

Reading the Landscape of California's Central Coast: Fire Ecology and Vegetation Dynamics

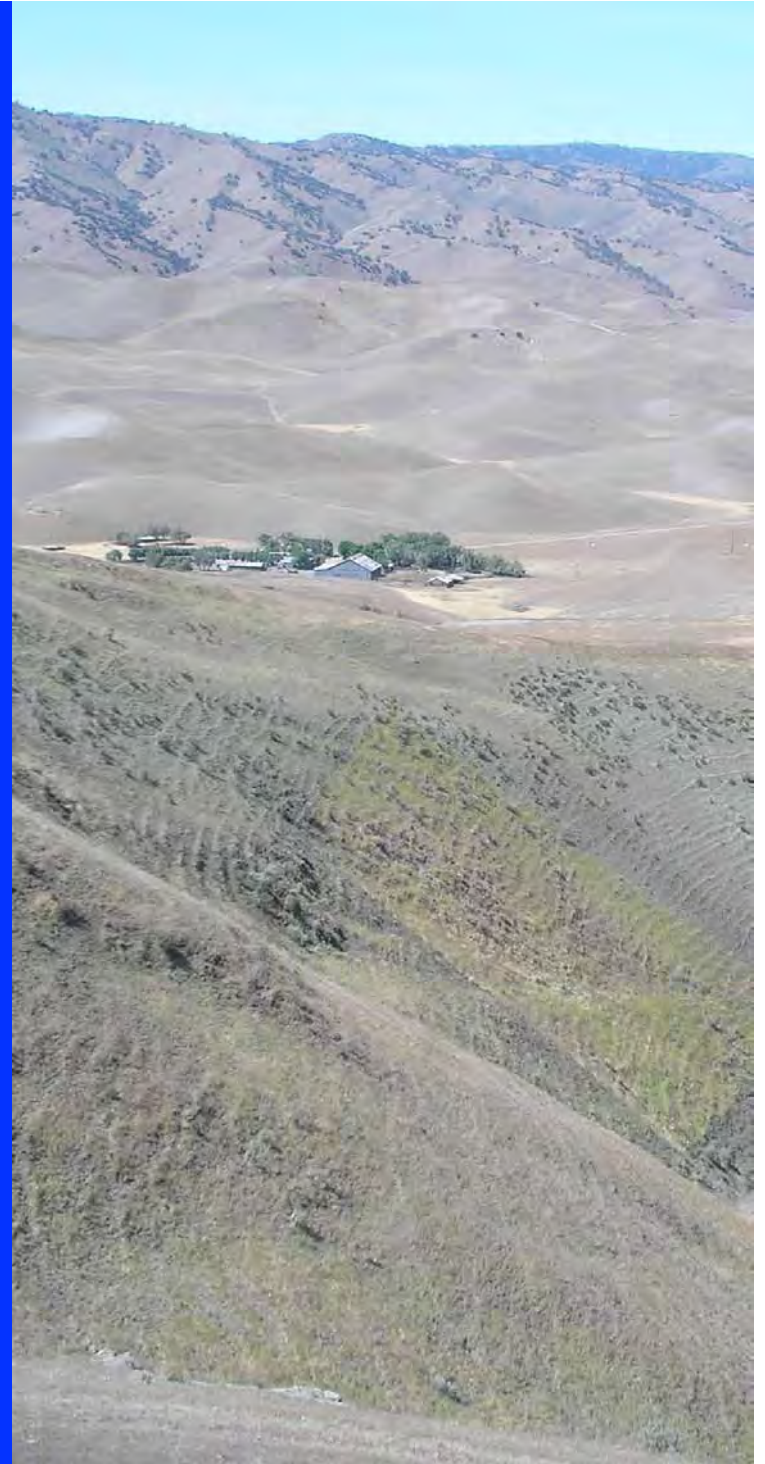


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Outline:

1. Introduction
2. CA Central Coast
Vegetation Patterns
3. Human Habitation Choices
Related to Risk and
Management of Wildfire
4. Questions





by Lech Naumovich 2014, San Bruno Mountain, San Mateo Co., CA



Koopmann Ranch, Alameda Co., CA

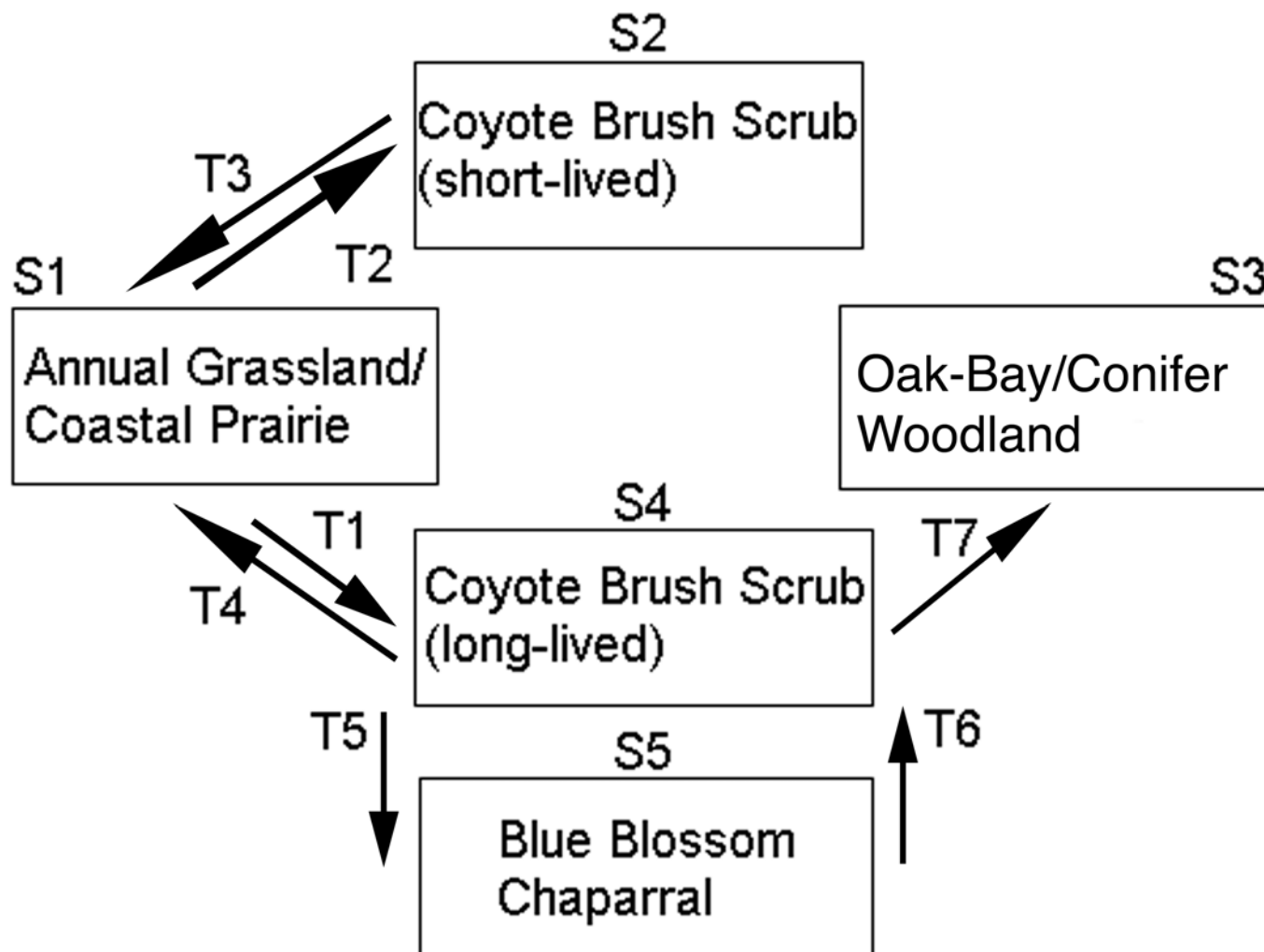


UC Blue Oak Ranch Reserve, San Jose, CA

Big Creek Reserve Post-Fire 2008



State-Transition Model of Coyote Brush Scrub in California



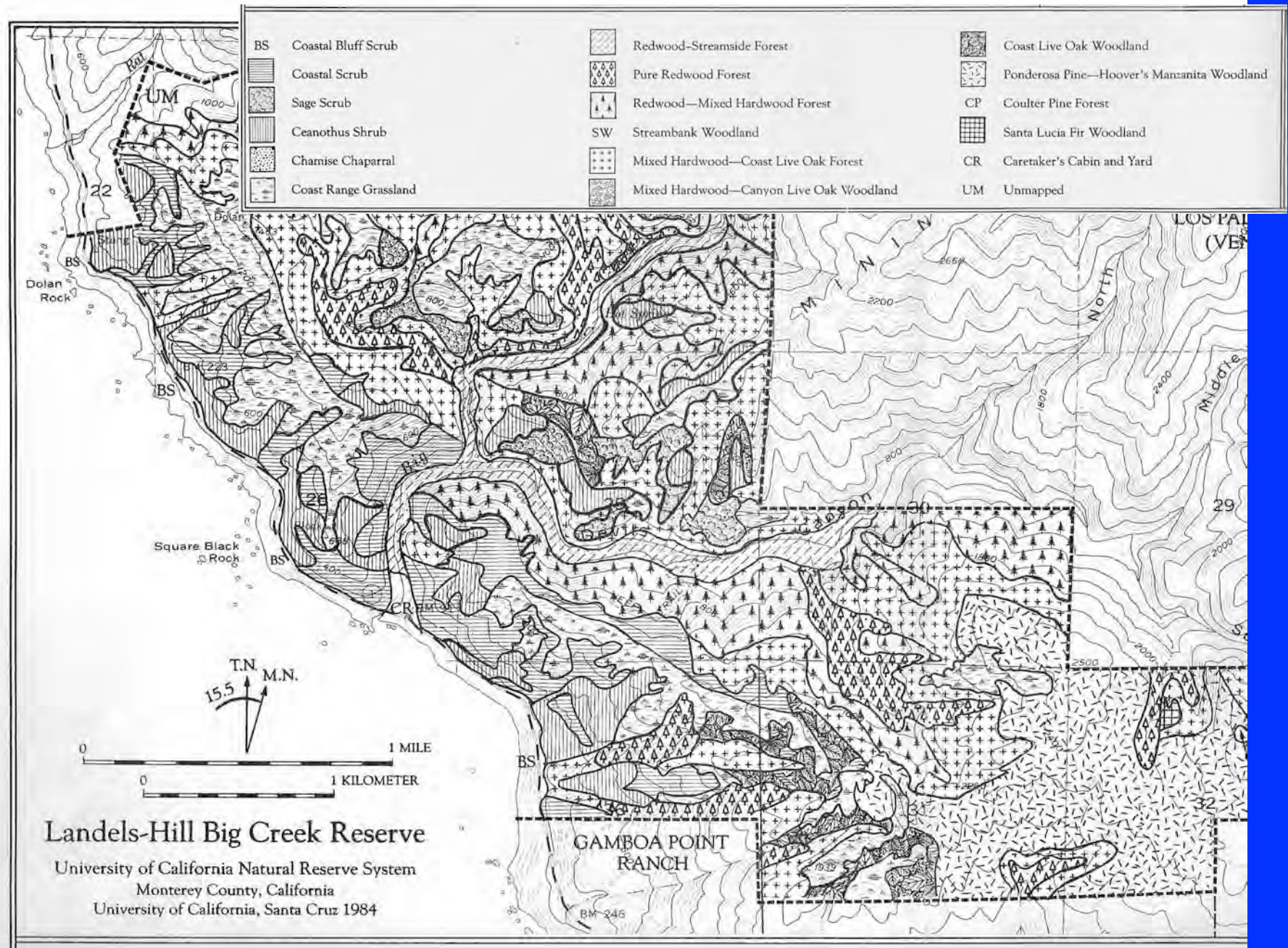
Google Earth Image of Big Creek Reserve 2016



CA Coastal Records Project Image of Big Creek Reserve 2010



Vegetation at Big Creek Reserve, Big Sur, CA



SAN FRANCISCO BAY AREA UPLAND HABITAT GOALS PROJECT

Coarse Filter Vegetation

Vegetation Type Legend:

- Bare Soil / Rock
- Black Pine Forest
- Black Oak Forest / Woodland
- Blue Oak Forest / Woodland
- Blue Oak / Foothill Pine Woodland
- California Bay Forest
- Canyon Live Oak Forest
- Central Coast Riparian Forest
- Chamise Chaparral
- Coast Live Oak Forest / Woodland
- Coastal Salt Marsh / Coastal Brackish Marsh
- Coastal Scrub
- Coastal Terrace Prairie
- Cool Grasslands
- Coulter Pine Forest
- Cultivated Agriculture
- Douglas-Fir Forest
- Dune
- Eucalyptus
- Grand Fir Forest
- Hill Grasslands
- Interior Live Oak Forest / Woodland
- Juniper Woodland and Scrub / Creosote Juniper Woodland
- Knapweed Pine Forest
- Pitch Pine Cypress
- Pine Chaparral
- Pine Coulter / Pine Forest
- Pine Nutgrass Chaparral
- Moderate Grasslands
- Montane Hardwoods
- Monterey Cypress Forest
- Montane Pine Forest
- Native Grassland
- Non-Native Ornamental Conifer / Hardwood Pasture
- Non-Native / Ornamental Conifer
- Non-Native / Ornamental Grass
- Non-Native / Ornamental Hardwood
- Non-Native / Ornamental Shrub
- Oregon Oak Woodland
- Pennine Freshwater Marsh
- Ponderosa Pine Forest (Non-Maritime)
- Pinyon-Cypress Forest
- Railroad Forest
- Rural Residential
- Sagebrush Cypress Forest / Woodland
- Semi-Desert Scrub / Desert Scrub
- Serpentine Barren
- Serpentine Conifer
- Serpentine Grassland
- Serpentine Hardwoods
- Serpentine Knapweed Pine
- Serpentine Leather Oak Chaparral
- Serpentine Rangeland
- Serpentine Scrub
- Tyburn's Alluvial Woodland
- Tanaka Forest
- Urban
- Valley Oak Forest / Woodland
- Warm Grasslands
- Water
- Wet Meadows

Map Labels: SONOMA, MARIN, SAN FRANCISCO, OAKLAND, BERKELEY, CONTRA COSTA, ALAMEDA, SAN JOSE, SANTA CLARA, SAN MATEO.

Scale: 0 to 10 miles.

Data Source: LWL, HRPD, USGS, NCEI, CNR
File Prepared by: Greenleaf Networks, March 2011

Historical Loss of California Grassland:

1. Conversion to crop agriculture and urban development
2. Natural succession to woody vegetation
3. Cultural and economic shifts
4. “Conservation” (reduced grazing and burning)



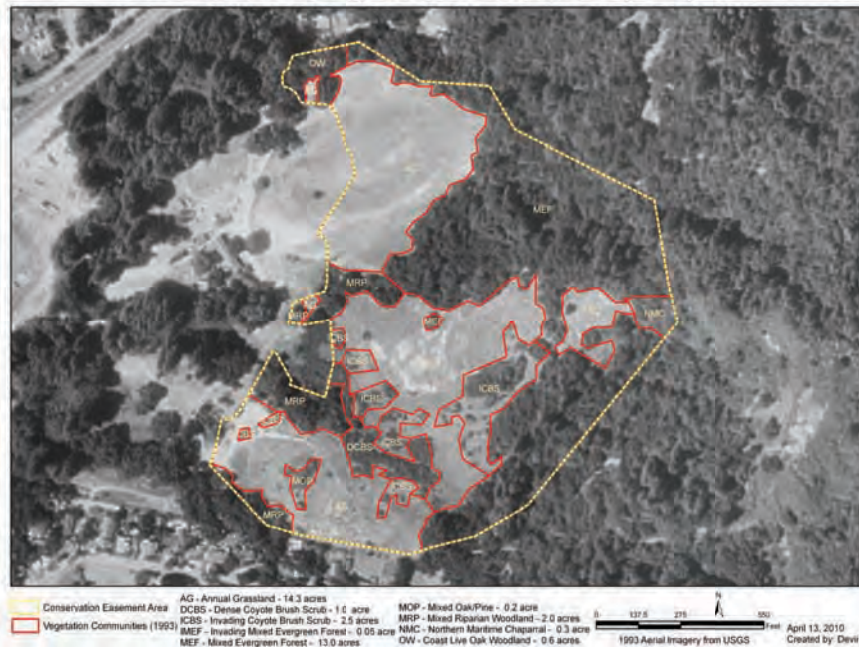
Cloverdale Ranch, Pescadero, CA

Grassland Contraction and Scrub Encroachment Due to Grazing Exclusion—Scotts Valley, CA

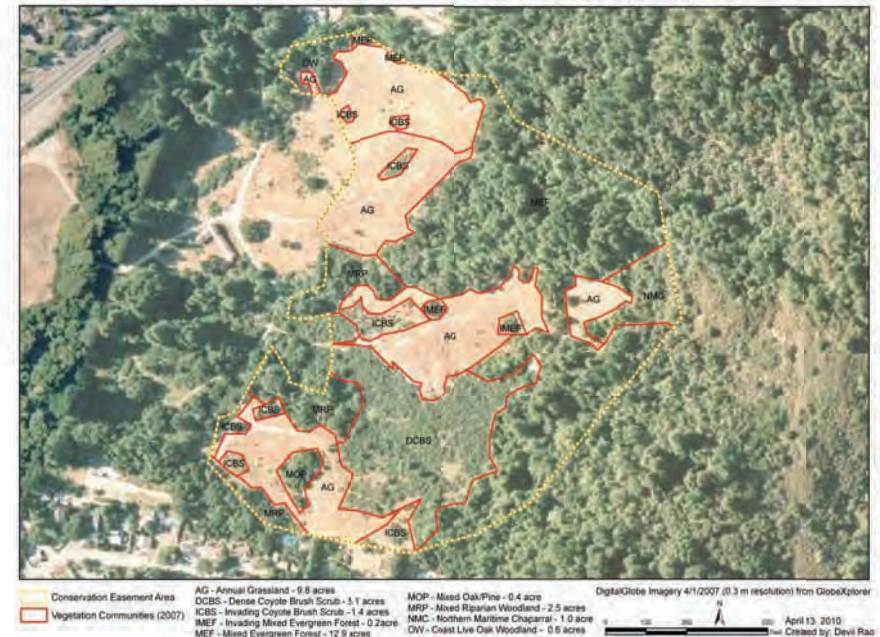
Table 2. Vegetation Community Changes Between 1993 and 2007.

Vegetation Community	1993 acres	2007 acres
Annual Grassland	14.3	9.8
Dense Coyote Brush Scrub	1.0	5.1
Invading Coyote Brush Scrub	2.5	1.4
Invading Mixed Evergreen Forest	0.05	0.2
Mixed Evergreen Forest	13.0	12.9
Mixed Oak/Pine	0.2	0.4
Mixed Riparian Woodland	2.0	2.5
Northern Maritime Chaparral	0.3	1.0
Coast Live Oak Woodland	0.6	0.6
Total	33.9	33.9

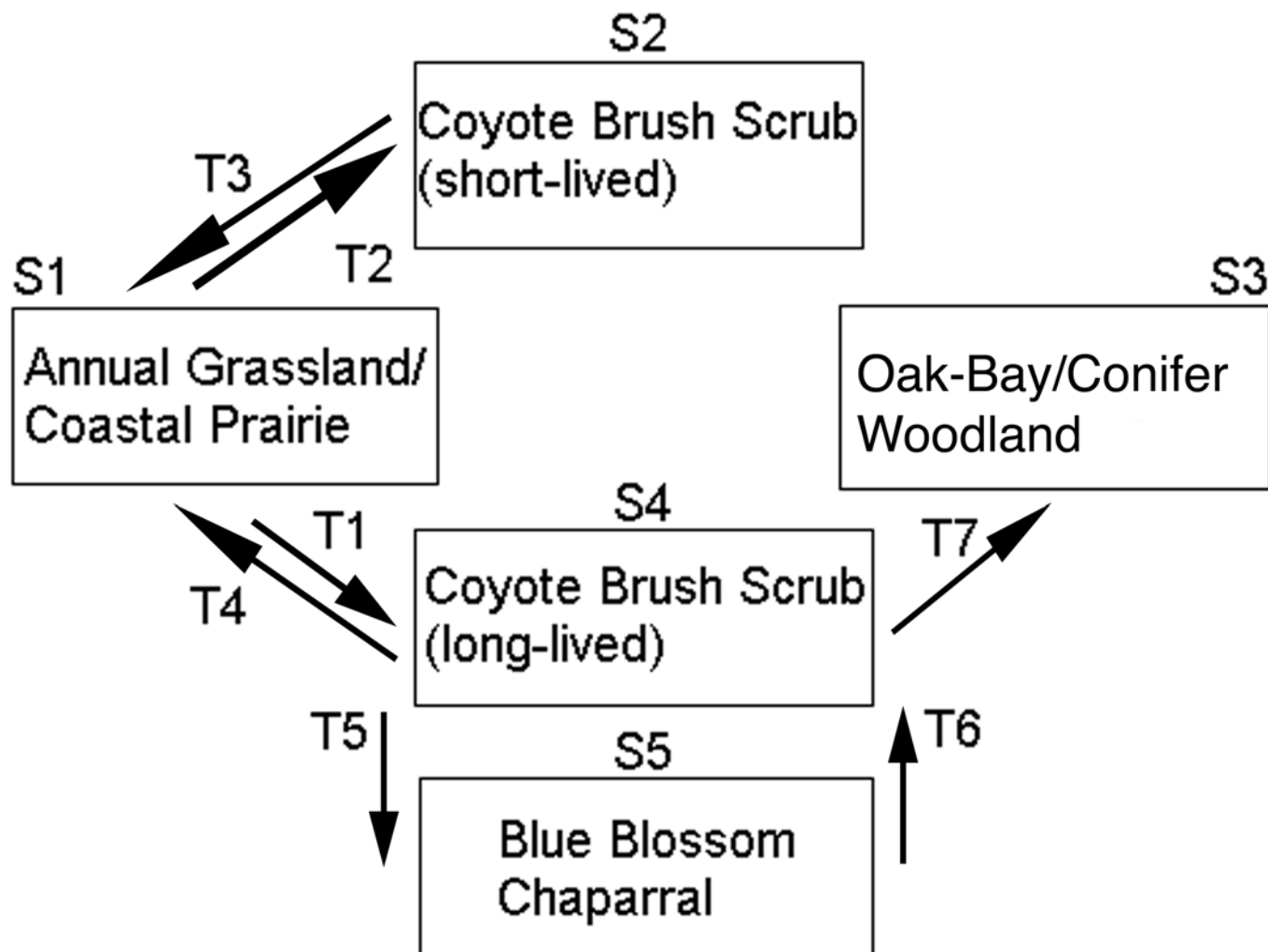
Polo Ranch Vegetation Communities (1993)



Polo Ranch Vegetation Communities (2007)



State-Transition Model of Coyote Brush Scrub in California

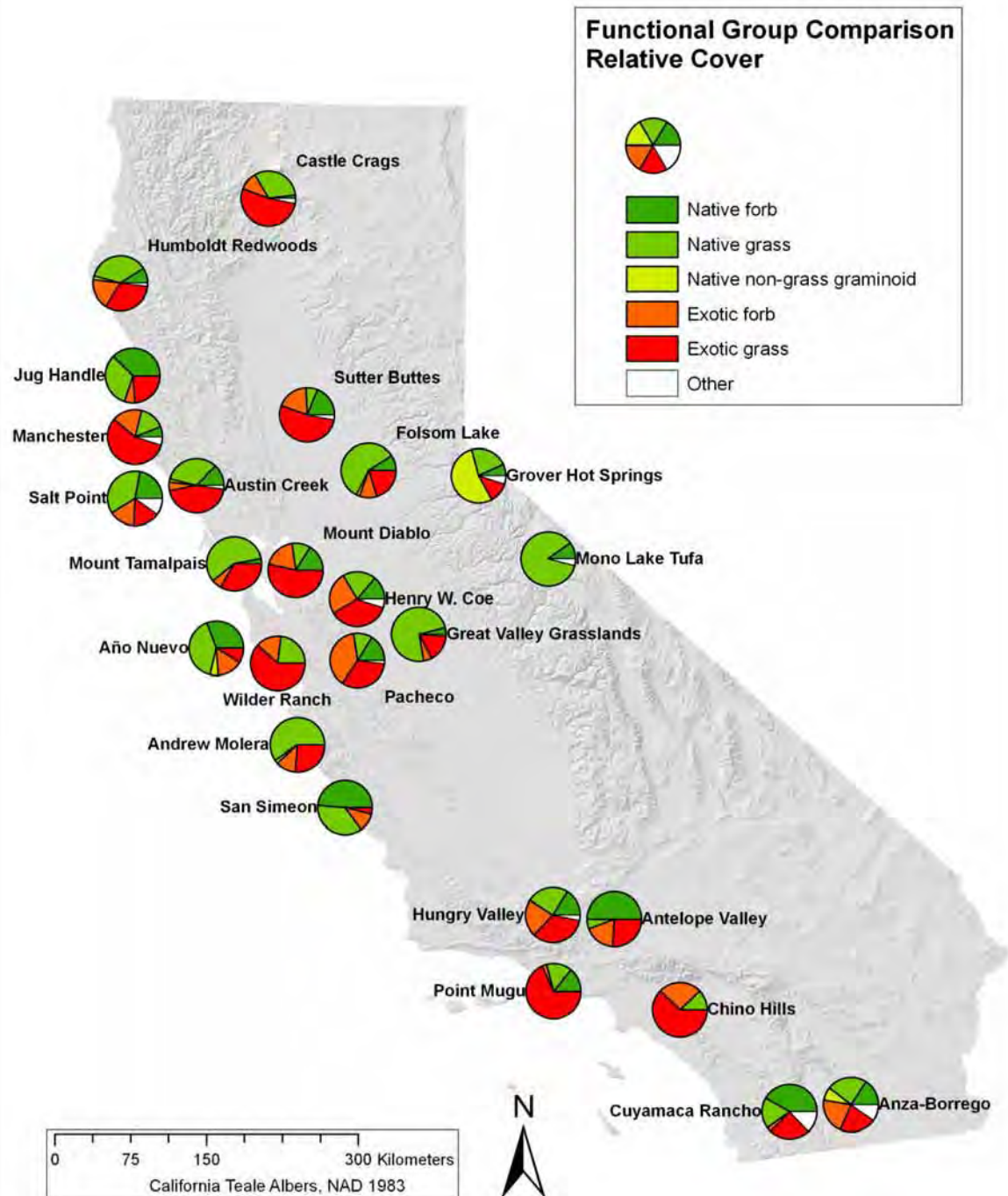


Theories of Calif. Grassland Conversion from Native to Non-Native Plants:

1. Transport by explorers and/or settlers
2. Ecological pre-adaptation
3. Vulnerability to heavy grazing
4. Grasshoppers
5. Agricultural conversion of sites and disturbance of soils
6. Soil erosion
7. Reduced frequency and intensity of fire
8. Combination (!)

Native Vs. Non-Native Composition of Grasslands in California State Parks

From: Hopkinson, Hammond, Spiegel, and Bartolome (U.C. Berkeley). 2009. "Quantitative Assessment and Characterization of Selected State Park Grasslands." California Dept. of Parks and Recreation, Grassland Assessment and Prioritization Project.



Historical Impacts of Inappropriate Farming on Coastal Grasslands (near Pescadero)

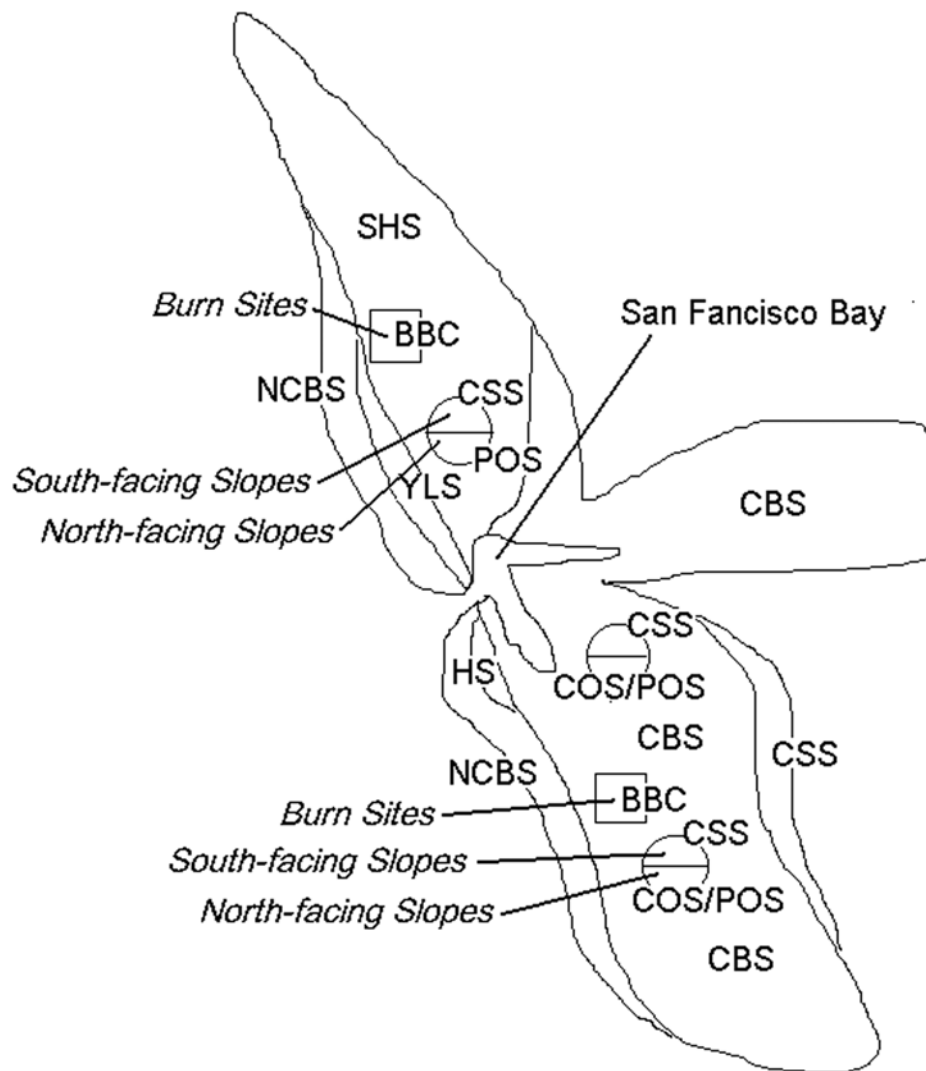


Northern Coastal Scrub in California



Ford and
Hayes 2007

Conceptual Landscape Positions of Northern Coastal Scrub Series in Northern and Central California



SHS=salal black
huckleberry scrub

BBC=blue blossom
chaparral

NCBS=northern coastal
bluff scrub

CSS=CA sagebrush scrub

POS=poison oak scrub

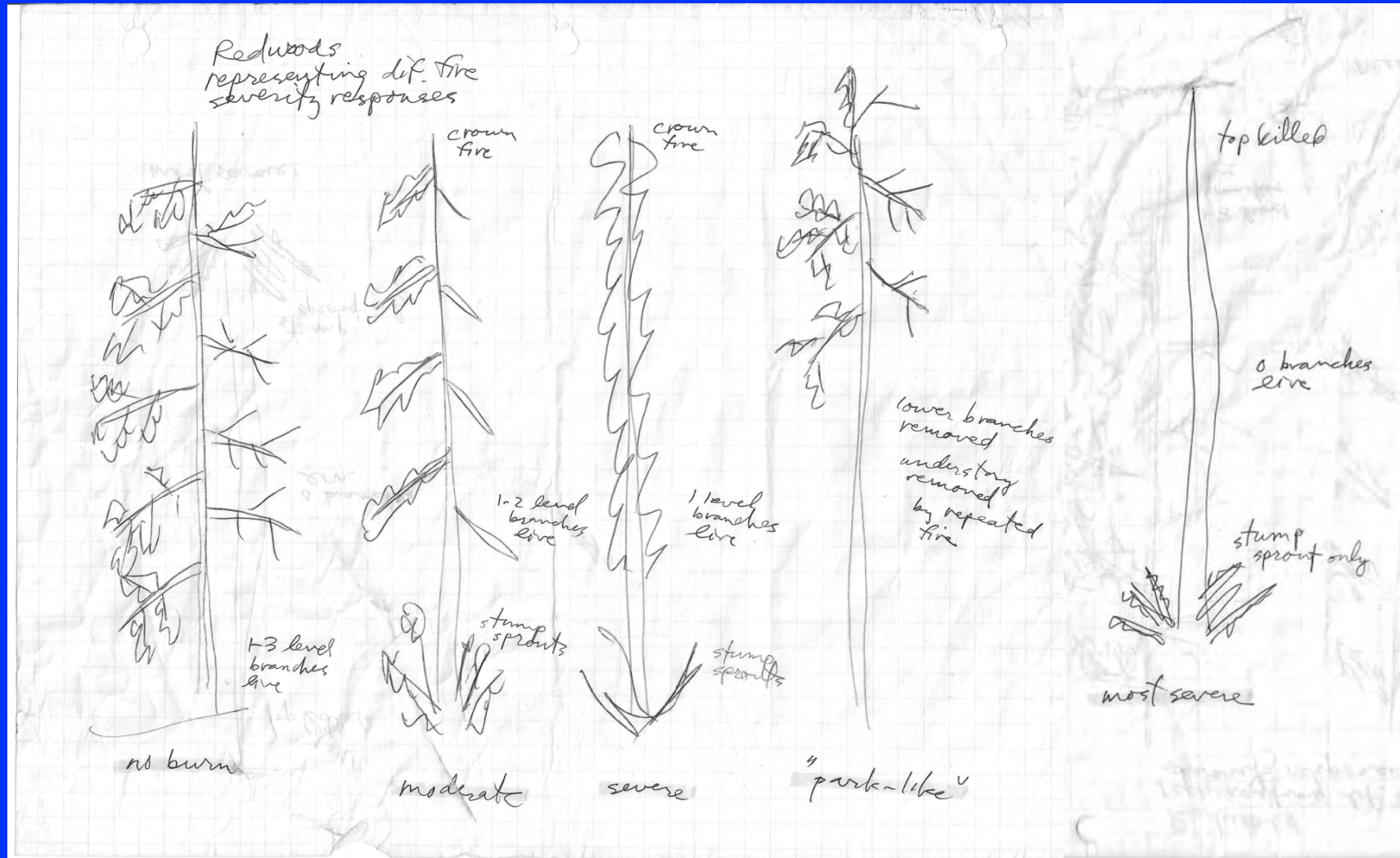
YLS=yellow bush lupine
scrub

CBS=coyote brush scrub

HS=hazel scrub

COS=coffeeberry scrub

Individual Plant Resistance and Resilience to Disturbance (Fire)



Individual Plant Resistance and Resilience to Disturbance (Fire)

- shrubs - Effects of Varied Fire Severity
- Resistance
 - Resilience dependent on mechanism (resprout or seed)



No ash
All foliage

Unburned



Black ash
Little foliage

Light



Grey ash
Only main stems

Moderate

Fire Severity



White ash
Main stems burned off

Extreme

How Severe Was the 2016 Soberanes Fire Here? Will these Chaparral Sites Recover?



(David Royal –
Monterey Herald,
10/1/2016)

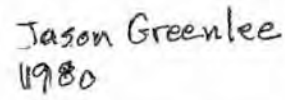
(Gabrielle Lurie,
The Chronicle
10/13/2016)



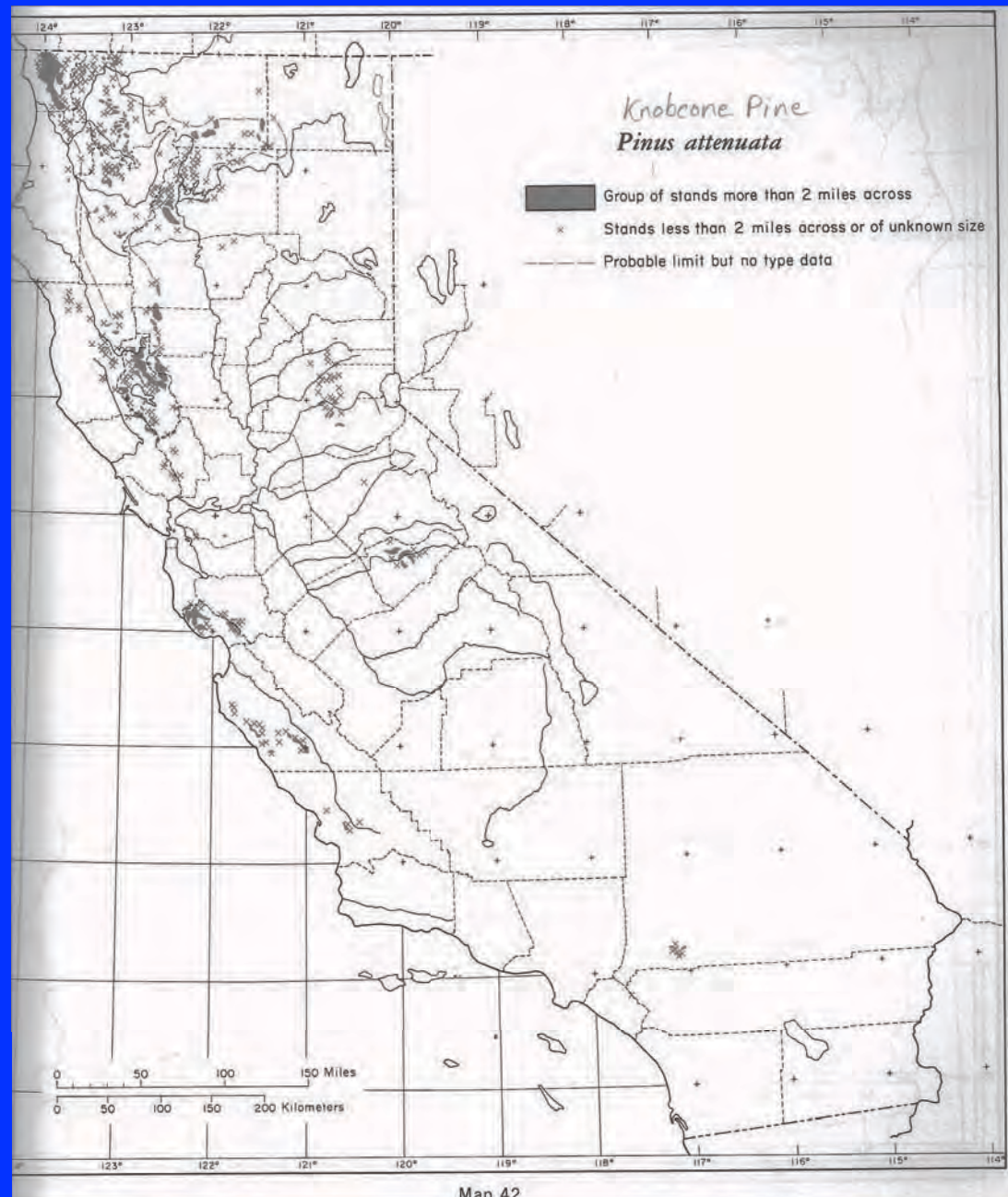


Vasco Caves Regional Preserve, East Bay Regional Park District, CA

Fire-scars on Trees



CA Range of Knobcone Pine (*Pinus attenuata*)



Griffin and
Critchfield
1972

CA Range of Chaparral



Kelley and
Davis 2007

Projection of Prehistoric and Historic Grasslands at Big Creek Reserve



Earth-Sheltered Homes

