

Native Northern California Black Walnut

Juglans hindsii

Heritage Walnut Conservation Project



FRIENDS OF THE CREEKS

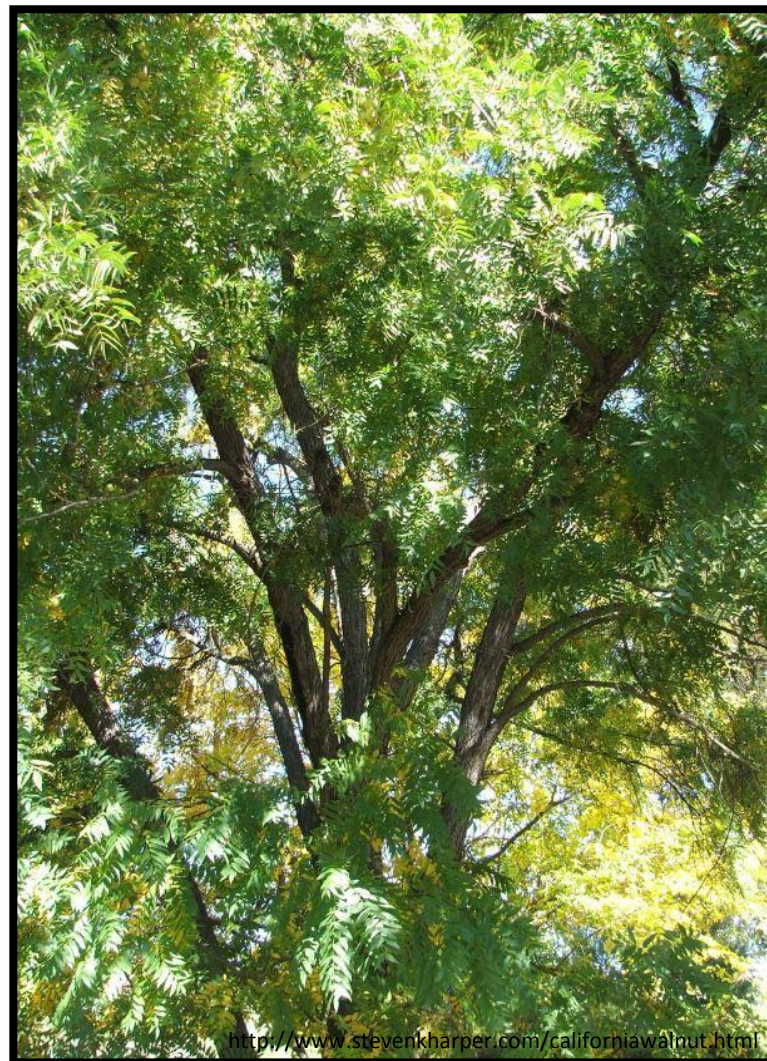
An Appeal for Funding
to Support Critical Research to
**Identify Rare Heritage Native
Northern California Black Walnut Trees**
throughout the historic core habitat
of Contra Costa County.

Tax Deductible Donations Toward the
\$10,000 Goal

Accepted Through June 25, 2015

Donate Online at
friendsofthecreeks.org

The Native Northern California Black Walnut Conservation Partnership
c/o Friends of the Creeks
A 501(c)(3) Nonprofit Organization
236 Warwick Drive
Walnut Creek, CA 94598



<http://www.stevenkharper.com/californiawalnut.html>

Support the Search for Our Native Heritage Trees!

Target Sample: 60 Trees @ \$1,000 per 6 Trees

**Northern California Black Walnut
Conservation Project**

Juglans hindsii

*Natural groves of native trees,
could you help us find them please?*

*Are they hidden in our midst?
Or do they no longer still exist?*

*Only DNA testing can tell us for sure
if walnuts are hybridized
or genetically pure.*

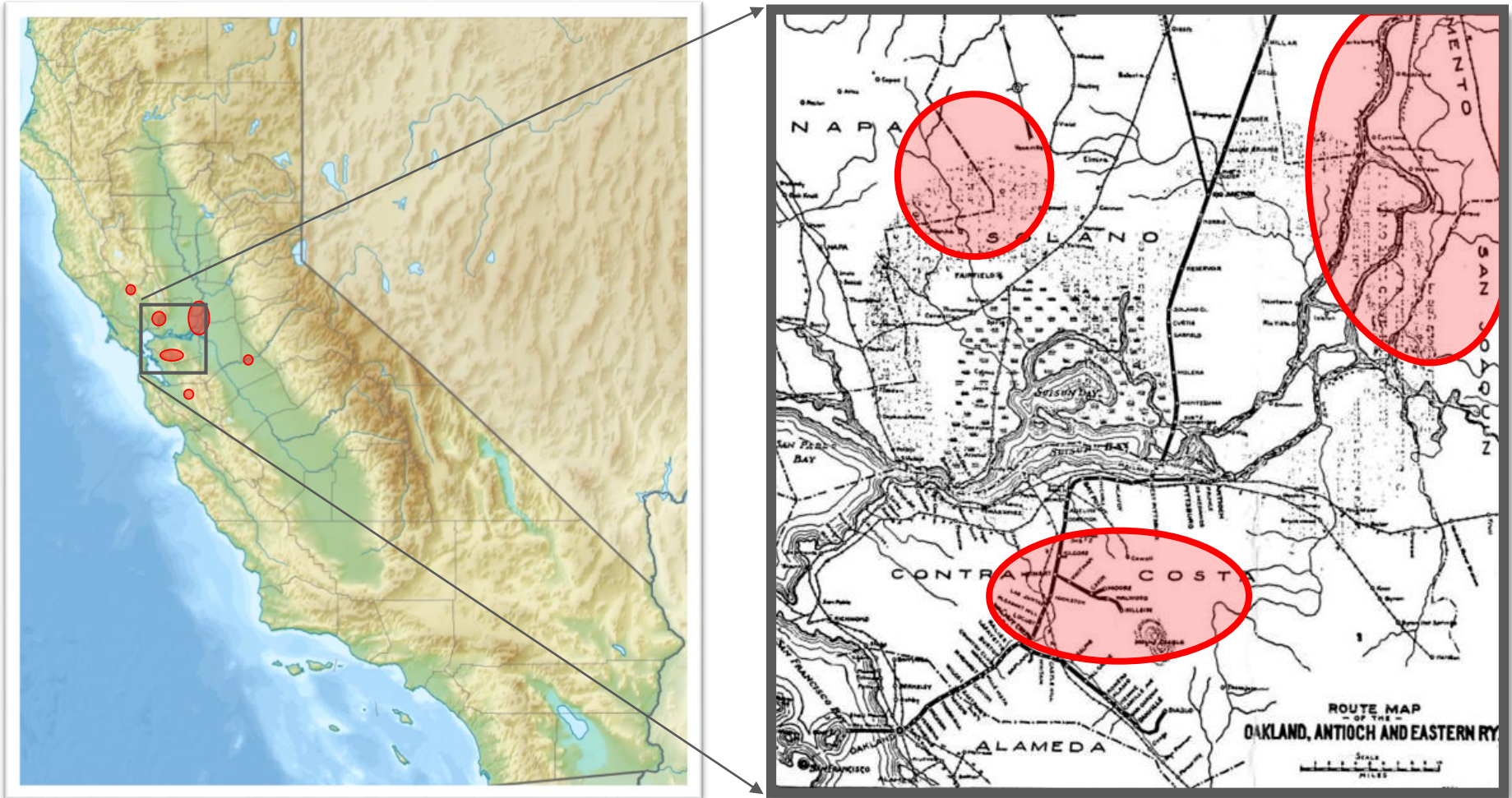
*Walnuts, walnuts everywhere,
Juglans hindsii, are they rare?*

*Is there a native nut to spare?
Support our research if you care!*



Only one kind of walnut tree grew in Northern California when the pioneers arrived with other orchard varieties in 1840.

Indigenous *Juglans hindsii* groves were historically located in five isolated regions.



MAP: www.calarchives4u.com/history/contracosta/1917-ch23.htm

(Present Day Contra Costa, Napa, Alameda, Sacramento and San Joaquin Counties)

The Native Northern California Black Walnut is a **Rare, Seriously Endangered, Critically Imperiled Plant** in California and the World

Northern California Black Walnut *Juglans hindsii*

California Native Plant Society **Rare Plant Rank 1B**

- Endemic / Native to California
- Rare throughout their range
- Declined significantly over the last century

California Department of Fish and Wildlife **Listed Endangered Species**

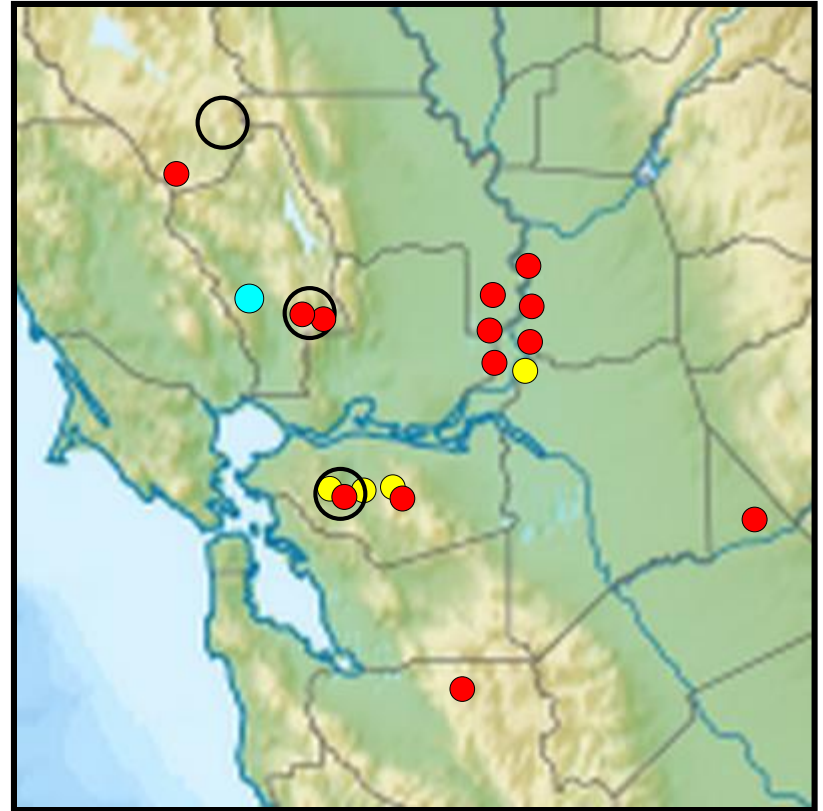
- Listed under the California Endangered Species Act, meeting definitions of California Department of Fish and Wildlife Code Sections 2062 and 2067
- Inventoried in the official California Natural Diversity Database (**CNDDDB**)
- Mandatory consideration during preparation of environmental documents relating to CEQA

Only Three Known Native Old Growth Stands Remain

Northern California Black Walnut

Juglans hindsii

Remaining
Indigenous
Old Growth
Stands



- Possibly Pre-1840:
Per 1892-1963 Documents¹
- 1892-1963: Documented¹
- 2005-2011: Presumed Extant²
- 2014: Verified Genetically Pure³

¹USDA (1976)

²CDFW (2014)

³Potter, D., UC Davis; Napa County (2010)

<http://en.wikipedia.org/> (2014)

Northern California Black Walnut Trees Now Grow throughout the State

Move to an area of interest, and zoom in. Click on the map to update

Juglans hindsii

Tree

native to California



© 2009 Neal Kramer

Northern California black walnut

JUGLANDACEAE



© 1995 Saint Mary's College of California

Cell size: 15 arc minutes



update

Show grid

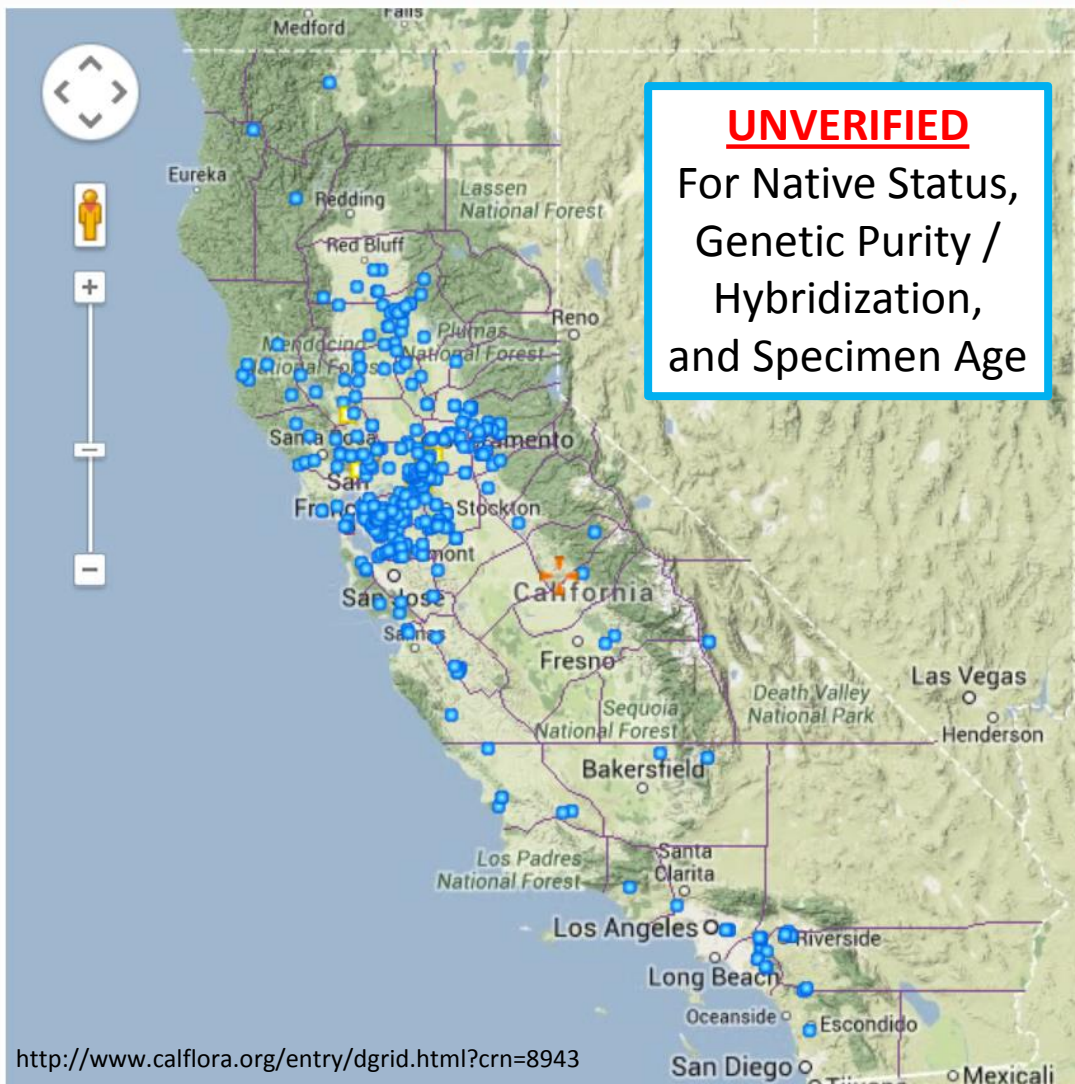
Highlight cells where plant is present

Show individual observations

415 records

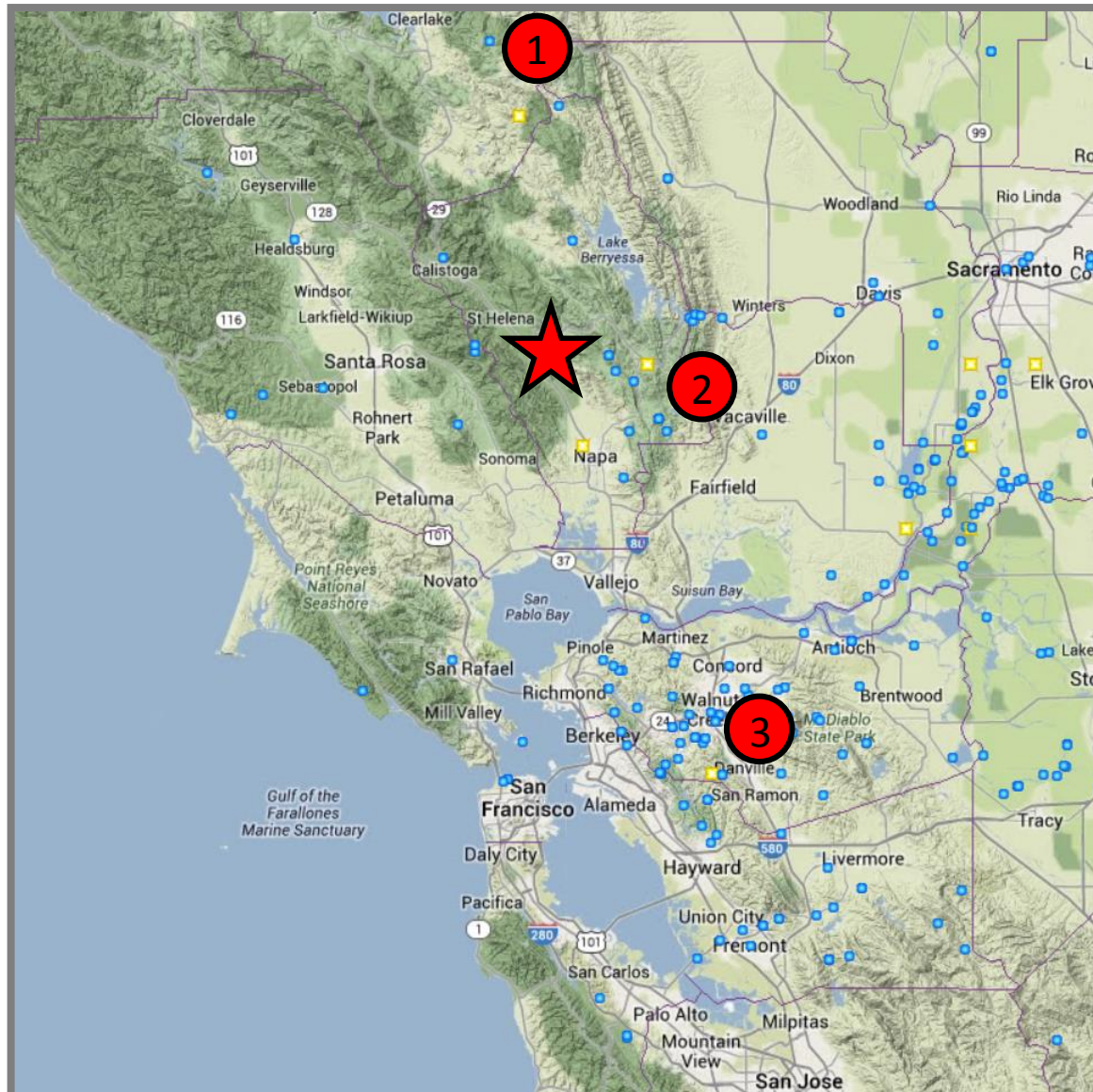
point observations

quads



So are *Juglans hindsii* Black Walnuts Rare or Not?

Northern California Black Walnut



CNDDDB Database

3 Official Remaining Native Groves

VERIFIED NATIVE

Original old growth

Northern California Black Walnuts
existing in Historic Core Habitats



Cal Flora Database

415 Tree Records

NATIVE STATUS UNVERIFIED

Degree of genetic purity and
hybridization is unknown



Swanson Vineyards

13 Old & Young Trees

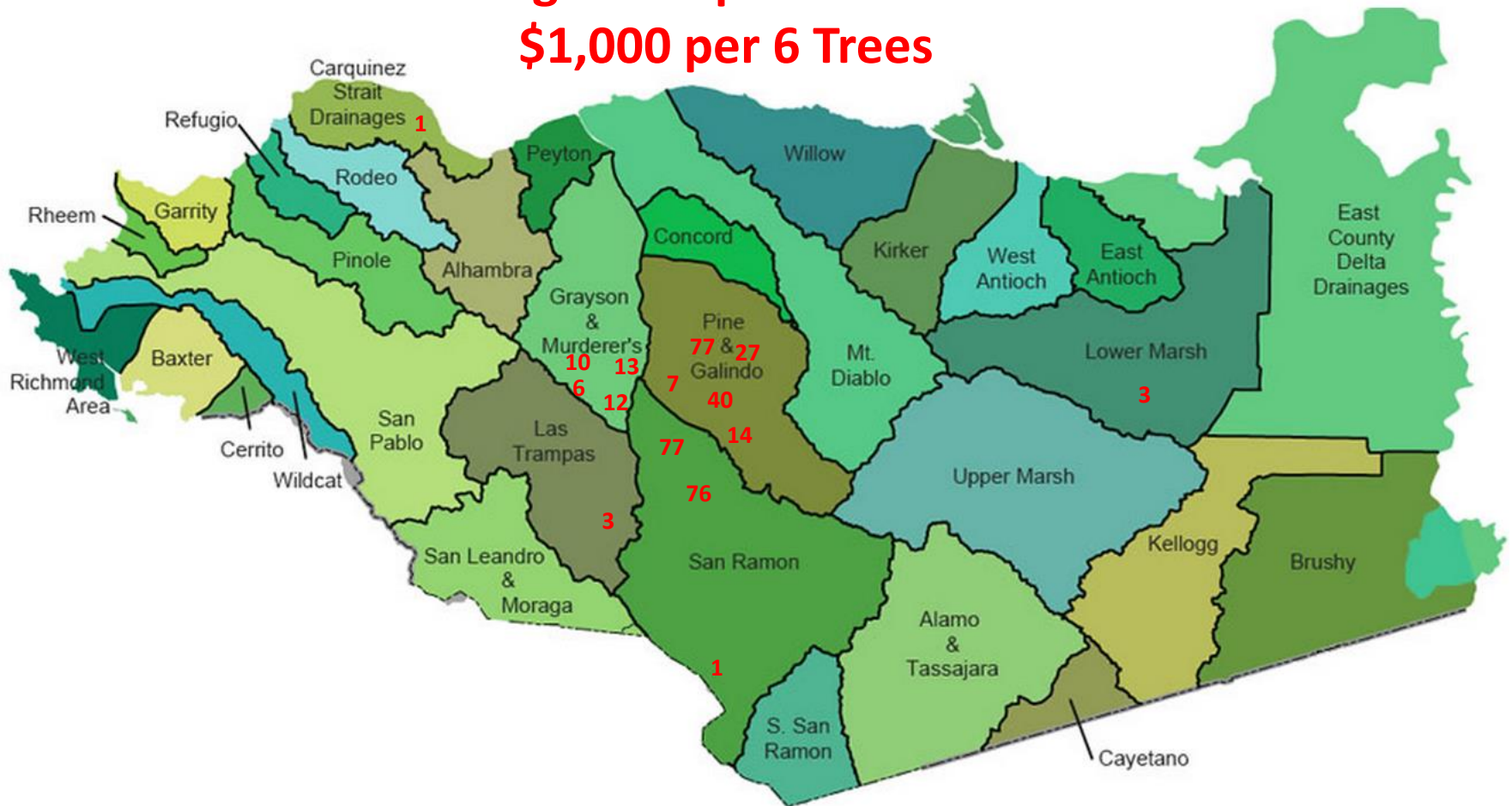
VERIFIED NATIVE GENETICS

Genetic purity
tested by UC Davis Lab

Known Priority Candidate *Juglans hindsii* Heritage Trees
to Field Sample and Test DNA to Verify Native Species Status

**Do you know where to find another
big old Northern California Black Walnut tree?**

**Target Sample: 60 Trees
\$1,000 per 6 Trees**



Contra Costa County Watersheds

The Roots of the California Walnut Orchard Industry

Northern California Black Walnut

Juglans hindsii

The California walnut orchard industry literally grew out of those few native Northern California Black walnut groves existing in the 1800s.



Uniquely Californian

Because Northern California Black Walnuts are native to California, they are best adapted to growing in the local soil, habitat, and climate.

Luther Burbank

“The Plant Wizard”

In the late 1800s, Luther Burbank grafted English Walnuts onto native Northern California Black Walnuts to develop the successful Paradox Walnut variety grown throughout California orchards. Native Northern California Black Walnuts remain prized today as rootstock for other walnut tree varieties.

Still a “Hopelessly Confused” Situation

Northern California Black Walnut

Juglans hindsii

Who says if this native tree is rare?

The CNPS defines a Northern California Black Walnut tree as a California native rare plant only if it germinated prior to 1840.

Why does a walnut tree have to be at least 175 years old to be considered native?

Walnut trees hybridize easily by wind pollination, and hybridized offspring look the same as their native parent tree.

Trees that germinated before Europeans introduced other walnut species in 1840 are most likely not to be hybridized.

Pre-1840 trees are also more likely to have propagated naturally in native habitat instead of being planted.

How else can we tell if a tree is native or hybridized?

Genetic testing can determine whether a walnut tree has the same DNA as the original native California species or if it is hybridized.

How do we protect these rare native plants?

Northern California Black Walnut

Juglans hindsii

Swanson Vineyards, Napa Valley 2014



Napa County Use Permit Application № P08-00550 & Variance № P08-00551, 2008



Steve Zalusky, Northwest Biosurvey, 2010

Who Knows?

No one really does!

Unidentified rare native trees will be lost to due old age and needed removal.

Regulation is inconsistent across jurisdictions.

Who Cares?

Northern California Black Walnut
Juglans hindsii



- Landowners
- Native Plant Scientists
- Walnut Growers
- Resource Preservationists
- Environmental Regulators

Why?

Northern California Black Walnut
Juglans hindsii

Not knowing the status of the resource results in costly lost opportunities!



Ecological, Scientific and Commercial Benefits to Proactive Heritage Walnut Population Assessment and Recovery

- Rare Plant Resource Preservation and Recovery
- Conservation Science Advancement
- Guidance to Provide Regulatory Clarity and Consistency
- Permit Streamlining
- Community Engagement Opportunities
- Commercial Rootstock Genetic Diversification Source Expansion

What do We Need to Know?

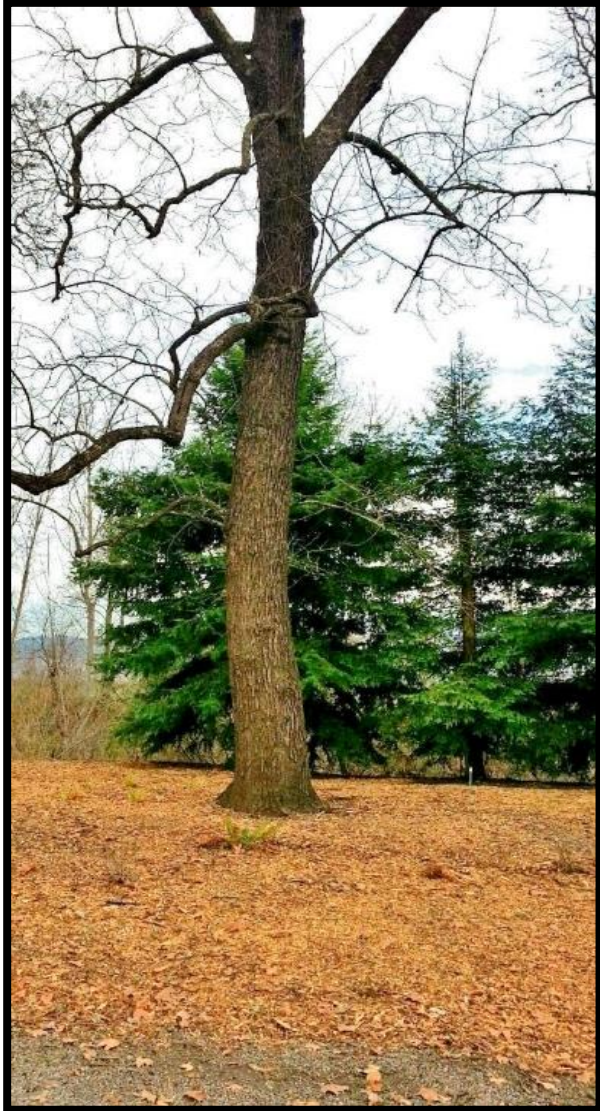
Northern California Black Walnut
Juglans hindsii

- Are genetically pure native *Juglans hindsii* rare?
- Does a refuge population of genetically pure native *Juglans hindsii* still exist in Contra Costa and Napa Counties?
- Do refuge populations of genetically pure native *Juglans hindsii* still exist in other historic core habitat areas?
- If yes, can self-sustaining native refuge populations be expanded?
- If no, can self-sustaining native refuge populations be restored?
- Are genetically pure *Juglans hindsii* more resilient to drought conditions than hybridized *Juglans hindsii*?

How Will We Find Out?

Northern California Black Walnut

Juglans hindsii



ASSESS

Conduct research to assess the current state of knowledge

INVENTORY

Collect inventories of known specimens in historic core habitats

EVALUATE CONTEXT

Study historical ecology to assess the likelihood of natural propagation and possible sources of hybridization

PLAN

Create field documentation and sampling methodologies

SAMPLE

Collect specimen samples

TEST GENETICS

Conduct genetic testing of the samples

PROPAGATE

Propagate genetically native specimens

PLANT

Plant native trees in restoration projects

MONITOR

Assess whether native trees have self-propagated in natural habitat

TEST AGAIN

Test offspring for genetic purity

SHARE THE STORY

Heritage Walnut Recovery Project

Proposed Phases

Northern California Black Walnut
Juglans hindsii



1. PILOT SAMPLING & PROPAGATION PROJECT

Research Propagation Methods that Maintain Genetic Purity; Propagate from verified DNA tested Native Trees on Swanson Vineyards; Plant seedlings in Napa River Restoration Project. Research State of Knowledge About Resource Status and Recovery; Compile Existing Inventories of known Specimens in Napa County; Collect Initial Specimen Samples for Genetic Testing

2. SAMPLE & TEST DNA OF TREES IN HISTORIC RANGE

Collect Specimen Samples for Genetic Testing from throughout Contra Costa and Napa Counties and from the three CNDDDB Verified Occurrences; Research Historical Ecology of Inventoried Specimens; Test Genetics of Samples

3. REGIONAL RESOURCE RECOVERY ASSESSMENT

Evaluate Resource Recovery Options Throughout Historic Range

4. HABITAT RESTORATION, EDUCATION & OUTREACH

Partner with organizations to propagate seedlings from identified heritage trees for planting in habitat restoration projects; conduct education and outreach programs

Native Northern California Black Walnut

Juglans hindsii

Heritage Walnut Conservation Project

Plant trees for posterity



*to pass these gifts on
undiminished to the next generation.*

*- The Roman Poet Caecilius Statius
(c. 220 BC - c. 166 BC)*