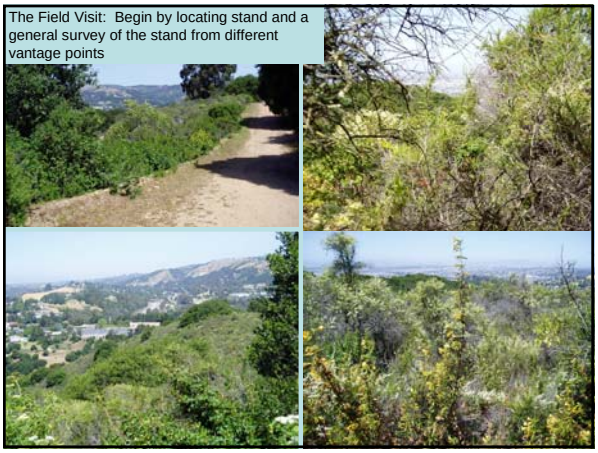


• First-cut delineation and,

• Developing a set of questions before field assessment



The Field Visit: Begin by locating stand and a general survey of the stand from different vantage points



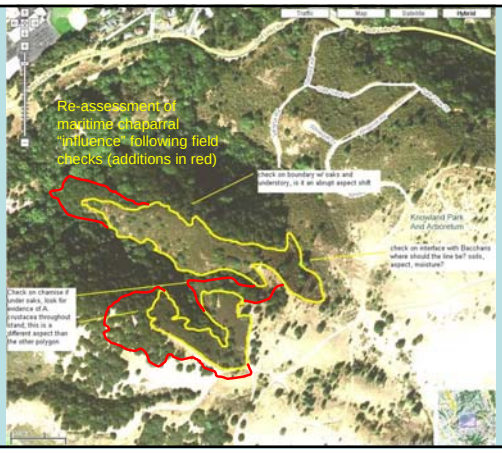
Search for expected indicator species. *Arctostaphylos crustacea* is scattered throughout stand at an estimated 4% cover

Further evidence for chaparral persistence:

Understory scattered, but consistent with chaparral in this area (*Pedicularis densiflora, Agrostis pallens*, etc.), not with early seral coastal scrub, or shady oak woodlands.

Current state of resilience and shifting dominance: Evidence of senescent chaparral under currently expanding Coast live oak woodland at periphery.

Senescent chamise surrounded by annual grassland with native component including *Nassella pulchra* and *Danthonia californica* about 20 m from dense chaparral. Oaks also expanding into grassland.

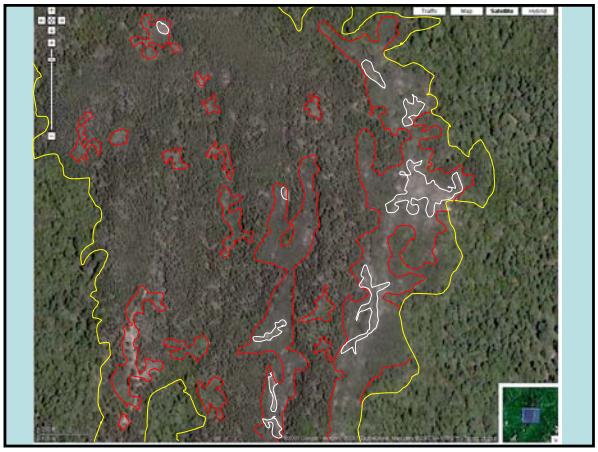


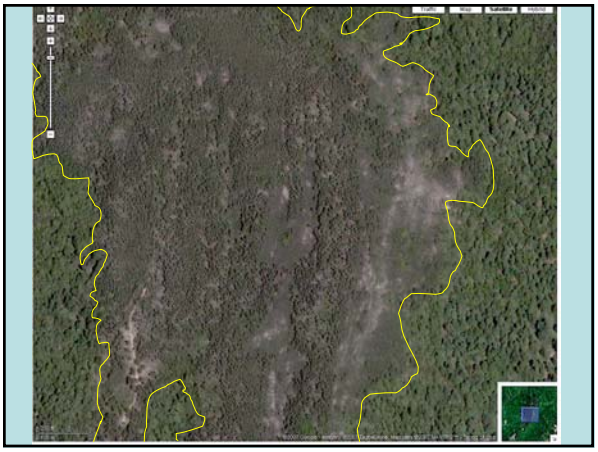
Landscape-related Issues

- Maritime chaparral is patchy and local
- Maritime chaparral composition varies
  - Indicator species vary from region to region
  - Depending on size and history of stand all indicator species may not be present in a given stand
- Basic conservation criteria should be considered
  - Multiple contiguous or proximate stands have greater value than local, fragmented and/or isolated stands (unless those are the only known locations or best locations for certain types or certain species)

The core maritime chaparral vs. the "Habitat" definition

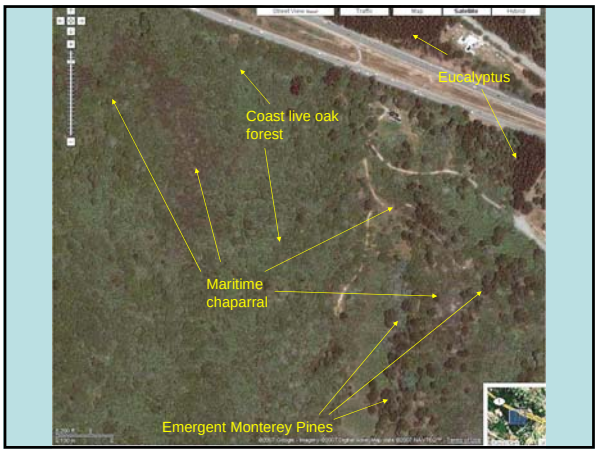
- Do not get initially "hung-up" on the "perfect" definition, or delineation, because it currently does not exist!
- Because the endemic species drive the classification it is important to:
  - Include other related vegetation in the delineation (e.g., knobcone pine with maritime species beneath it)
  - Think broadly about the temporal variation and connectivity issues at a landscape scale, not just a "patch" scale

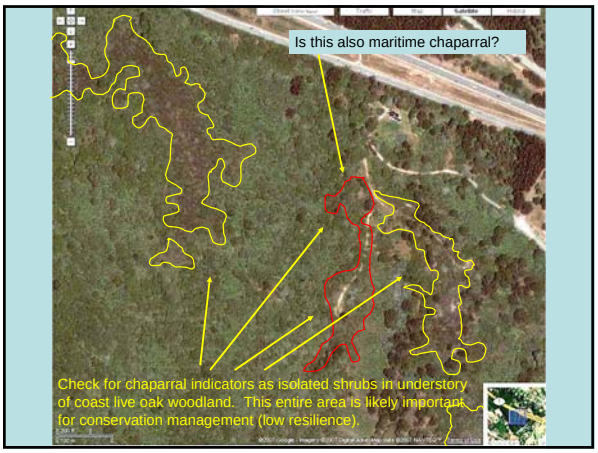




Metrics for Field Assessment of Gradational Boundary

- Estimate cover of living stems of chaparral understory species (by species)
- Estimate density of dead chaparral shrubs within stand of trees
- Note density of senescent or skeleton chaparral shrubs in at least one transect (approximately x m long?) in each bordering stand of different vegetation





Operational Delineation Questions

- Can there be a general agreement on methodology for assessing core and perimeter?
  - Should involve mapping, field data collection and analysis
  - Can't really do it before the data is in
- Is there a rule-based approach for ecologically defining perimeters in all cases?
  - Should involve a good understanding of variability
  - Should be flexible enough to accommodate a range of conditions, both ecological and political
  - Can't really do this before we know the universe of conditions

Conservation Questions

- Are there different levels of rarity of maritime chaparral?
- If so, how do we prioritize conservation actions?
- Can't really understand this until we have the range of possibilities
- (But, the good thing is it doesn't have to take that long)

Preferred Approach

- Should think of this process as a whole, not as small independent assessments
- Start with delineation from aerial photographs based on zone or county-wide assessment (should be done by one entity with good qualifications)
- Visit and sample using standardized vegetation assessments as many delineated stands as possible
- Do quantitative analysis to develop parameters for definitions (for field and mapping)
- Amass site history and site descriptions for as many of the stands as possible (for resilience and site quality information), search for indicators
- Develop regional plan for addressing conservation of all types of "maritime chaparral" in the context of its natural range of variability
  - This means adjacent natural vegetation should be considered as part of the picture, not just the chaparral