Learning from the Landscapes of the Past

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2017 Napa County Watershed Symposium

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SFEI AQUATIC SCIENCE CENTER

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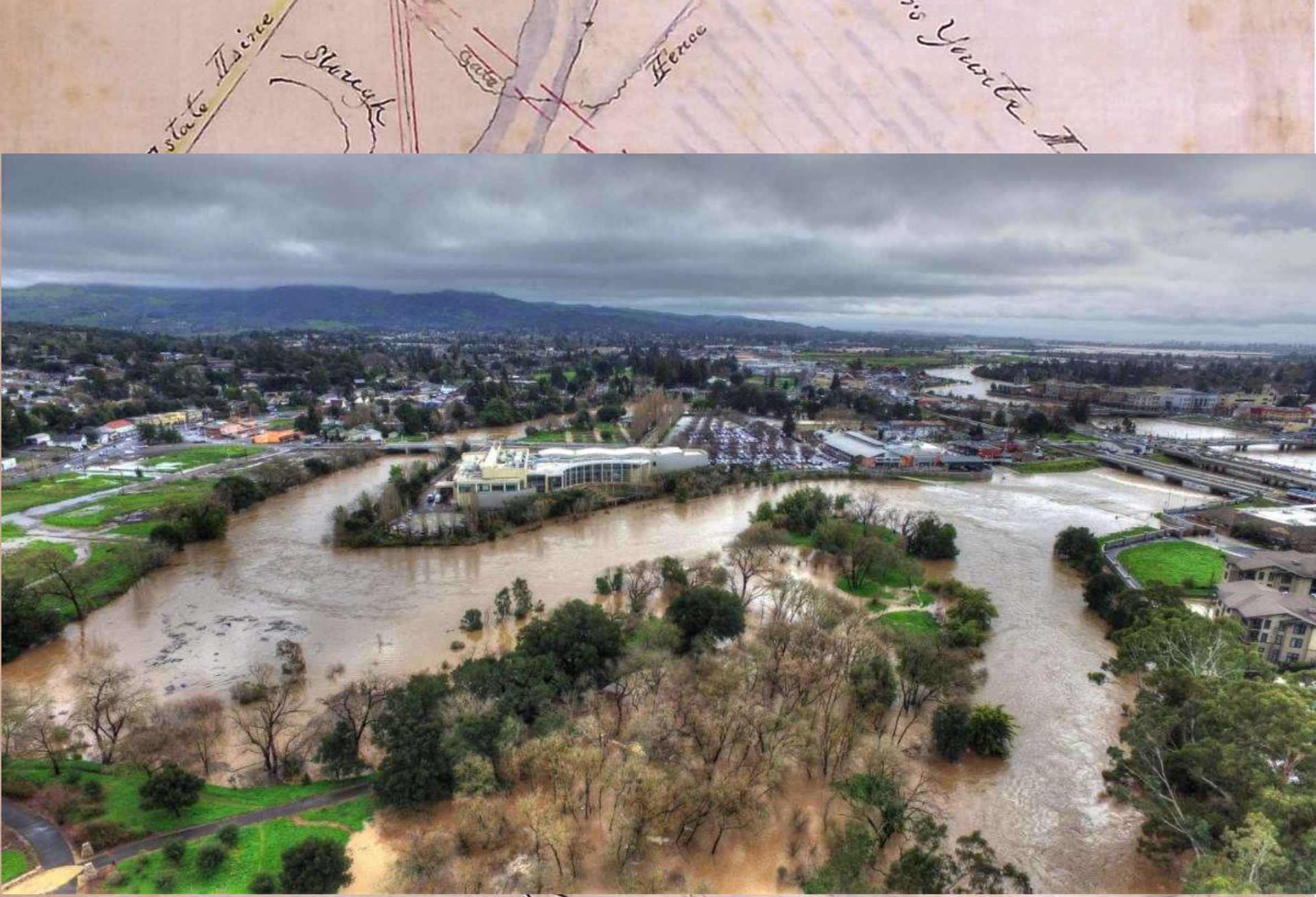
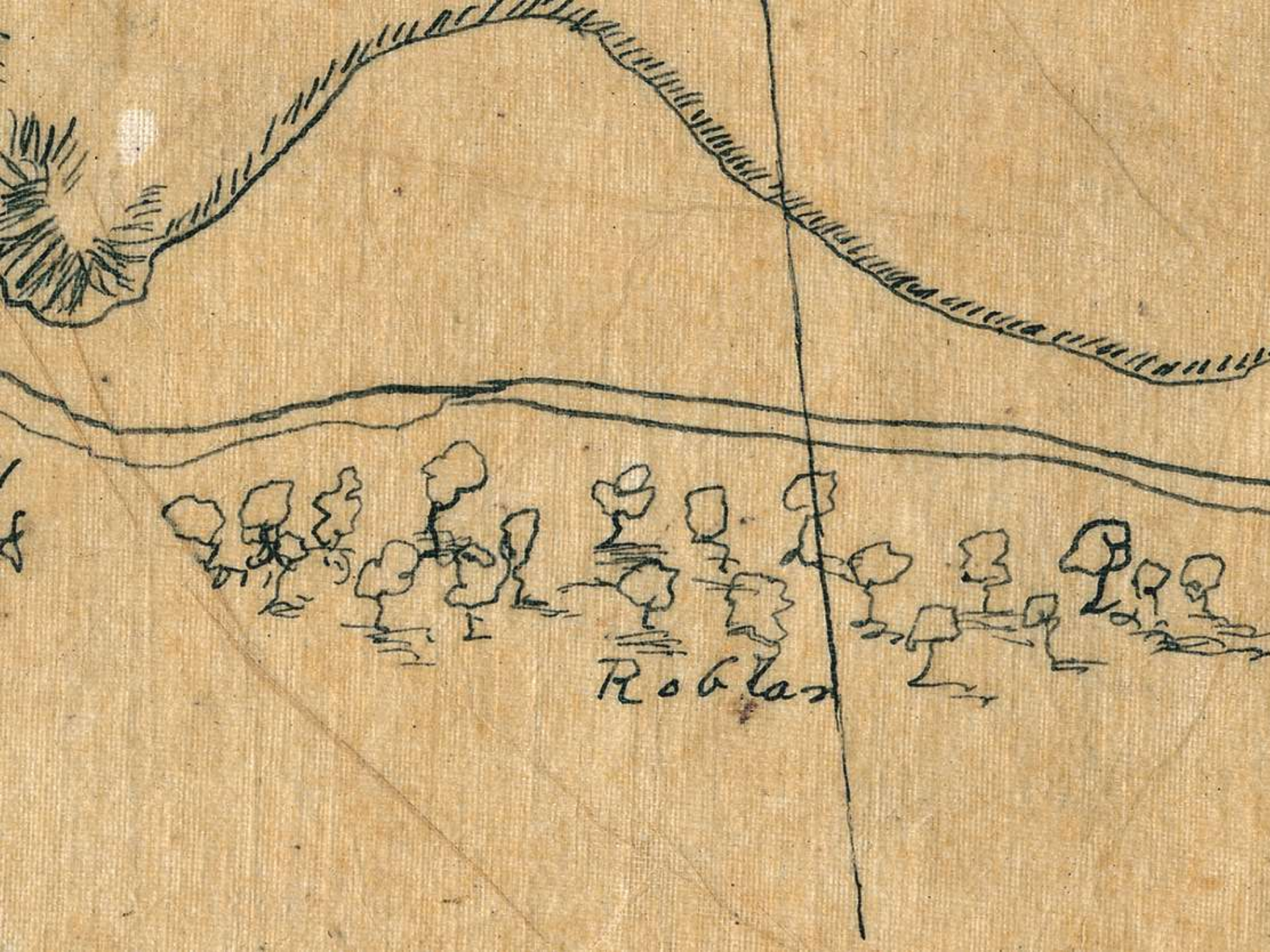



Roblar

Re-oaking the Valley

Oaks are a big part of Napa's heritage and identity. Our goal is to protect this legacy for future generations by helping ensure that new seedlings get established in areas that have been deforested (sometimes over a hundred years ago). Thanks in part to eager landowners, opportunities for re-oaking abound. RCD partners with Friends of the Napa River in programs that add

Related projects

Oak Planting Map

Oak Monitoring Team

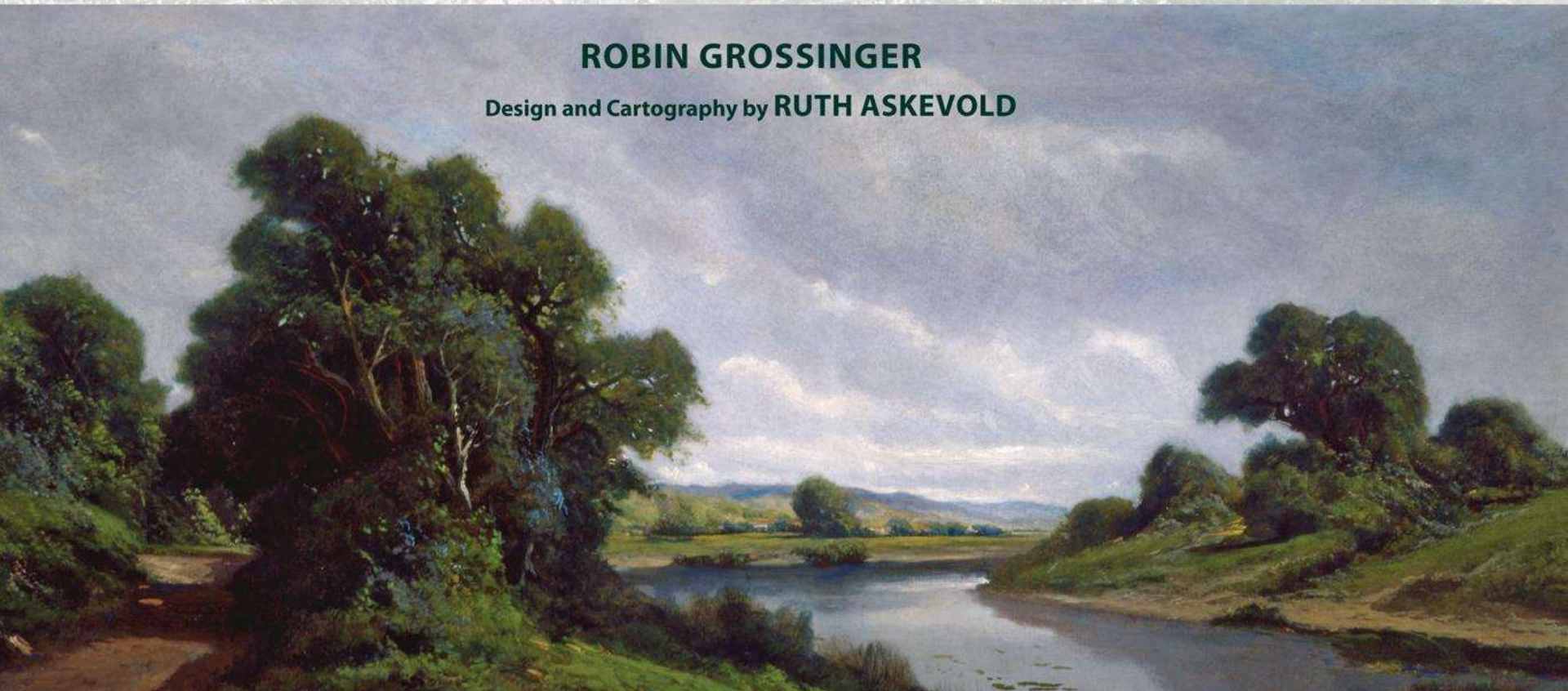
Community Oak Planting Days –

NAPA VALLEY
HISTORICAL ECOLOGY ATLAS

EXPLORING A HIDDEN LANDSCAPE OF TRANSFORMATION AND RESILIENCE

ROBIN GROSSINGER

Design and Cartography by **RUTH ASKEVOLD**



RE-OAKING SILICON VALLEY

guidelines for integrating ecologial functions INTO THE URBAN SETTING

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LANDSCAPE RESILIENCE FRAMEWORK

Operationalizing ecological resilience at the landscape scale

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Our environment is going to be a bigger challenge in the coming decades…





“Landscape Resilience”

Marshes buffer shoreline from **rising sea levels**

Urban forests reduce **heat**, provide **shade**, and store **carbon**

Creeks with floodplains **reduce flood risk**

Native trees and landscaping is **drought tolerant**, **connects people to nature**, and makes city **unique**

We can make our landscapes more resilient. Historical Ecology helps us see how.

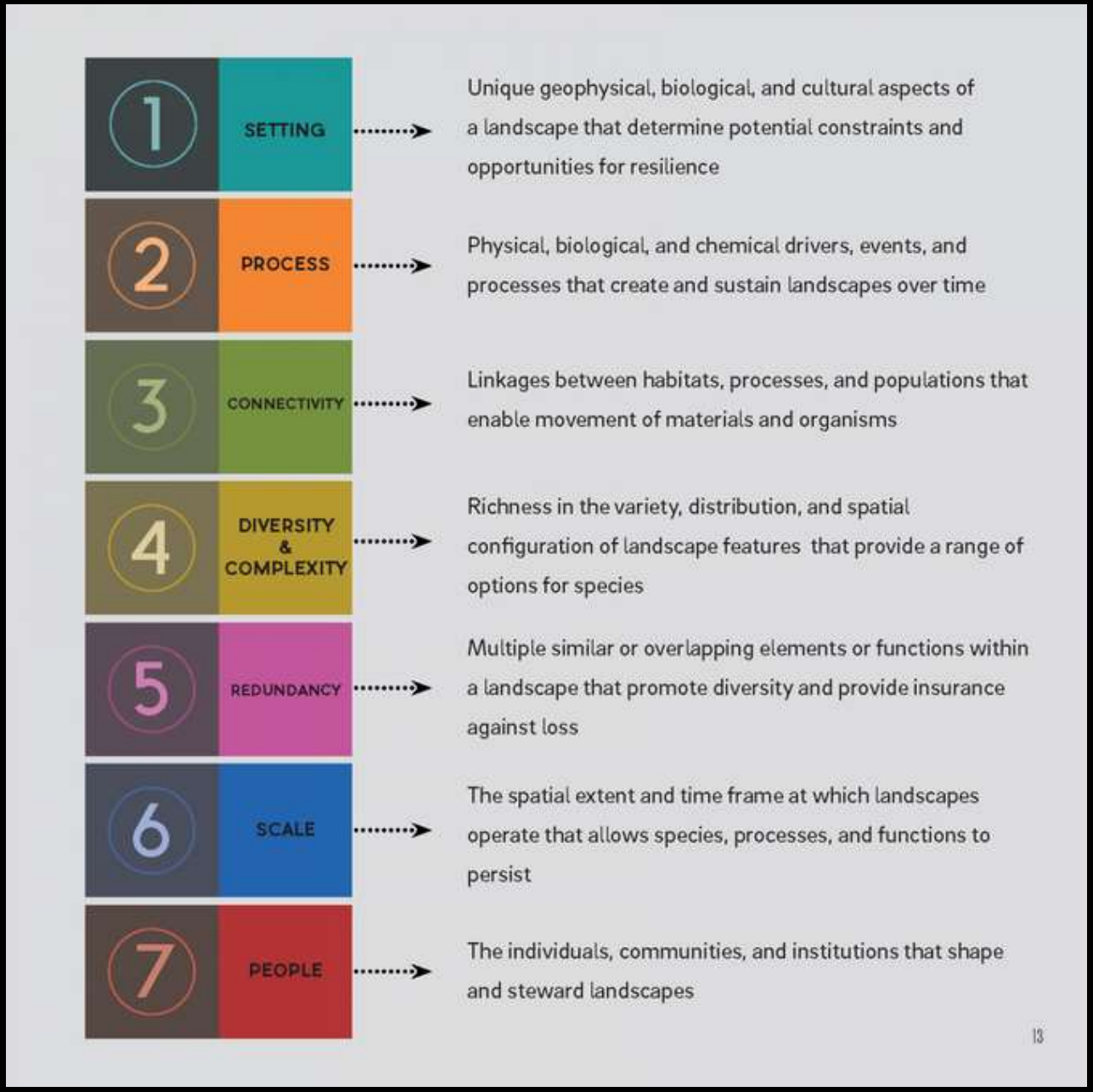
Restoring Habitats

Restoring Resilience

An ecologically resilient landscape…

- Supports biodiversity and the ecological functions that sustain it over time
- Can persist, recover, and adapt in the face of climate change and other anthropogenic stressors

Landscape Resilience Framework



Beller E, Spotswood E, Robinson A, Anderson M, Higgs E, Hobbs R, Suding K, Zavaleta E., Grenier L, Grossinger R, *in prep.*


SETTING
regional value of local salmonid runs
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

PROCESS

Drawing by Brian Maebius
(July 2012 *Bay Nature*)

DIVERSITY, CONNECTIVITY

oak species, genetics, distances

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Re-oaking the Valley

Oaks are a big part of Napa's heritage and identity. Our goal is to protect this legacy for future generations by helping ensure that new seedlings get established in areas that have been deforested (sometimes over a hundred years ago). Thanks in part to eager landowners, opportunities for re-oaking abound. RCD partners with Friends of the Napa River in programs that add

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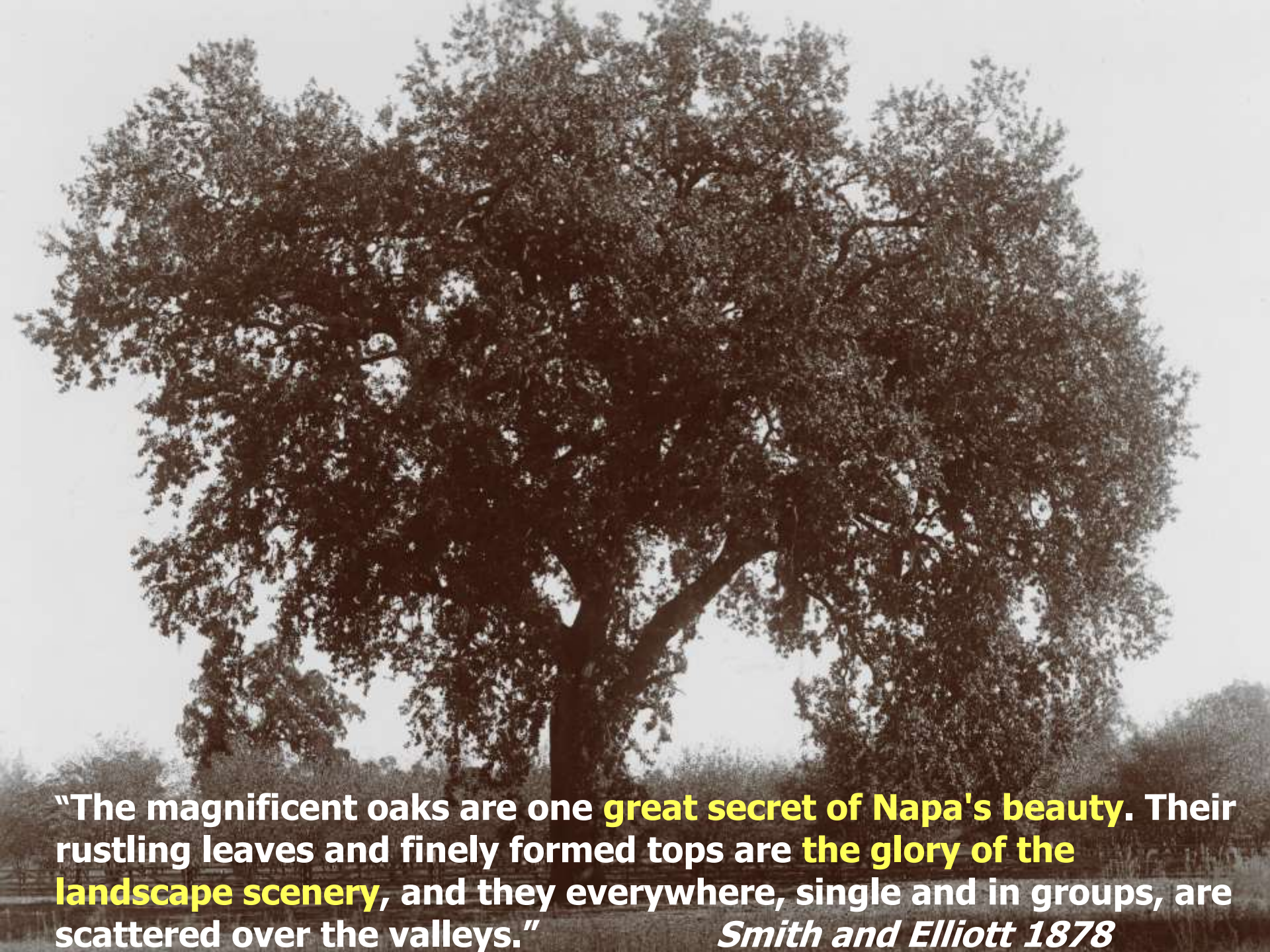
“Re-oaking”: reincorporate oak ecosystems within developed landscapes

- Greatly lost throughout state, esp Valley oak
- Foundation species in California ecosystems
- Drought-tolerant
- High social and cultural value



"The magnificent oaks are one great secret of Napa's beauty. Their rustling leaves and finely formed tops are the glory of the landscape scenery, and they everywhere, single and in groups, are scattered over the valleys." *Smith and Elliott 1878*

1860: “Napa is shaded by an oak grove not yet demolished .”

-- Sacramento Daily Union 1860

1861: “the fields have scattered over them many most grand oaks, which would be an ornament to any park with their broad spreading branches, drooping at the ends like those of an elm--majestic trees.”

-- Brewer 1861

“The pretty little village of St. Helena, with its 50 or more houses, many of them neat and white, nestled among grand old oaks, was very picturesque.

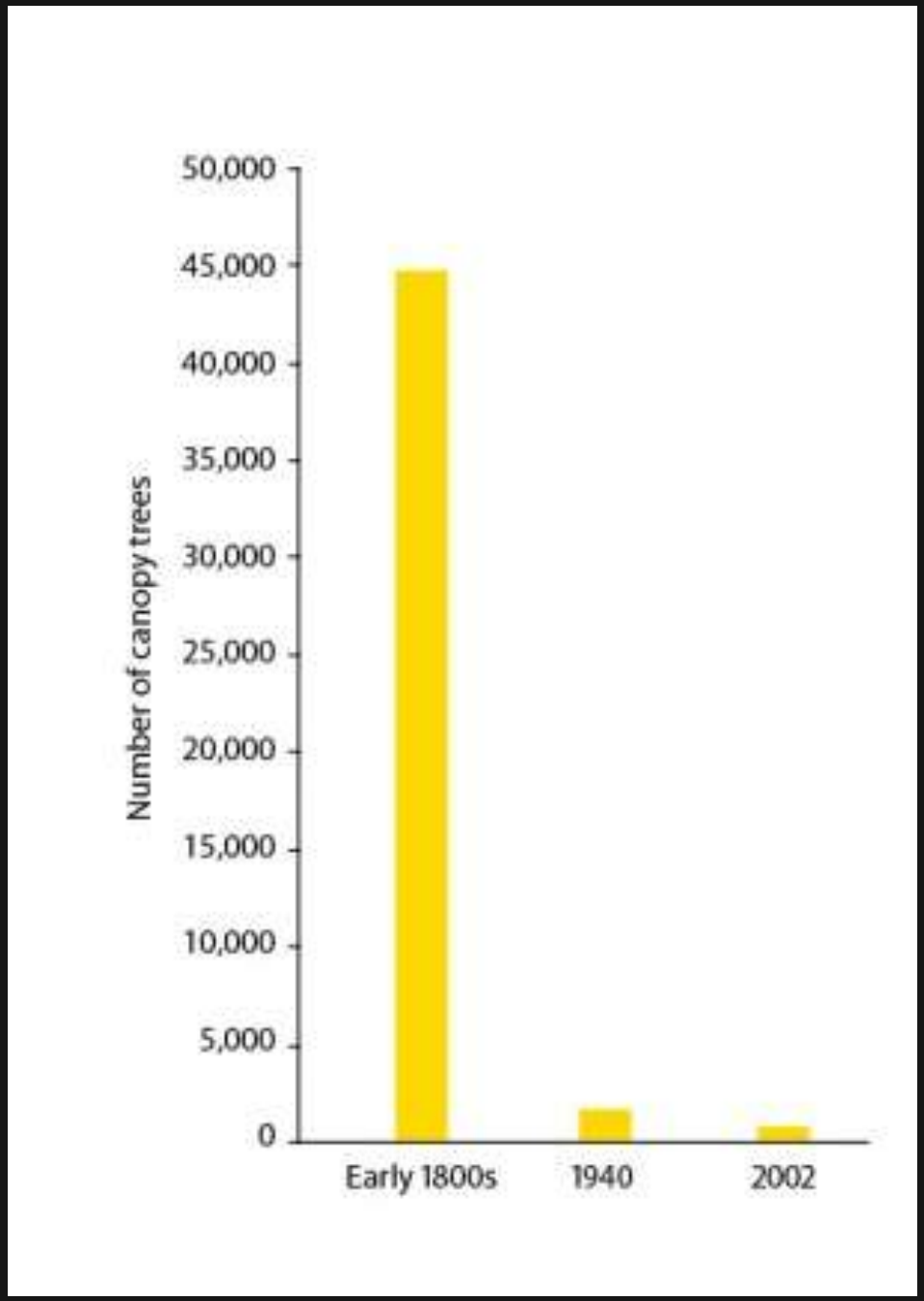
– Smith and Elliott 1878

“most useful in the protection they afford from the summer heat .”

-- description of Krug estate 1885

“We could walk around town under shade… Everyone had an oak in their yard.”

-- Babe Learned


50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Number of canopy trees
Early 1800s
1940
2002

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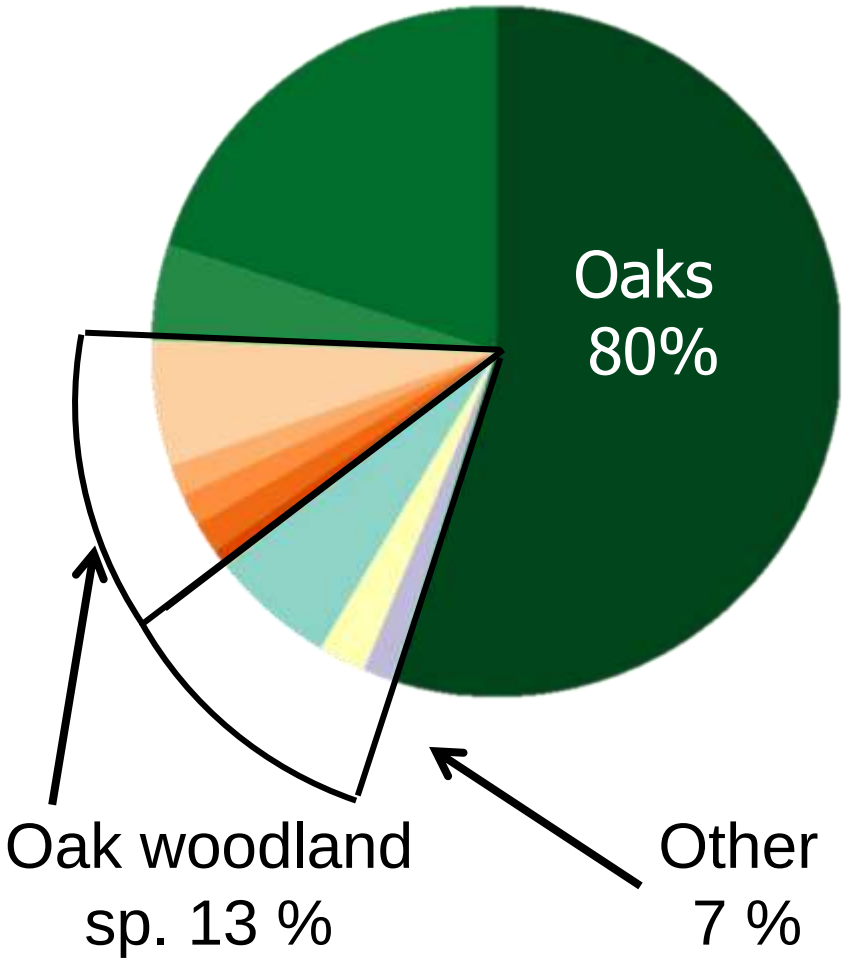
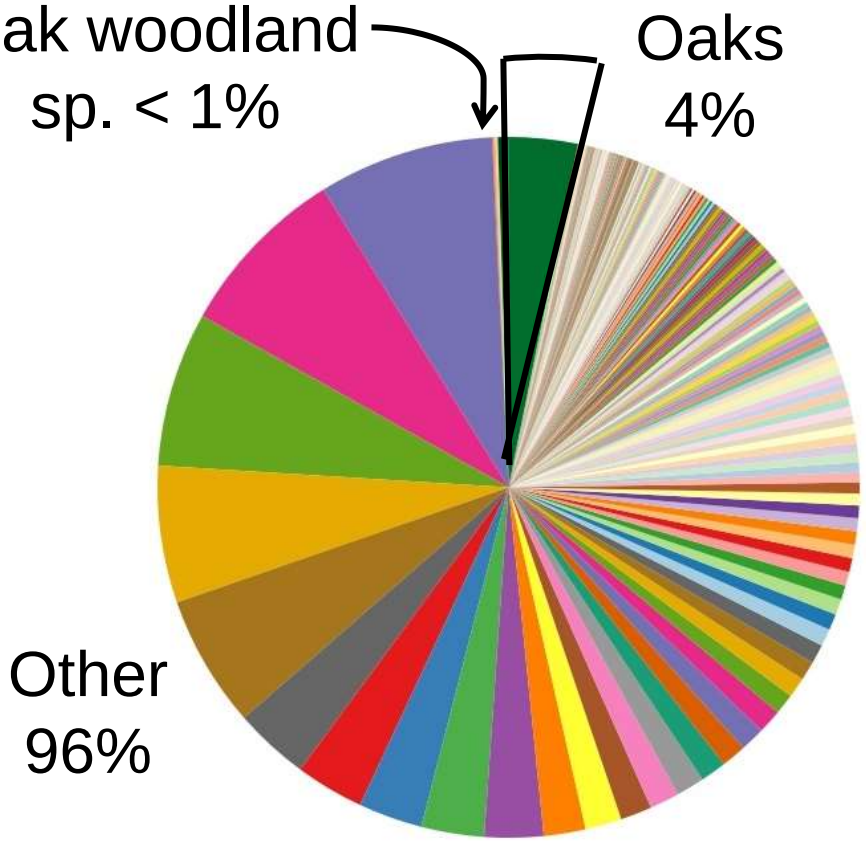
Forest composition: Change

Historical ~ 20 species





Modern

~ 400 species

HERBIVORY
buds
sap
catkins
Acorn Woodpecker

GRANIVORY
acorns
Acorn Woodpecker
California ground squirrel

SUPPORT
burrow creation

COMMENSALISM
host
mistletoe
gall-forming wasps

HABITAT CREATION
dense foliage
many insects

INSECTIVORY
by birds

SUPPORT
nest site
cavity excavators
Acorn Woodpecker

HABITAT CREATION
dead limbs
dead trees
granaries for Acorn Woodpeckers

PREDATION
by birds, snakes

DISPERSAL
acorn consumption
Scrub Jay

HABITAT CREATION
downed logs
leaf litter
California newt estivation

SCAVENGING
by turkey vulture

PHYSICAL
erosion protection
water flow regulation

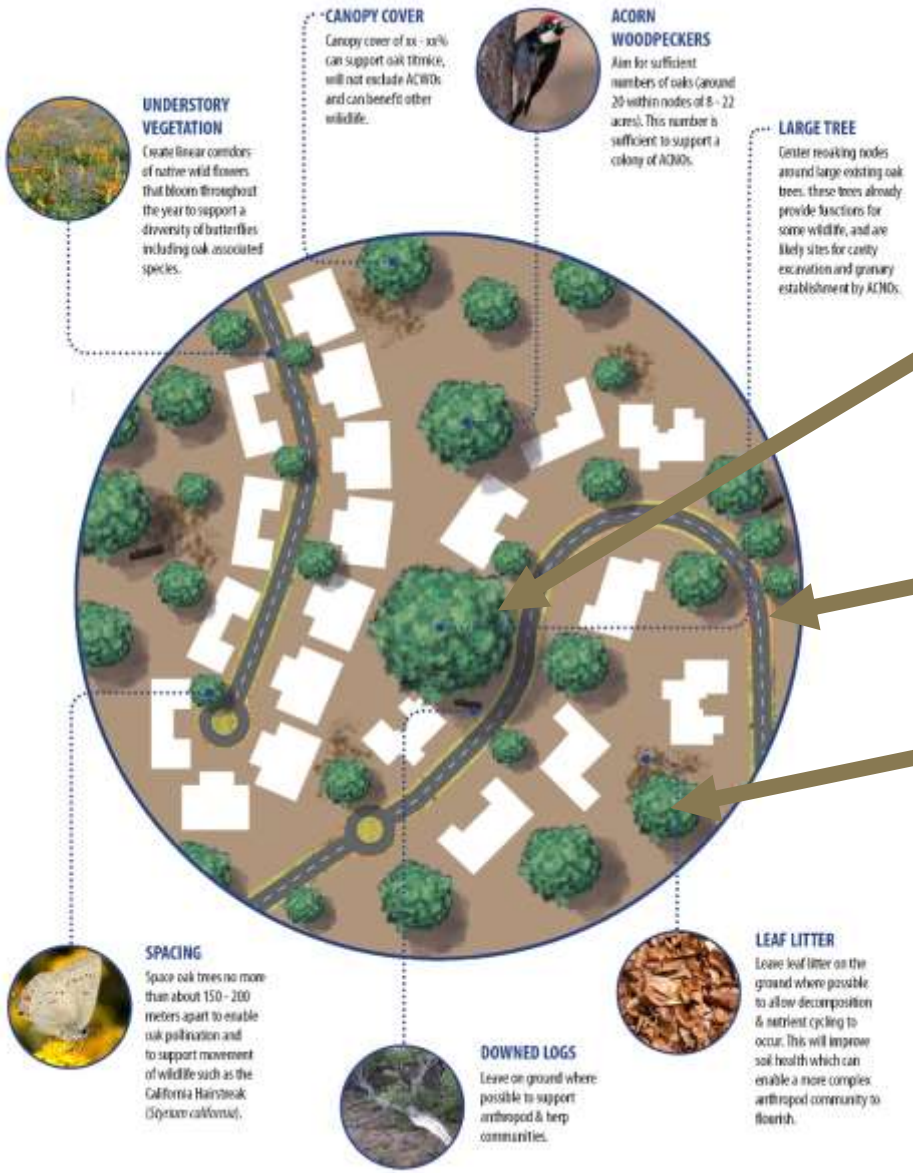
GEOCHEMICAL

NUTRIENT CYCLING
leaf litter input
nutrients from rain drip
soil moisture retention
(during dry season)

DECOMPOSITION
support for
microbial community

CULTURAL/SOCIAL
carbon sequestation
natural beauty
recreation
biophilia

Re-oaking Guidelines



Center nodes around large oak trees

Create linear strips of herbaceous vegetation

Place trees < 200 m apart

Aim for 20 trees within nodes

Guidelines: Trees

- Increase proportion of oaks in urban forest
- Increase native oak diversity
- Increase native oak woodland diversity with oak-associated trees
- Plant valley oak if coast live oak is already common
- Plant oaks within 200 m of each other
- Protect large trees
- Use primarily local genetic stock with small percentage of genes from hotter drier areas

Guidelines: Wildlife

- Create nodes of around 17 acres with at least 20 oaks
- Center nodes around existing large trees
- Leave mistletoes intact
- Leave downed logs and leaf litter on ground
- Protect granary trees and trees with cavities
- Promote nest boxes

Local Re-Oaking Visions

Appropriate (and not appropriate) sites

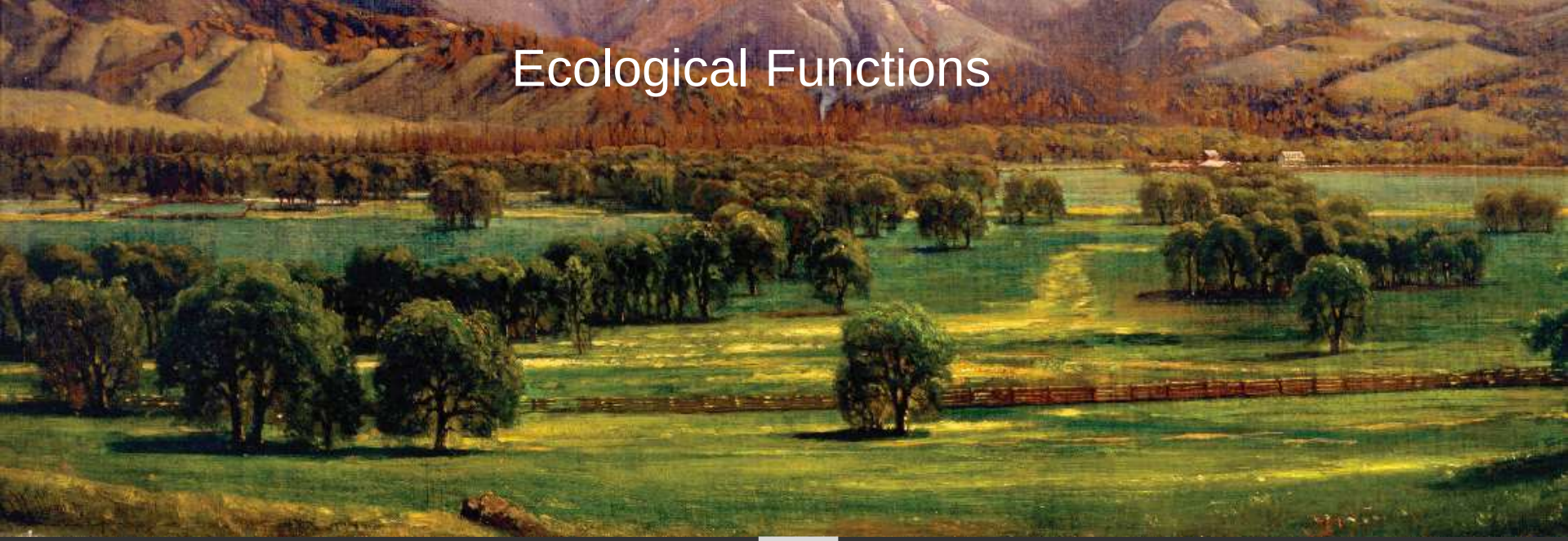
Implementation and maintenance approaches

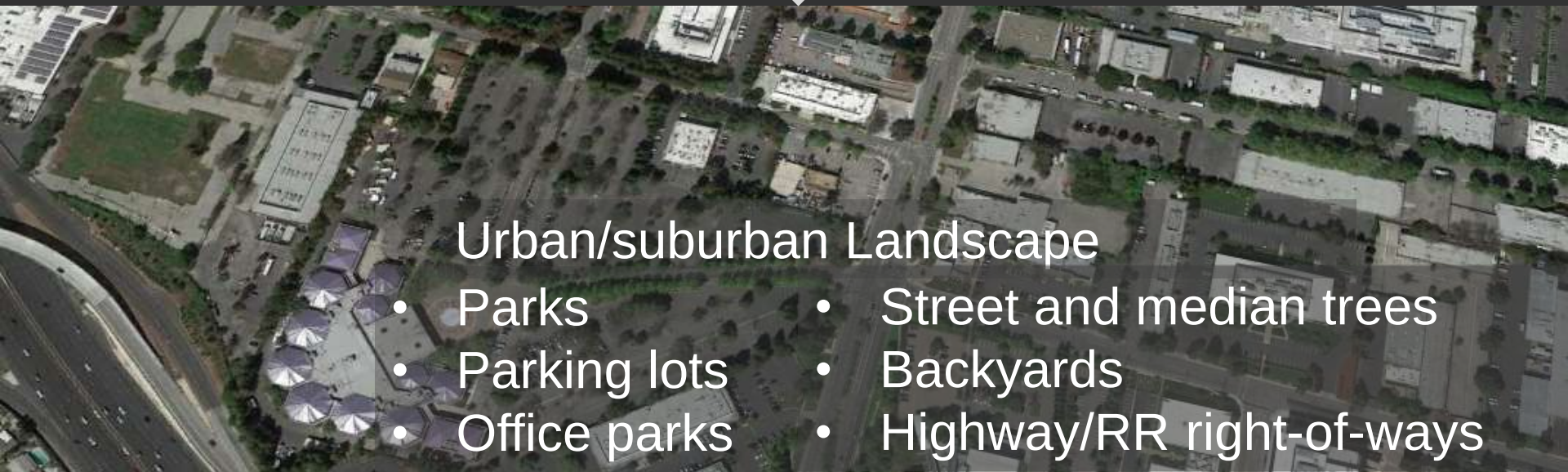
Where to create shade (residential) vs leave sun (agricultural)

Target densities for trees, connectivity to creeks/hills

Associated landscape elements for ecological functions (granary trees, foraging sites)

Ecological Functions





Urban/suburban Landscape

- Parks
- Parking lots
- Office parks
- Street and median trees
- Backyards
- Highway/RR right-of-ways


1868
OFFICE


Heritage Oak at Trefethen Family Vineyards

THANK YOU

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