

# TEK in the United States

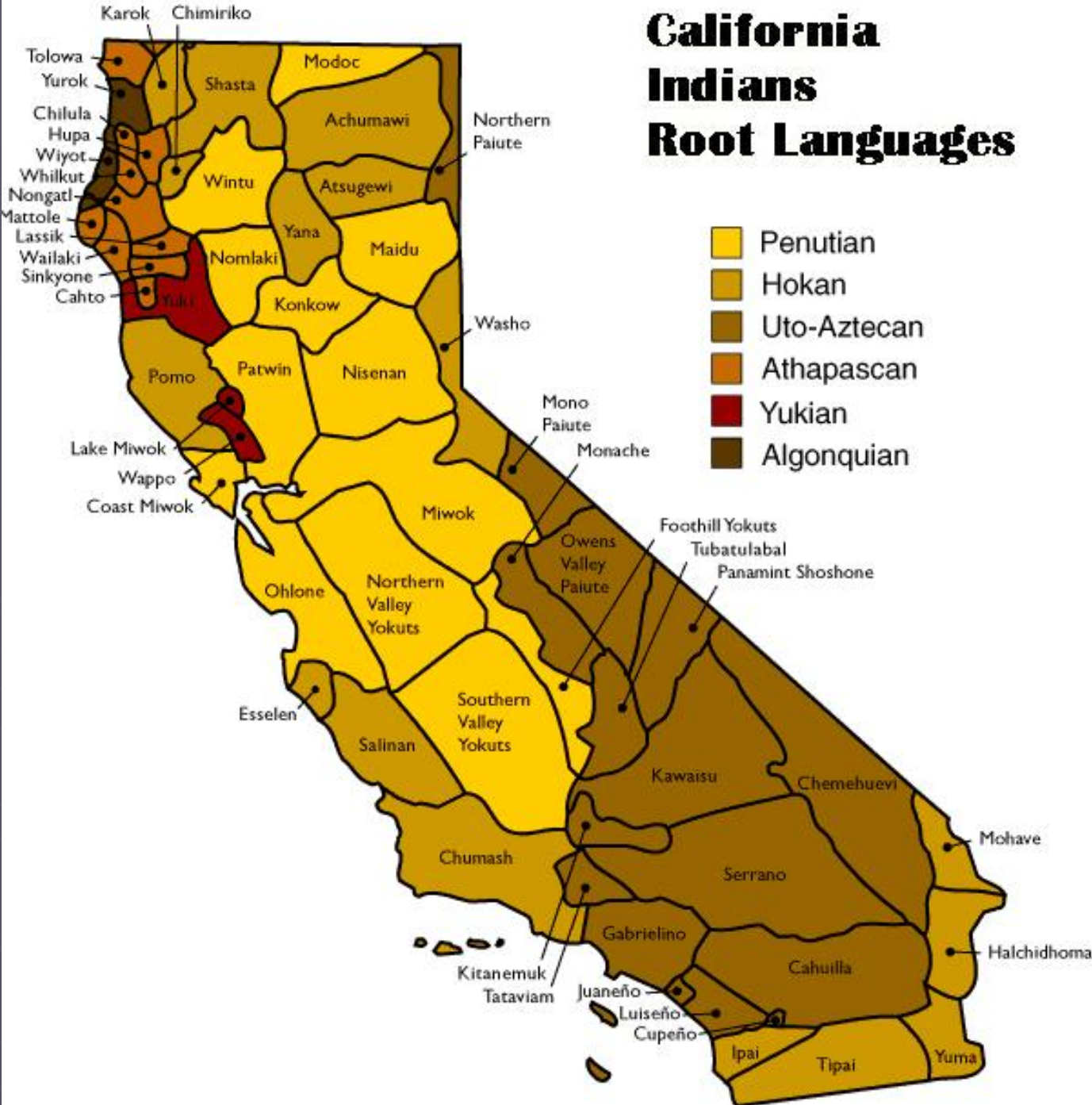
## A Perspective from California



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San Francisco Estuary  
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Center

Resilient Landscapes Program

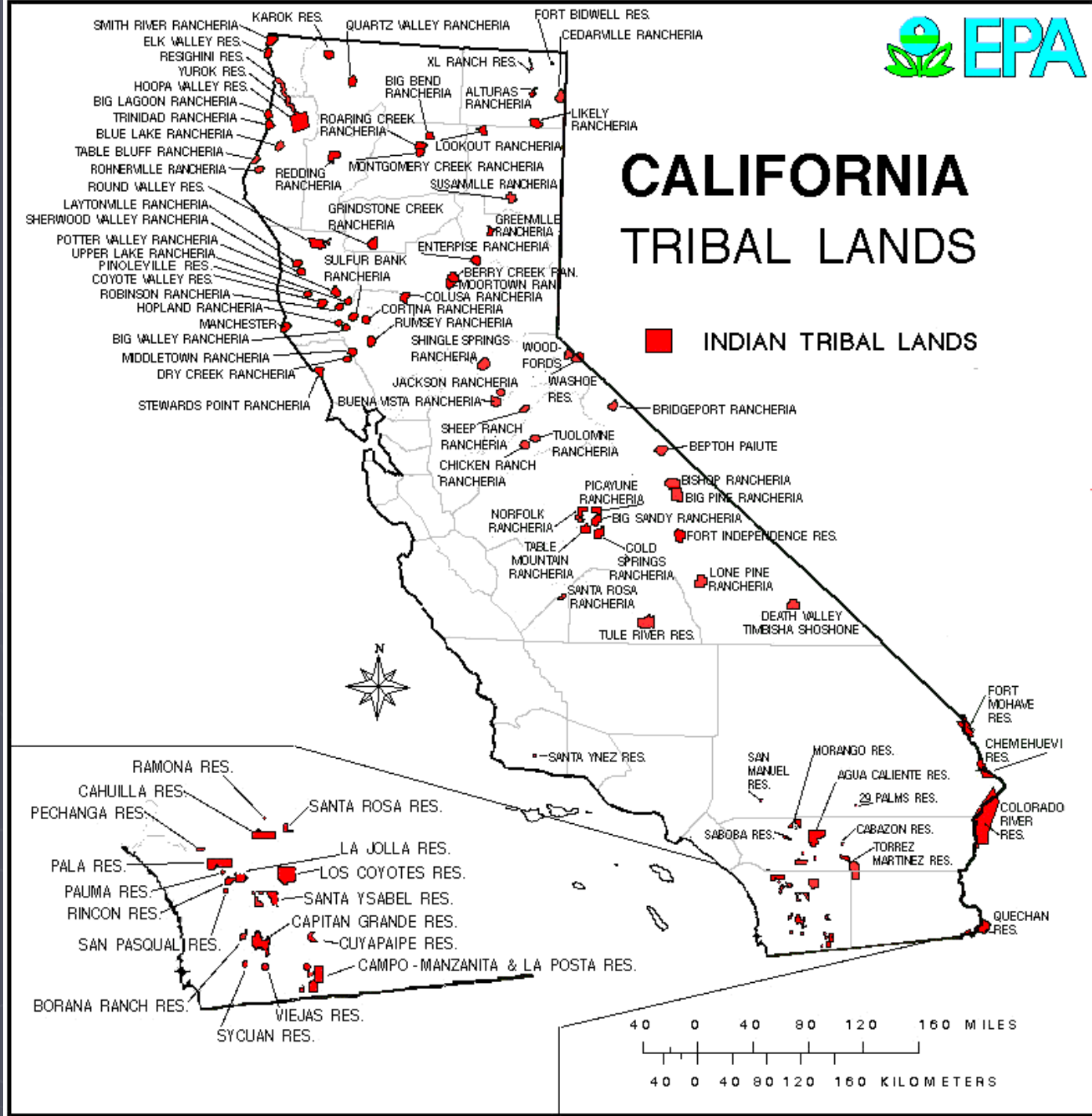
# California Indians Root Languages





# CALIFORNIA TRIBAL LANDS

INDIAN TRIBAL LANDS



1.7% of California's population

Own less than 2% of CA's landbase

352,427 self-identify as Native.

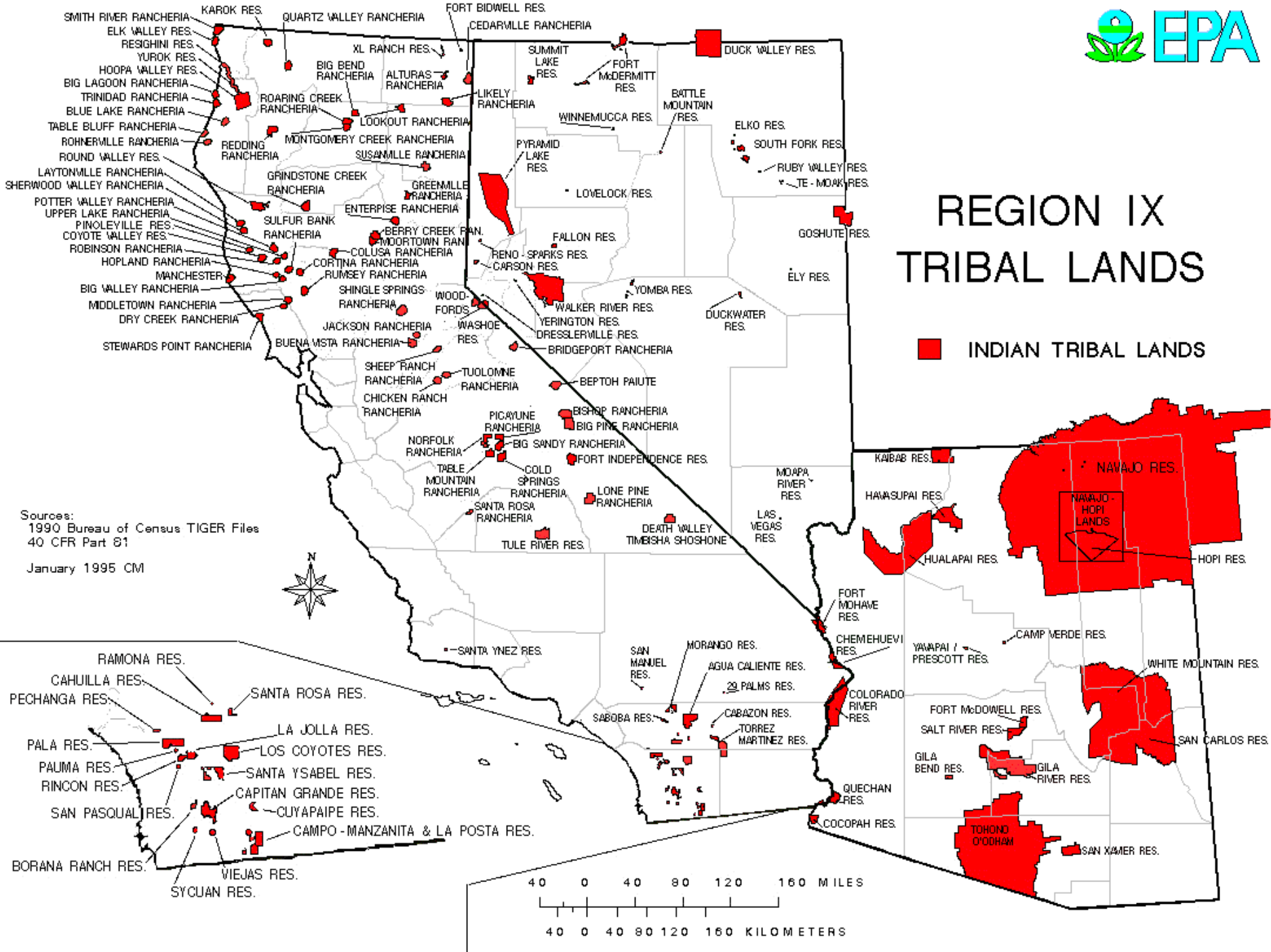
Less than 15% are from CA tribes

No treaties

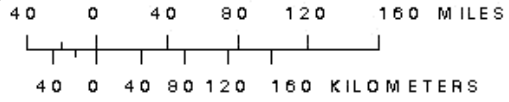


# REGION IX TRIBAL LANDS

■ INDIAN TRIBAL LANDS



Sources:  
1990 Bureau of Census TIGER Files  
40 CFR Part 81  
January 1995 CM



**Tribes have few opportunities to meaningfully contribute to environmental planning and management *outside of reservation boundaries*. This results in:**

- **a lack of tribal engagement in management decisions**
- **impairment of tribally important resources**
- **11<sup>th</sup> hour, inadequate remedies to acute or chronic environmental challenges**
- **Tribes lack adjudicated water rights**
- **vast geographies are home to unresourced, extant, but legally “extinct” tribes.**
- **contentious atmosphere between agencies and tribes**

**State and local regulatory agencies and utilities are under new imperatives to cope with a wide range of environmental challenges caused by climate change, and a legacy of shortsighted resource management regimes in CA. Among these imperatives is a renewed effort to work more closely with California's Tribal governments to resolve these challenges. This requires:**

- **greater tribal engagement in management decisions**
- **greater acknowledgement, study, and protection of tribally important resources**
- **greater State investment in intergovernmental relationships designed to build trust, transparency, and collaboration with tribes**
- **more inclusive scientific and analytical frameworks**

## Science in Indian Country



**“The combination of TEK with mainstream scientific research will enable a comprehensive response to environmental impacts on traditional life-ways.”**

**National EPA – Tribal Science Council. *Integration of Traditional Ecological Knowledge (TEK) in Environmental Science, Policy and Decision-Making.* Tribal Science Priority - June 2011**

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**The tribes have technical-cultural frameworks and methods for natural resource management that developed over many thousands of years [Traditional Ecological Knowledge (TEK)]. Tribes managed ecological processes at the landscape scale, and these practices and principles have application beyond existing tribal lands.**

**This knowledge has become largely decoupled from much more recent municipal, regional, state, and federal land use and land management concepts and doctrines.**

# Expanding the Cultural Context of Historical Ecology



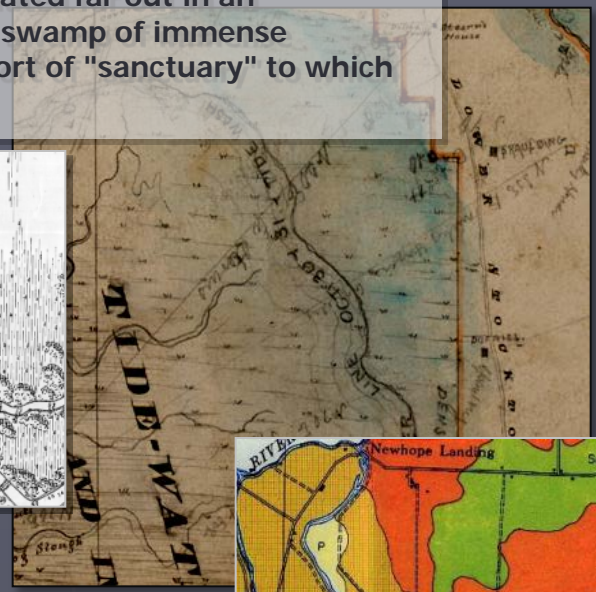
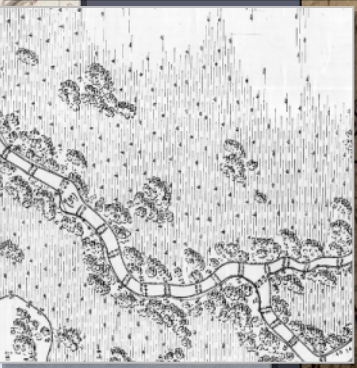
1800

"The lake was situated far out in an impenetrable tule swamp of immense extent...it was a sort of "sanctuary" to which birds came..."

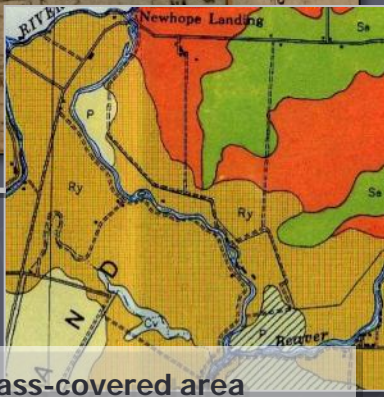
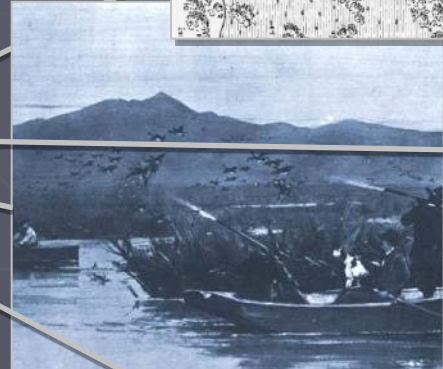
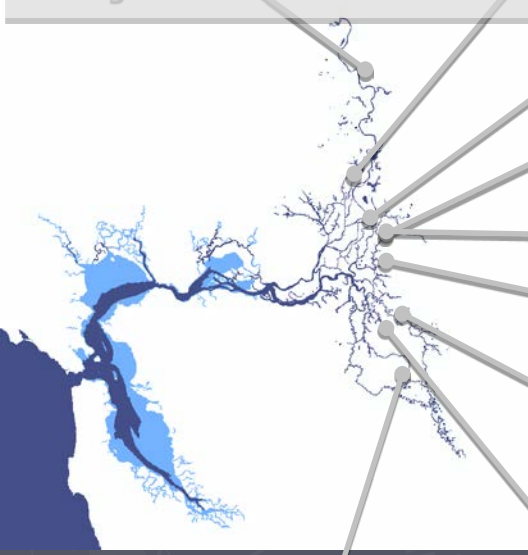


1850

"lagoons...whose waters flowed back swiftly into the Sacramento with the ebbing tides"



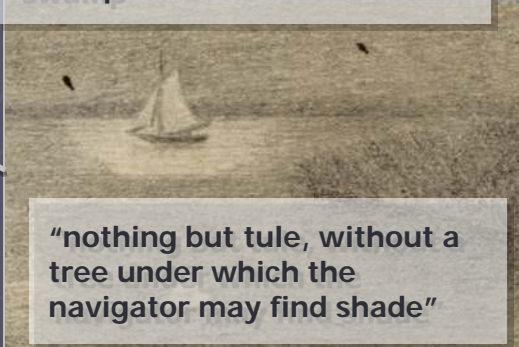
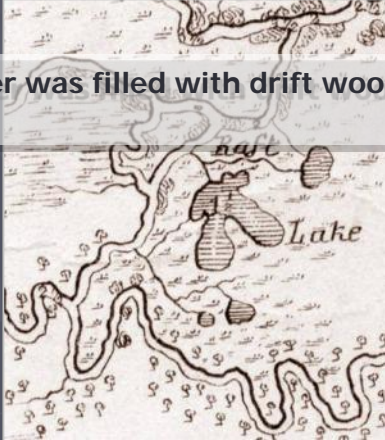
1900



"In a grass-covered area between the forest and swamp"

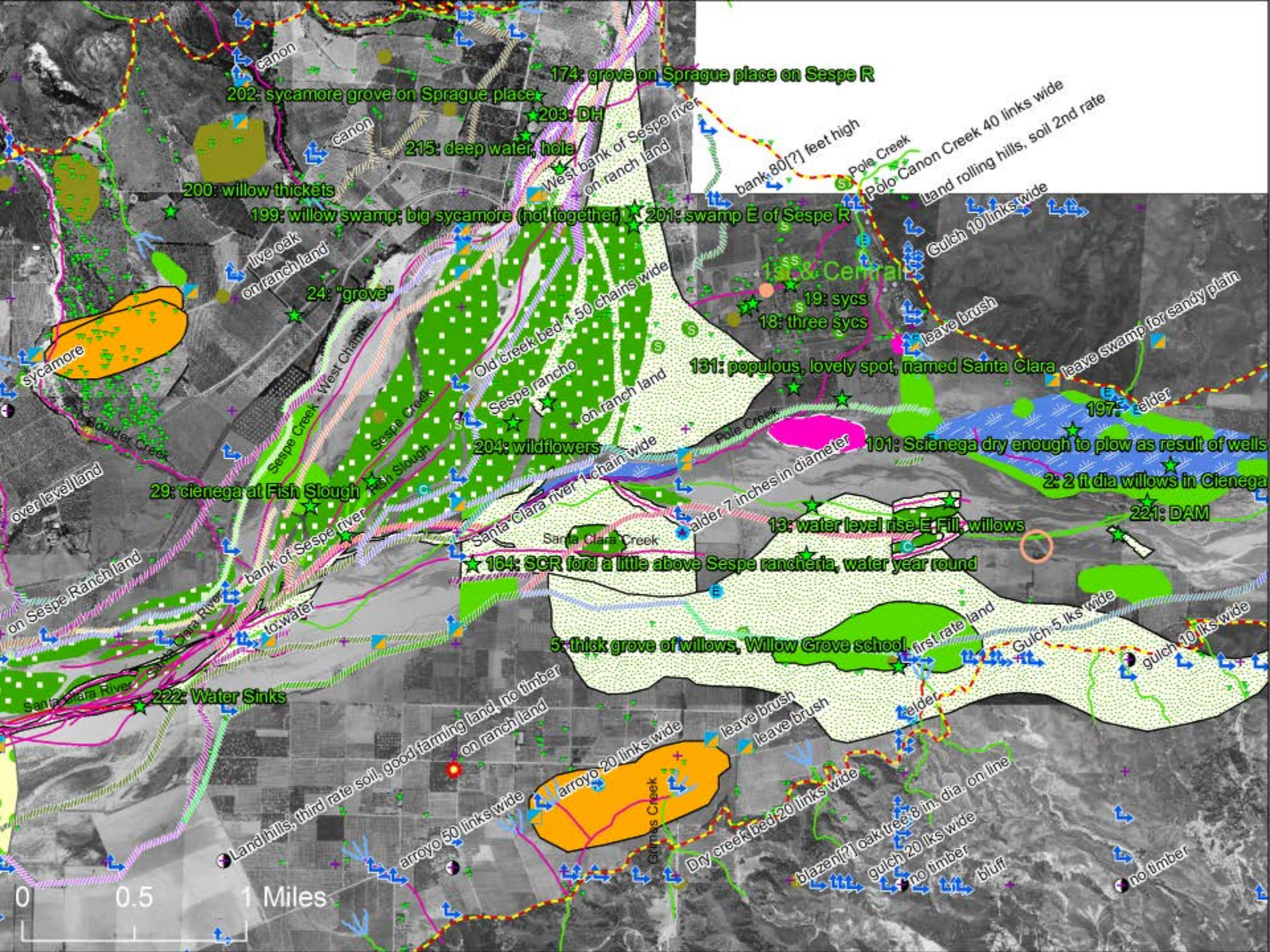
1950

"the river was filled with drift wood, forming a raft"



"nothing but tule, without a tree under which the navigator may find shade"

2000



202: sycamore grove on Sprague place  
174: grove on Sprague place on Sespe R

203: DH

215: deep water, hole

200: willow thickets

199: willow swamp; big sycamore (not together)  
201: swamp E of Sespe R

live oak on ranch land

24: "grove"

Old creek bed 1.50 chains wide  
Sespe rancho on ranch land

bank 80(?) feet high

Pole Creek

Polo Canon Creek 40 links wide  
Land rolling hills, soil 2nd rate

Gulch 10 links wide

leave brush

leave swamp for sandy plain

sycamore

over level land

29: cienega at Fish Slough

on Sespe Ranch land

bank of Sespe river

204: wildflowers

Santa Clara river 1 chain wide

131: populous, lovely spot, named Santa Clara

1st & Central

19: sycs  
18: three sycs

197: elder

101: Scienega dry enough to plow as result of wells

2: 2 ft dia willows in Cienega

221: DAM

13: water level rise E Fill, willows

164: SCR ford a little above Sespe rancharia, water year round

5: thick grove of willows, Willow Grove school

first rate land

Gulch 5 lks wide

gulch 10 lks wide

Land hills, third rate soil, good farming land, no timber on ranch land

arroyo 50 links wide

arroyo 20 links wide

Gilmas Creek

leave brush

leave brush

elder

Dry creek bed 20 links wide

blazen(?) oak tree 8 in. dia. on line

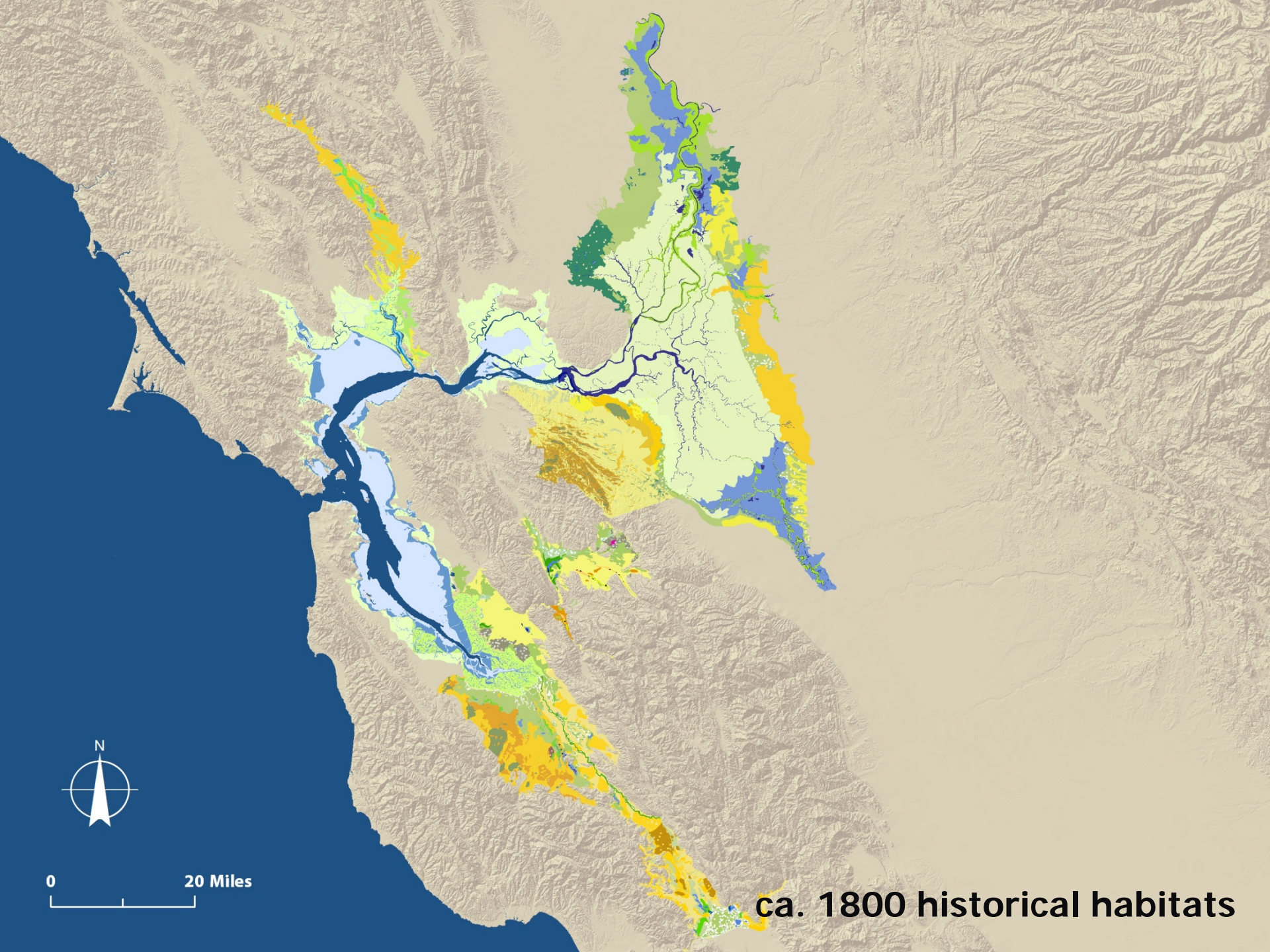
gulch 20 lks wide

no timber

bluff

no timber

0 0.5 1 Miles



**ca. 1800 historical habitats**

# Fluvial channel network change

## Historical Coyote Creek Drainage Network

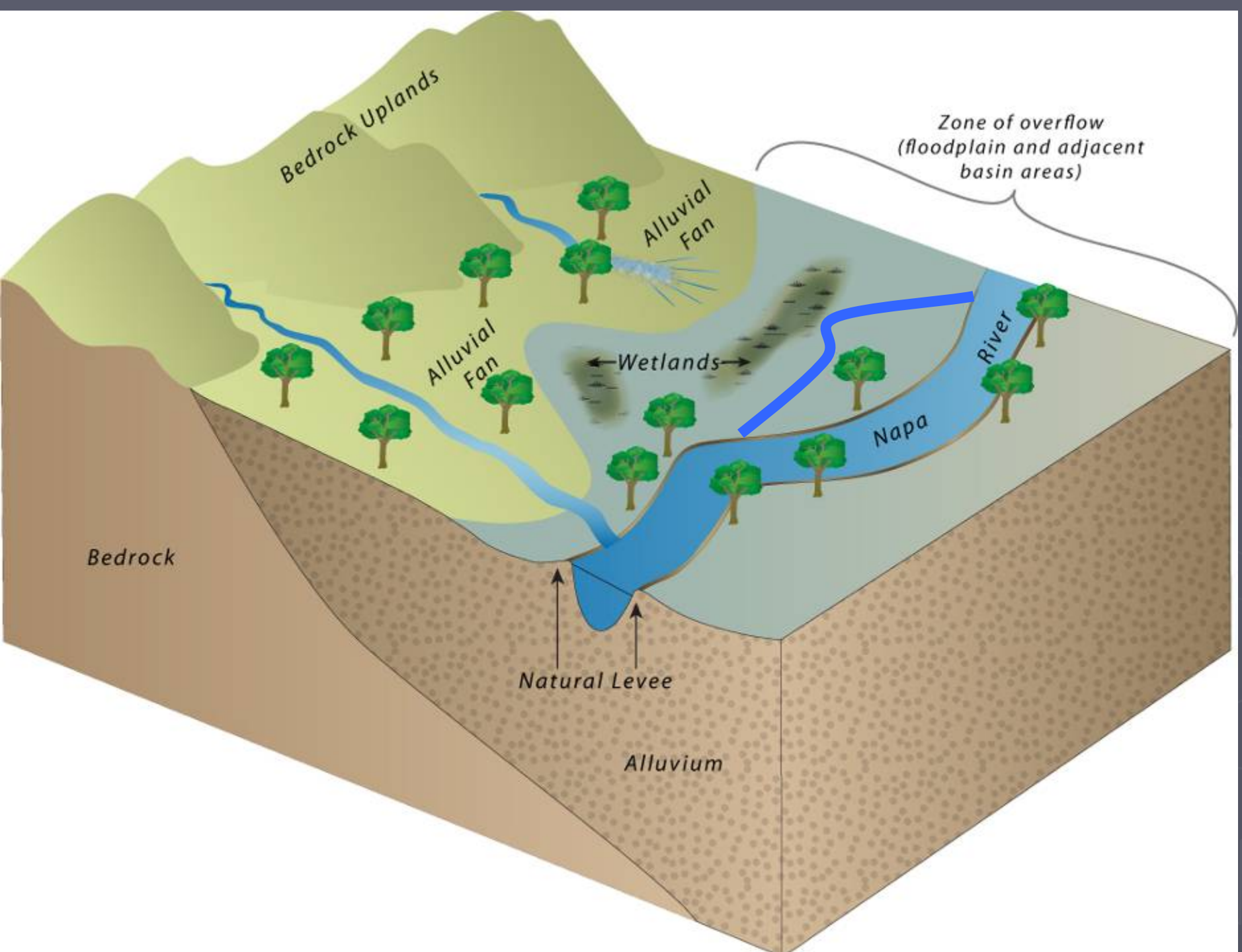


San Jose

# 1800:

"disconnected"  
system





# Fluvial channel network change

## Modern Coyote Creek Drainage Network

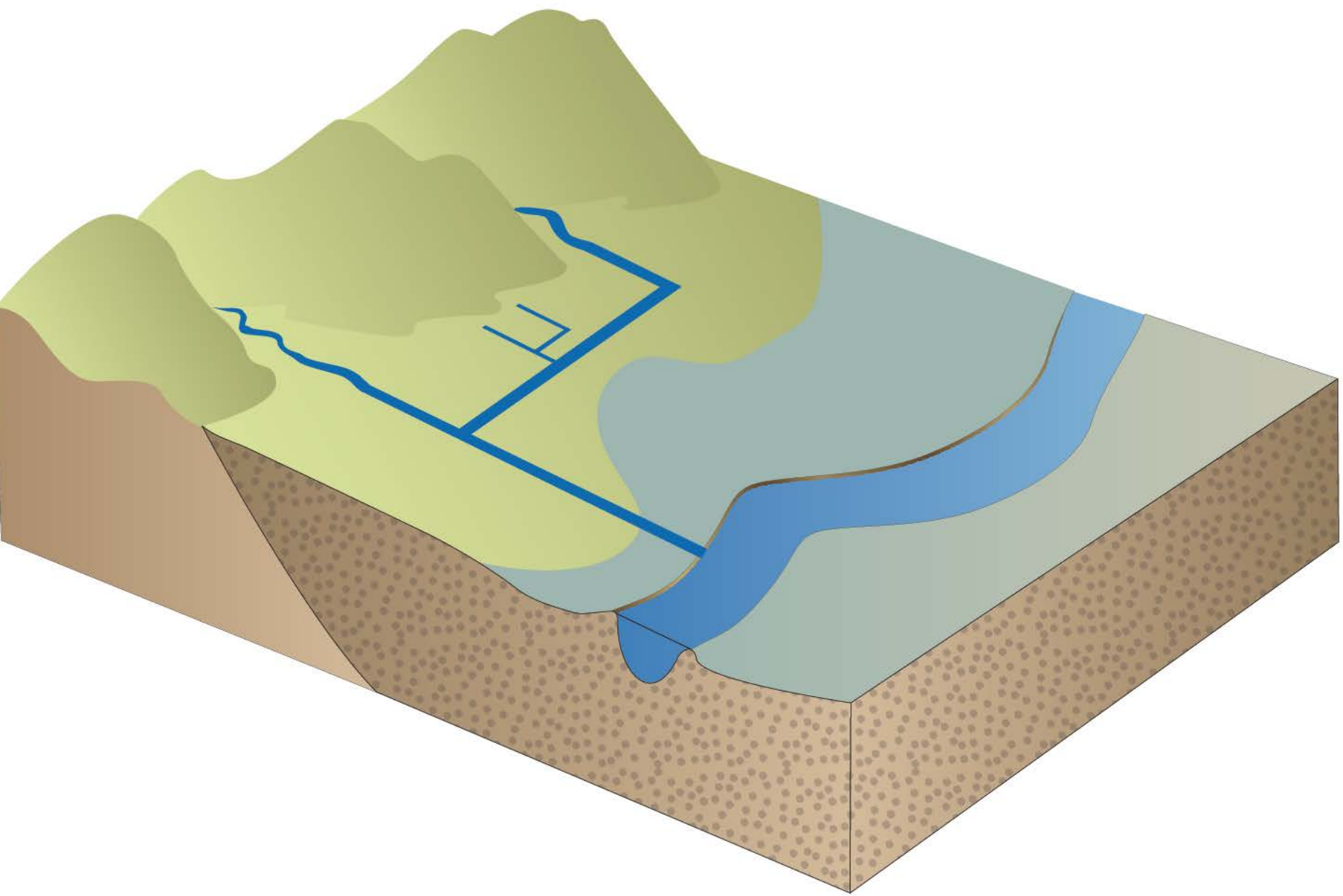


San Jose

**2005:**  
“increased  
connectivity”







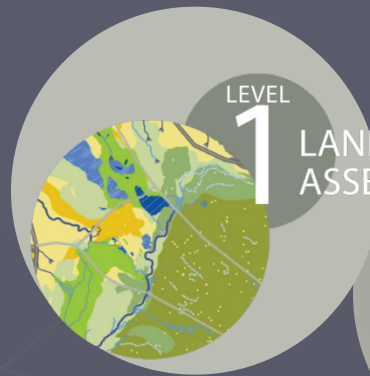
**The Emerging Watershed Approach**  
**To Aquatic Resource Impact Avoidance, Minimization, and**  
**Mitigation**  
**Pursuant to the USACE 404(b)(1) Guidelines and CA 401 Program**

**Next step:**

**Broaden definition of watershed profiles to**  
**incorporate cultural resources/cultural**  
**landscapes/Native management**

# "1-2-3 Framework" for comprehensive assessment of aquatic resources

Landscape-level tools:  
Map-based inventories  
Landscape analysis



LEVEL

1

LANDSCAPE  
ASSESSMENT

Historical Ecology/  
Cultural Landscape analyses

California Rapid  
Assessment Method  
(CRAM)



LEVEL

2

RAPID  
ASSESSMENT

Landscape and Watershed  
profiles of natural and  
cultural resource condition

Hydrography, sediment supply,  
biological diversity, etc.

LEVEL

3

INTENSIVE  
ASSESSMENT



Site inventories, oral envir. histories,  
Archaeology, place name reconstr.,  
resource management reconstructions,  
etc.

## Physical sources

[Academic research]

### *Archaeological sources*

Faunal assemblages

**Macro and microscopic botanical  
remains**

Pollen/phytoliths/starches

**Artifact residue analyses**

### *Ethnographic Information*

Place names

Species specific material uses

Specific harvest/management practices

Terrestrial and aquatic

Medicines

Paths and trails

## Community sources

[Tribal research]

### *Old knowledge*

Place names

**Hunting/gathering areas**

**Ceremonial sites**

**Medicines**

**Paths and trails**

**Linguistics**

### *Historic Information*

Knowledge of places

Knowledge of change

**Customary/family communal areas**

**“New” urban/rural gathering areas**



**Synthesis of  
historical landscape  
form and function**



**Landscape-level resilient  
restoration strategies**



*Conceptual models, identified  
opportunities, landscape metrics*



**Restoration  
Planning**  
(Tribes,  
Conservancies,  
DFW)



**Mitigation  
Planning**  
(Tribes, RB,  
Caltrans, EPA)



**Natural Flood  
Protection**  
(Tribes, Flood  
Control Districts)