Building landscape resilience through climate connectivity

Mayacamas to Berryessa Connectivity Network (M2B)

Tosha Comendant, Lisa Micheli, Morgan Gray (Pepperwood)
Adina Merenlender (UC Berkeley)

Napa Watershed Symposium

May 16, 2019

Pepperwood is…

a leader in advancing the health of Northern California's land, water and wildlife

Key points

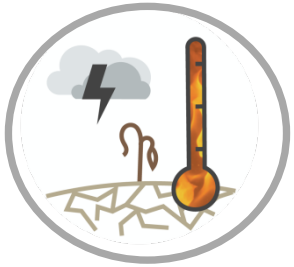
- Connected landscapes have multiple benefits
- Toolkit available to planners and practitioners
- Need to protect ***and*** manage habitat linkages

Benefits of connected landscapes

Clean and abundant water

Reduce wildfire risk

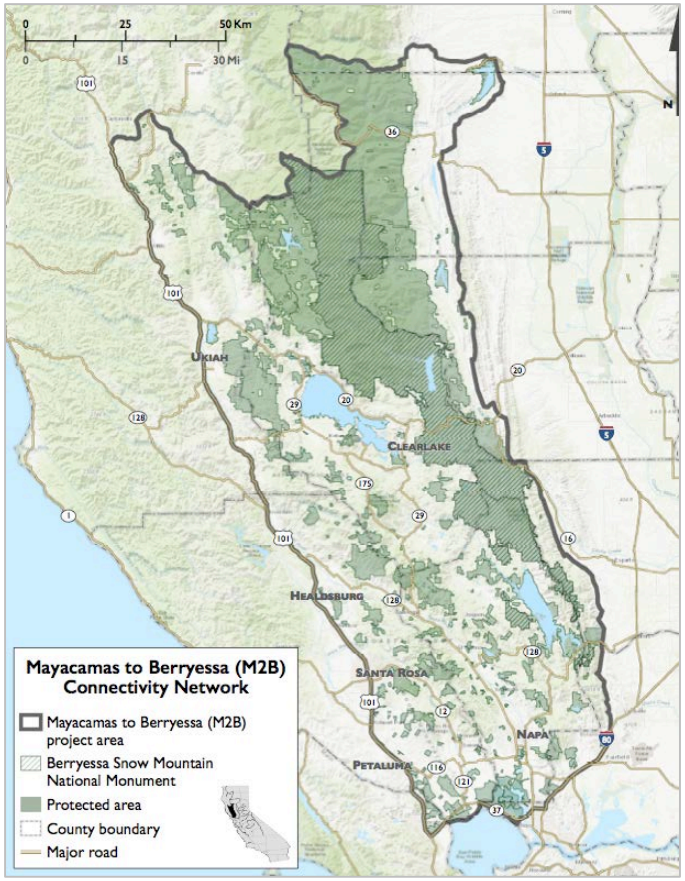
Room to roam



Climate change resilience

Pepperwood PRESERVE

Mayacamas to Berryessa Network (M2B)



Conservation and stewardship of habitat corridors

Integrating habitat mapping, threat assessment, and climate change projections to co-produce a multi-county habitat connectivity assessment

CA LCP

Pepperwood PRESERVE

Berkeley UNIVERSITY OF CALIFORNIA

acr conservation in action

AG + OPEN SPACE

SONOMA LAND TRUST

Land Trust OF NAPA COUNTY

M2B regional project

What we did:

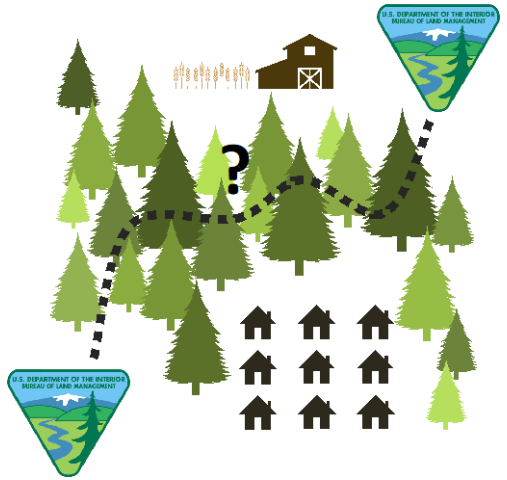
- Facilitated regional collaboration to assess ***potential*** linkages
- Quantified ***climate benefits*** of potential linkages
- Facilitated identification of ***habitat corridor*** projects

What we did *not* do:

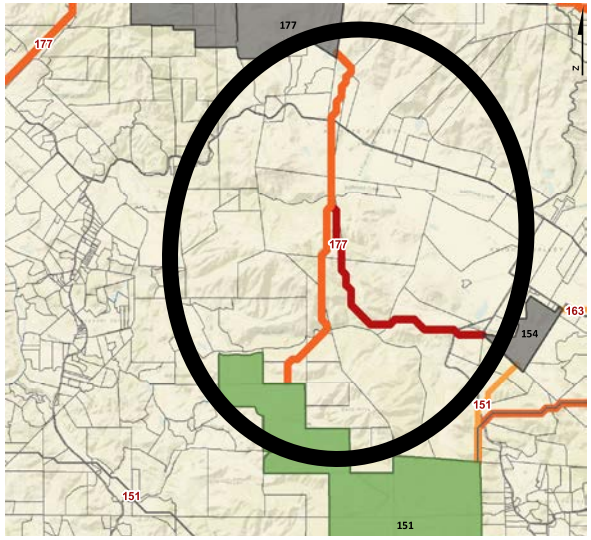
- Generate corridor map for the region
- Create corridors based on species models
- Rank potential linkages
- Tell practitioners to adopt management objectives

M2B focal questions

What connectivity exists between protected areas?

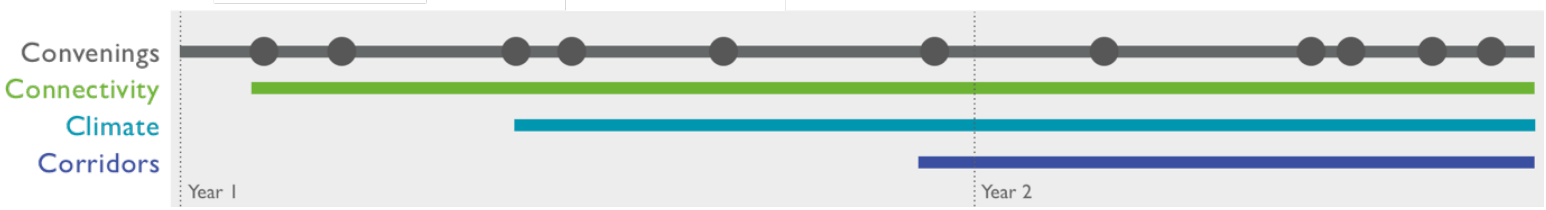


Which linkages offer long-term climate connectivity?



M2B Network activities

Successful connectivity efforts require building social ***and*** physical landscape linkage networks



Pepperwood PRESERVE

Connectivity: landscape permeability

Estimate of how easily animals and resources might move through the landscape

Pepperwood PRESERVE

Connectivity between protected areas

Modeled both **terrestrial** *and* **riparian** potential linkages

Pepperwood PRESERVE

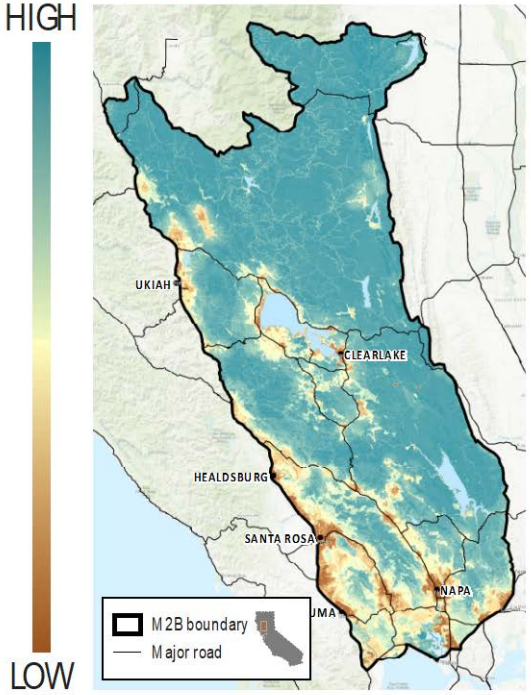
Connectivity: terrestrial linkage potential

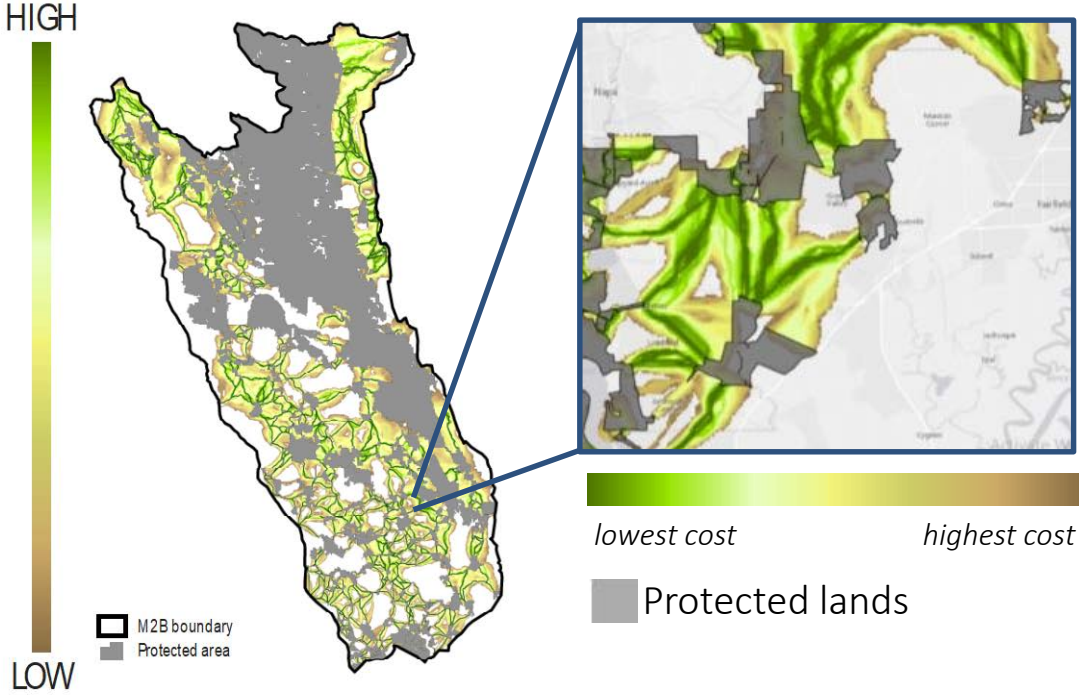
ecological integrity

PERMEABILITY SURFACE

protected lands

linkage potential



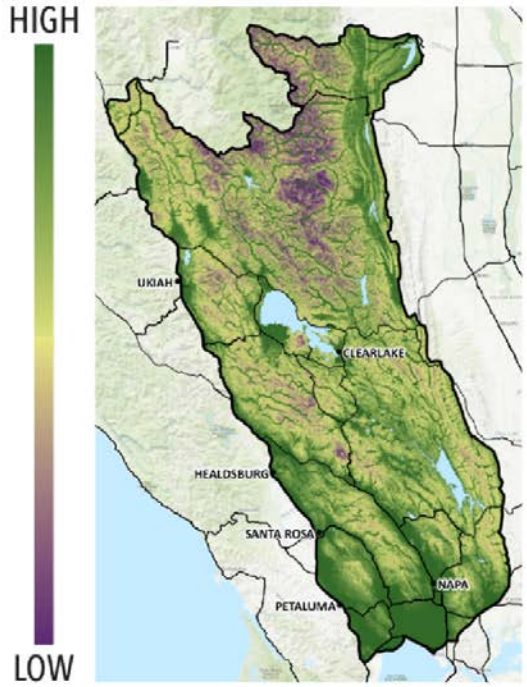


Pepperwood PRESERVE

Connectivity: riparian linkage potential

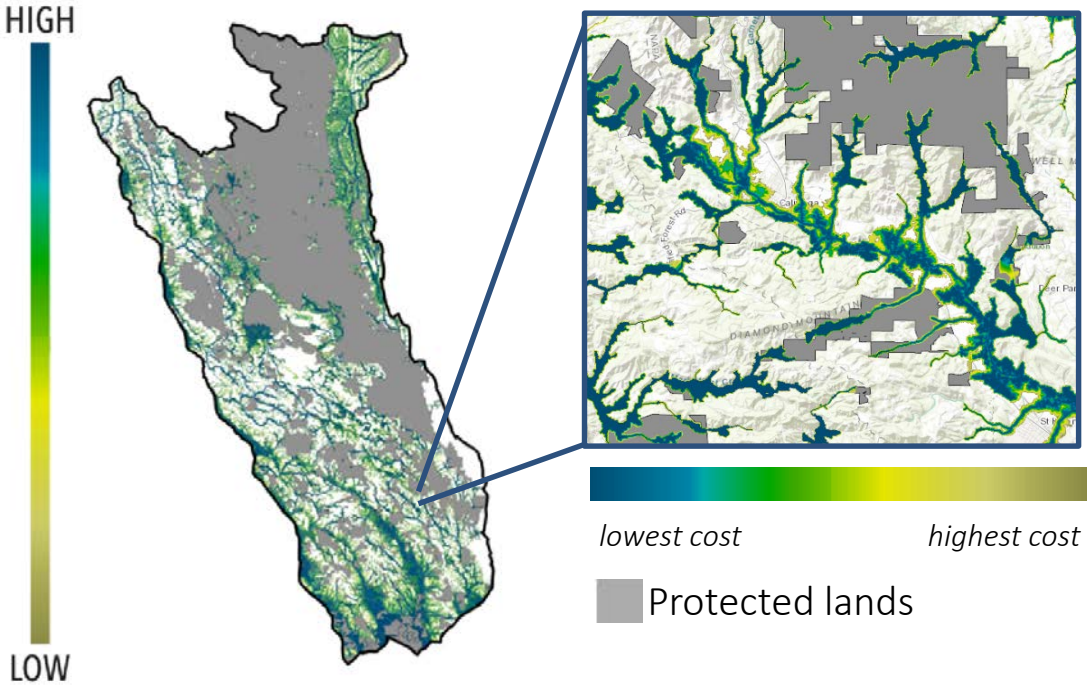
riparian features

PERMEABILITY SURFACE



protected lands

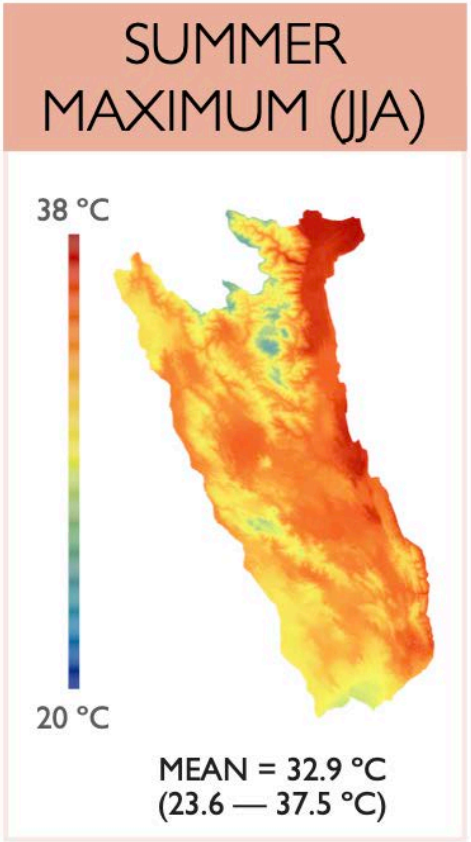
linkage potential

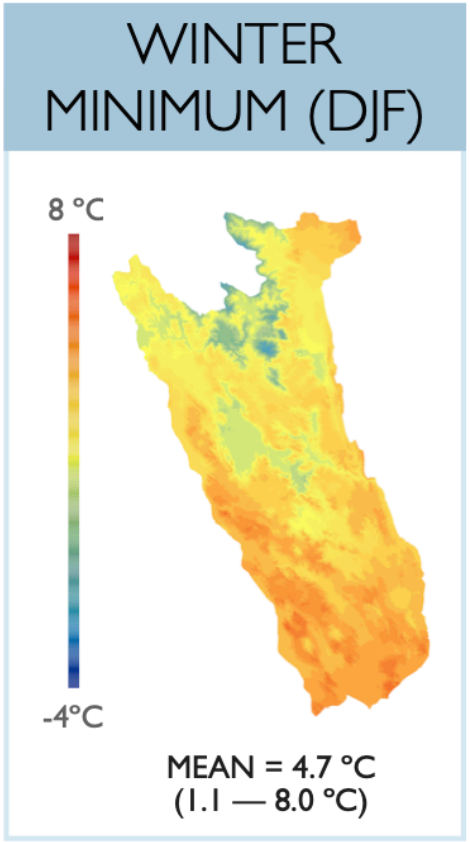


Pepperwood PRESERVE

Climate: seasonal analysis

Mid-century temperature forecast (2040 – 2069)

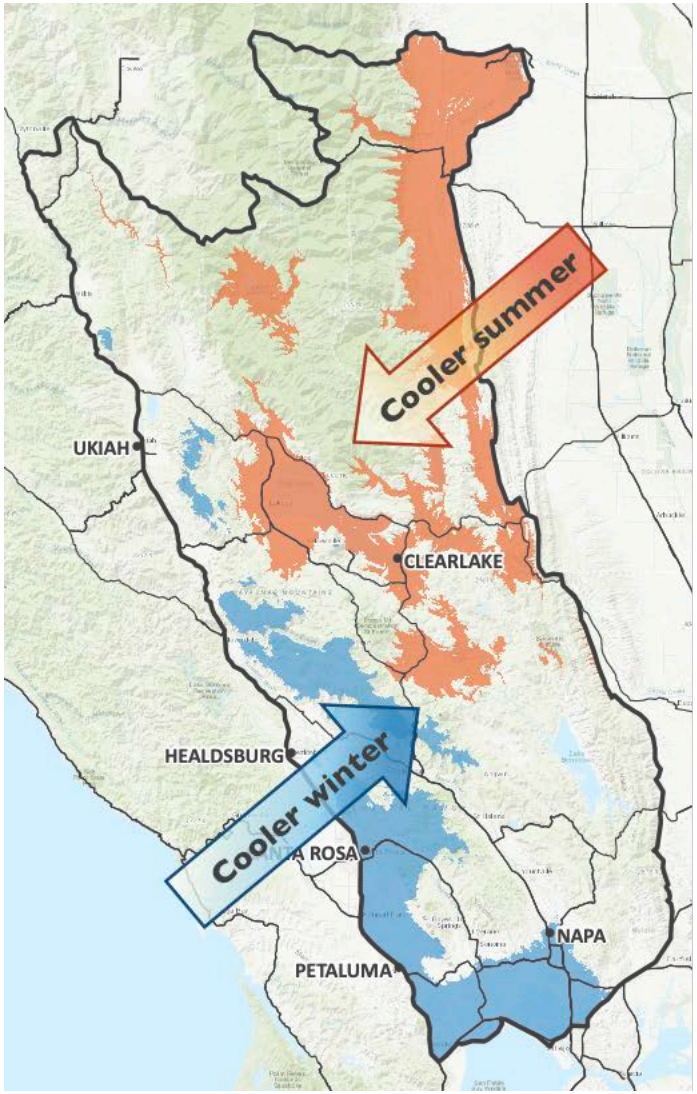




FLINT & FLINT 2012; PIERCE ET AL. 2015

Pepperwood PRESERVE

Climate gradients run from coast to valley



Zones of "novel" high temperatures projected for 2050

SUMMER

- Unprecedented warming
- Direction to cooler climates
  South & coastward

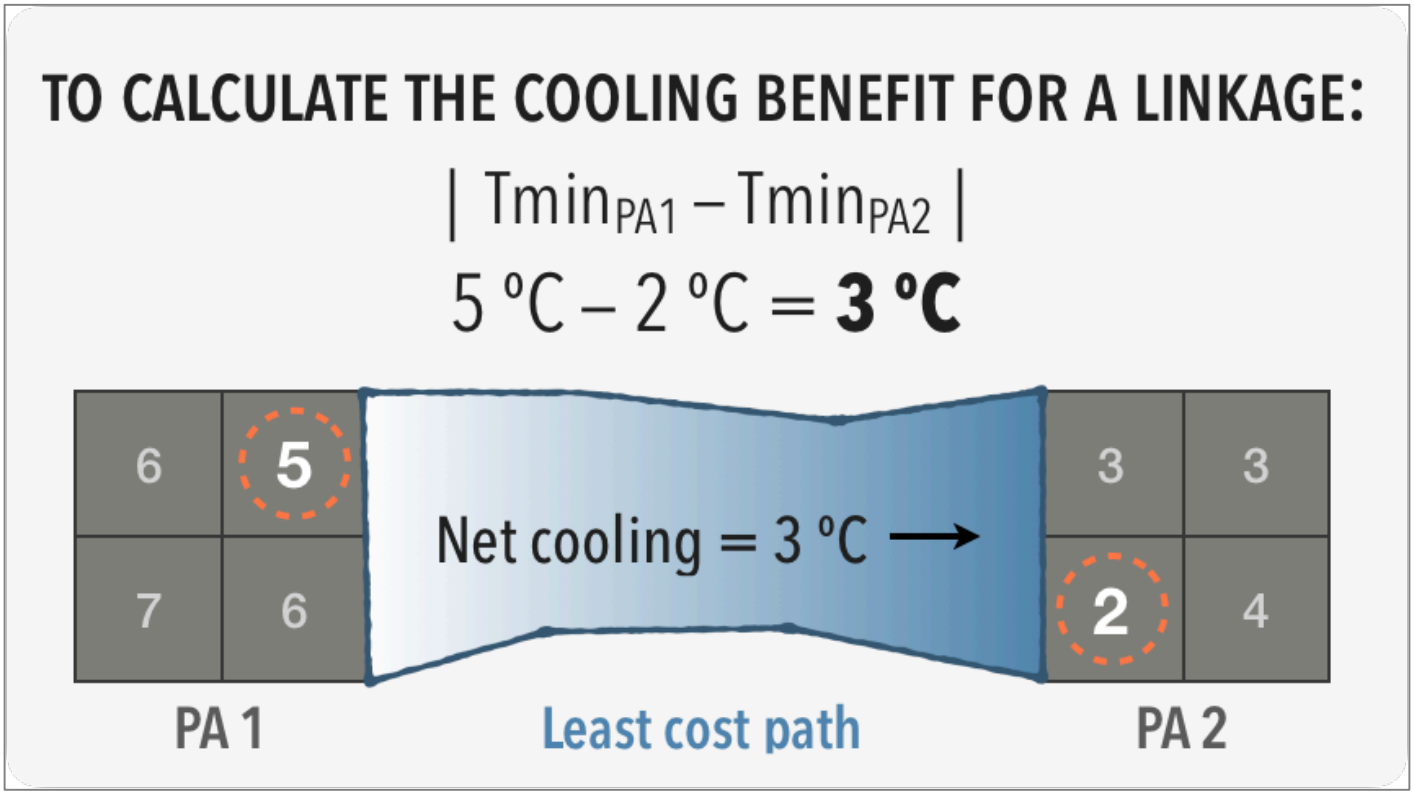
WINTER

- Unprecedented warming
- Direction to cooler climates
  East & up elevation

- Mayacamas to Berryessa (M2B) boundary

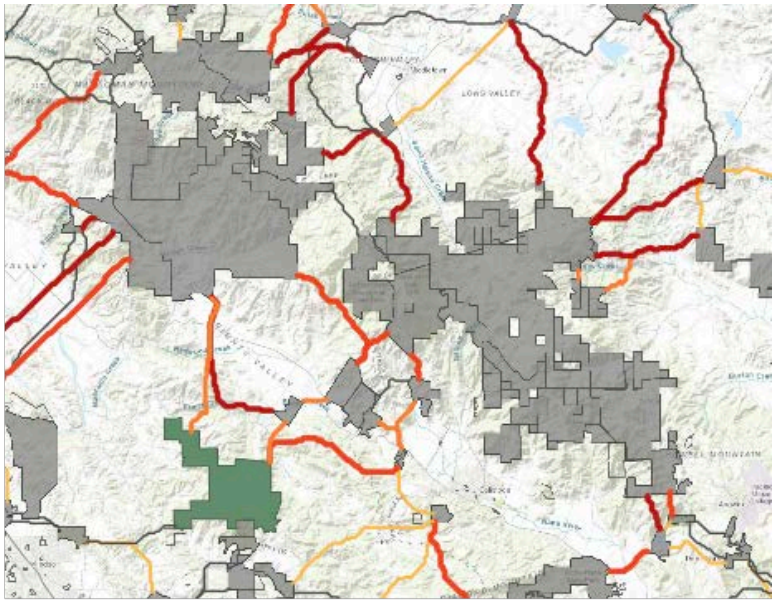
Pepperwood PRESERVE

Climate: cooling benefits of linkages



Climate: linkage-specific cooling benefits

mean summer maximum temperature



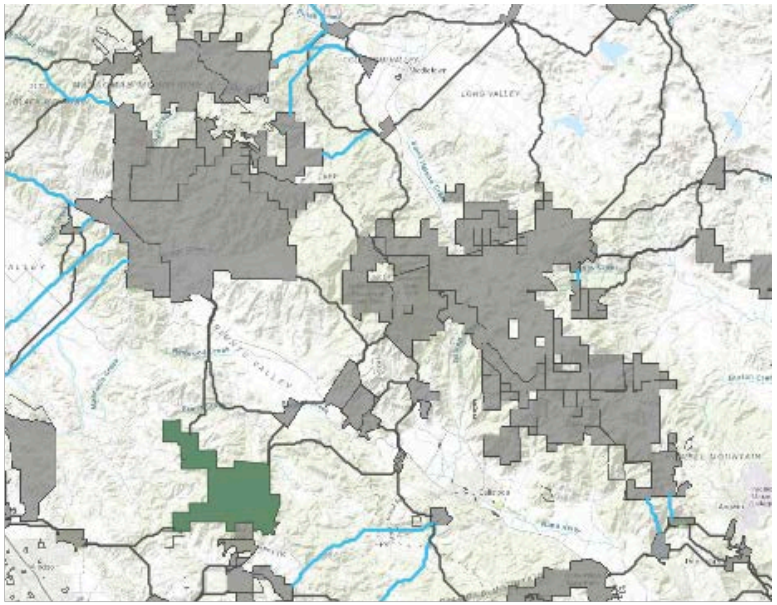
Cooling Effect

< 1 °C	1 - 2 °C	2 - 3 °C	3 - 4 °C	> 4 °C

Protected lands

Pepperwood

mean winter minimum temperature

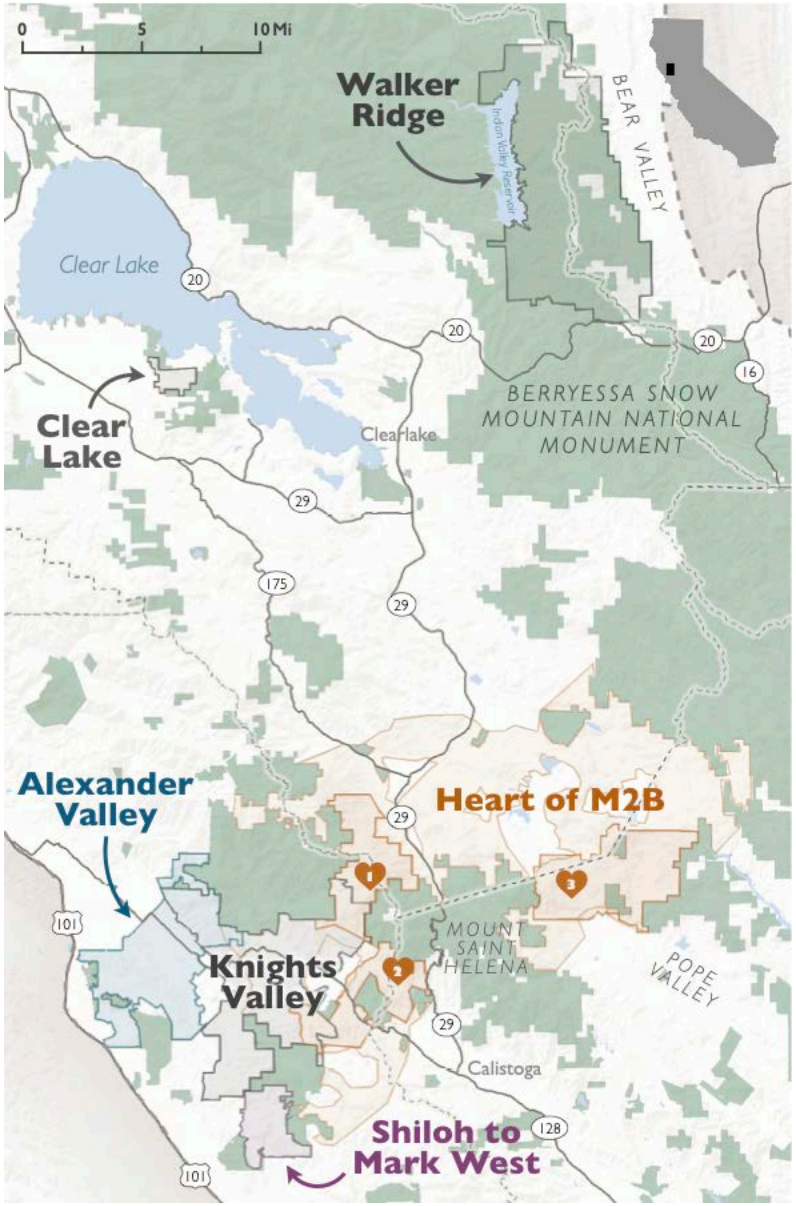


Cooling Effect

< 1 °C	1 - 2 °C	2 - 3 °C	3 - 4 °C	> 4 °C

Pepperwood PRESERVE

Corridors: parcel scale evaluations



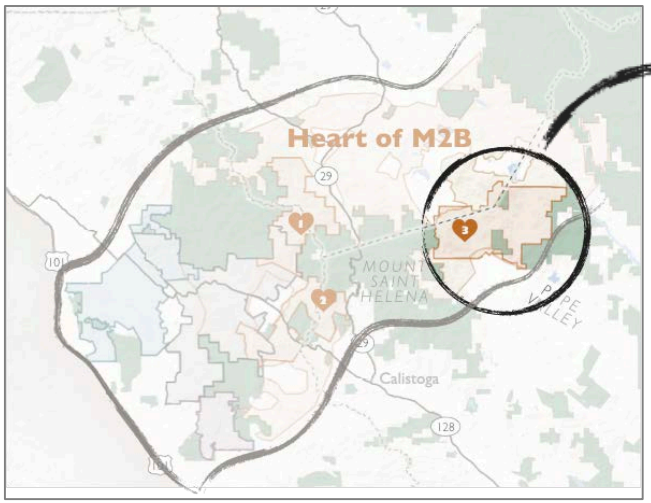
We conducted more detailed analysis for corridor evaluations and project planning

Pepperwood PRESERVE

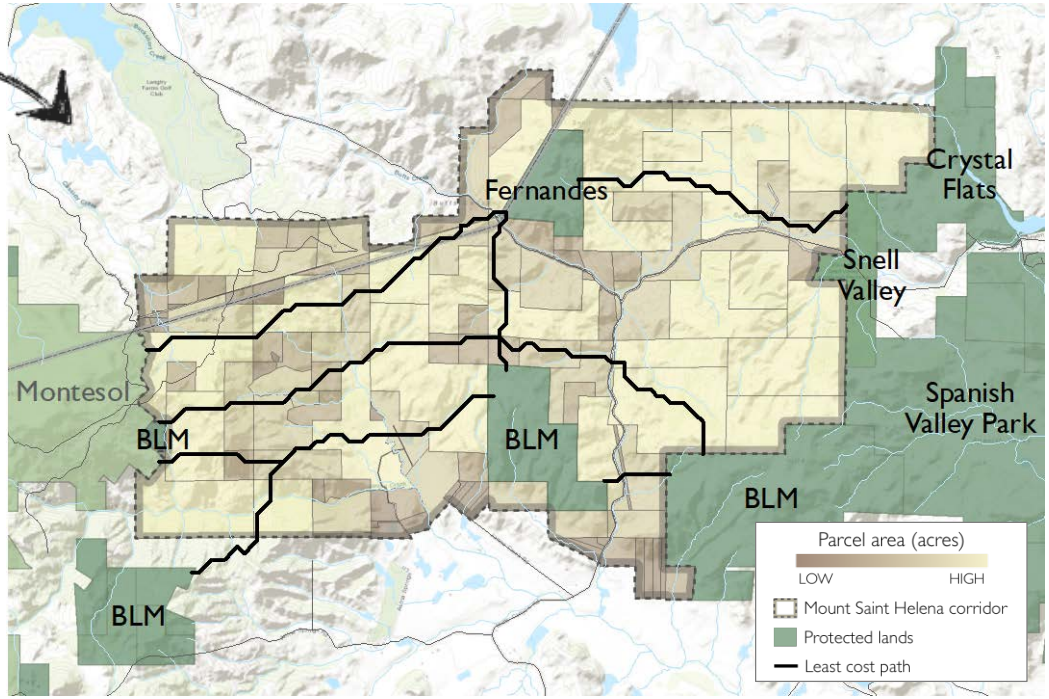
Corridors: parcel scale evaluations

Example: Mount St. Helena M2B Corridor

Identify area of interest



Delimit corridor using parcel boundaries ***and stakeholder input***



Pepperwood PRESERVE

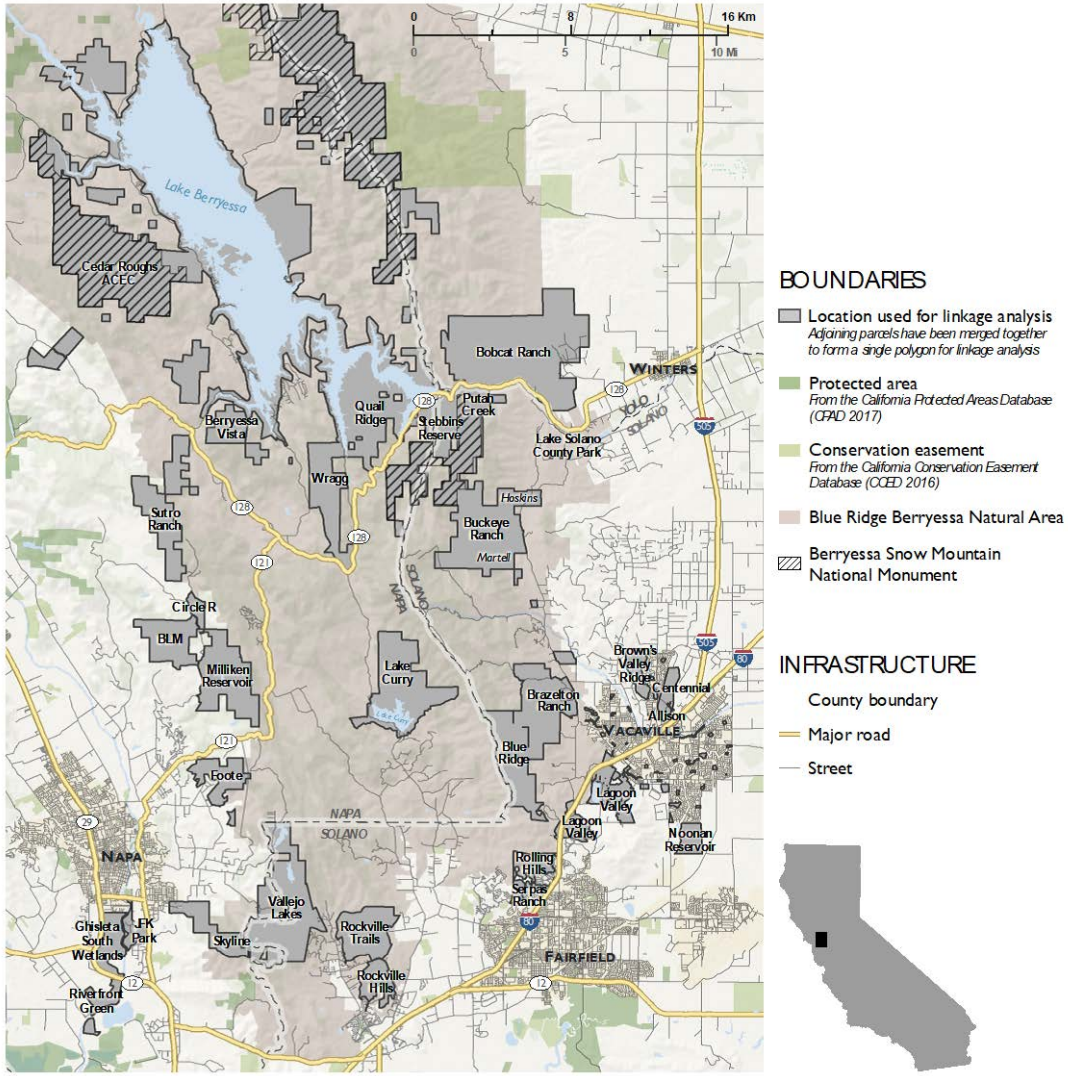
Corridors: parcel scale evaluations

Blue Ridge - Berryessa Partnership

SOLANO LAND TRUST

Land Trust OF NAPA COUNTY

- Identify potential linkages
- Quantify climate benefit
- Compare key connectivity and climate results



Pepperwood PRESERVE

Toolkit: data, tools, & reports

Data Basin

databasin.org

FREE WEBINAR!

JUNE 20

BIOS

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

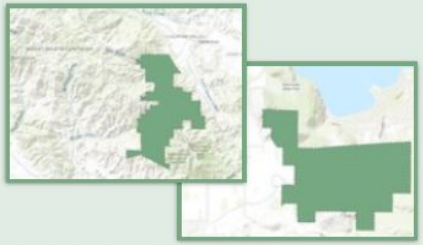
wildlife.ca.gov

Pepperwood PRESERVE

Toolkit: data, tools, & reports

FOCAL CORRIDORS

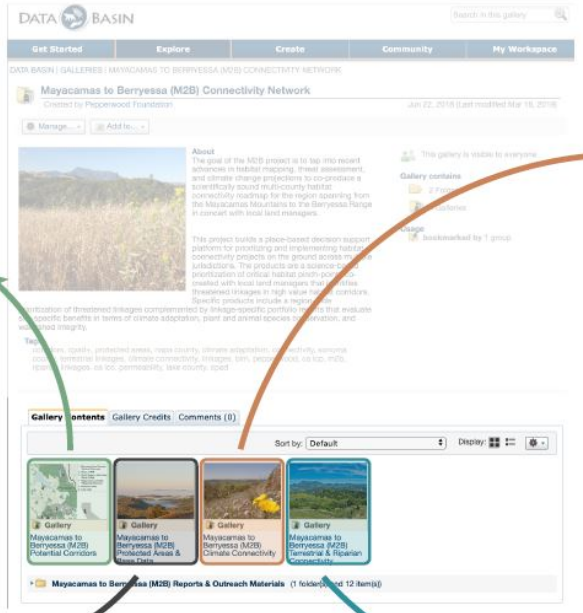
Heart of M2B (3)
Pepperwood to Modini
National Monument
Clear Lake
Shiloh to Mark West
Alexander Valley



CLIMATE DATA

Summer and winter data for:

Recent temperature
Mid-century temperature
Climate benefit
Shrinking climate space



BASE DATA

CPAD+
Parcels
M2B boundary
CPAD (2016)
CCED (2016)
Natural patches

CONNECTIVITY DATA

Permeability
Potential linkages
Least cost paths

Pepperwood PRESERVE

Toolkit: outreach brochures

Pepperwood PRESERVE

Mayacamas to Berryessa Landscape Connectivity Network

WHY WILDLIFE CORRIDORS?

How connected landscapes benefit our community and what you can do to help

Motion-activated wildlife cameras are a fun, non-invasive way to learn who is visiting your property!

DID YOU KNOW?

The two-million-acre landscape spanning the Mayacamas to Berryessa mountain ranges of Northern California is one of the most biologically diverse areas in the world!

7 WAYS YOU CAN KEEP YOUR LANDS WILDLIFE FRIENDLY

1 Keep pets indoors or contained

Cats and dogs are natural predators and can devastate wildlife populations. Keep pets leashed or fenced when they're outside.

2 Dim lights at night

Artificial light at night disrupts ecosystems. Timers and motion sensors on outdoor lights prevent confusion of wildlife—and save energy.

3 Secure livestock

Provide security in the form of paddocks and guardian animals to help minimize livestock and wildlife conflicts.

4 Stash your food and trash

Avoid attracting wildlife to your property by securing trash containers and keeping animal food indoors.

5 Road safety for people & wildlife

To reduce collisions, honk and flash high beams at animals on the road. Consider wildlife crossing strategies at roadkill hotspots.

6 Friendly fencing

Remove unused fencing, and make sure your fences are highly visible with space at the bottom to let wildlife pass through.

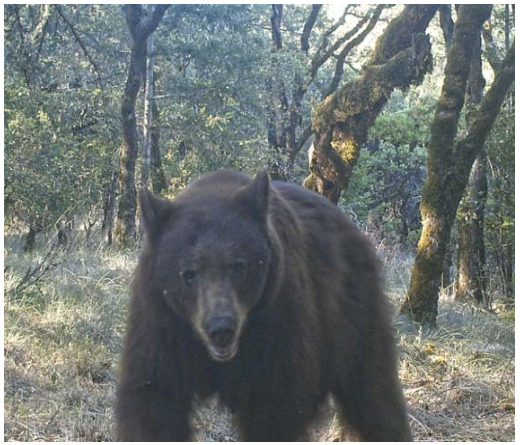
7 Reduce wildfire risk

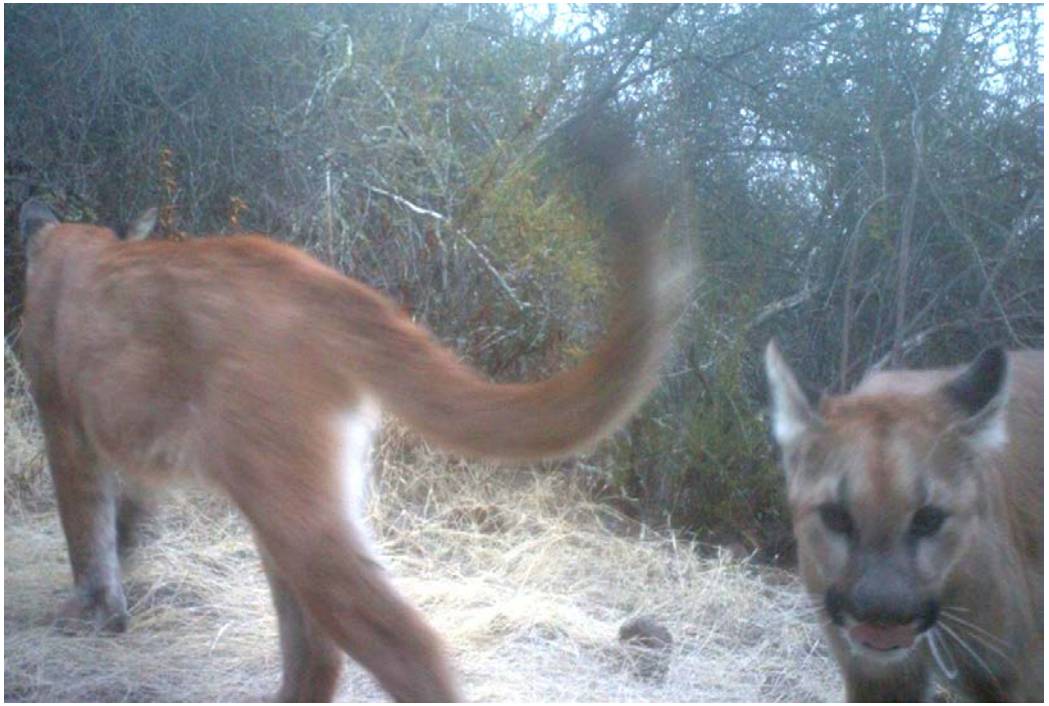
Maintain fire- and drought-tolerant native plants in forests and landscaping, and reduce potential wildfire fuels on your property.

Key points

- Connected landscapes have multiple benefits
- Toolkit available to planners and practitioners
- Need to protect ***and*** manage habitat corridors

Expanding wildlife cameras





Adaptive management of habitat corridors

A resilient forest is fire adapted

PRESCRIBED FIRE

- Burns fuel build-up
- Mature trees survive
- Nutrients enrich soil

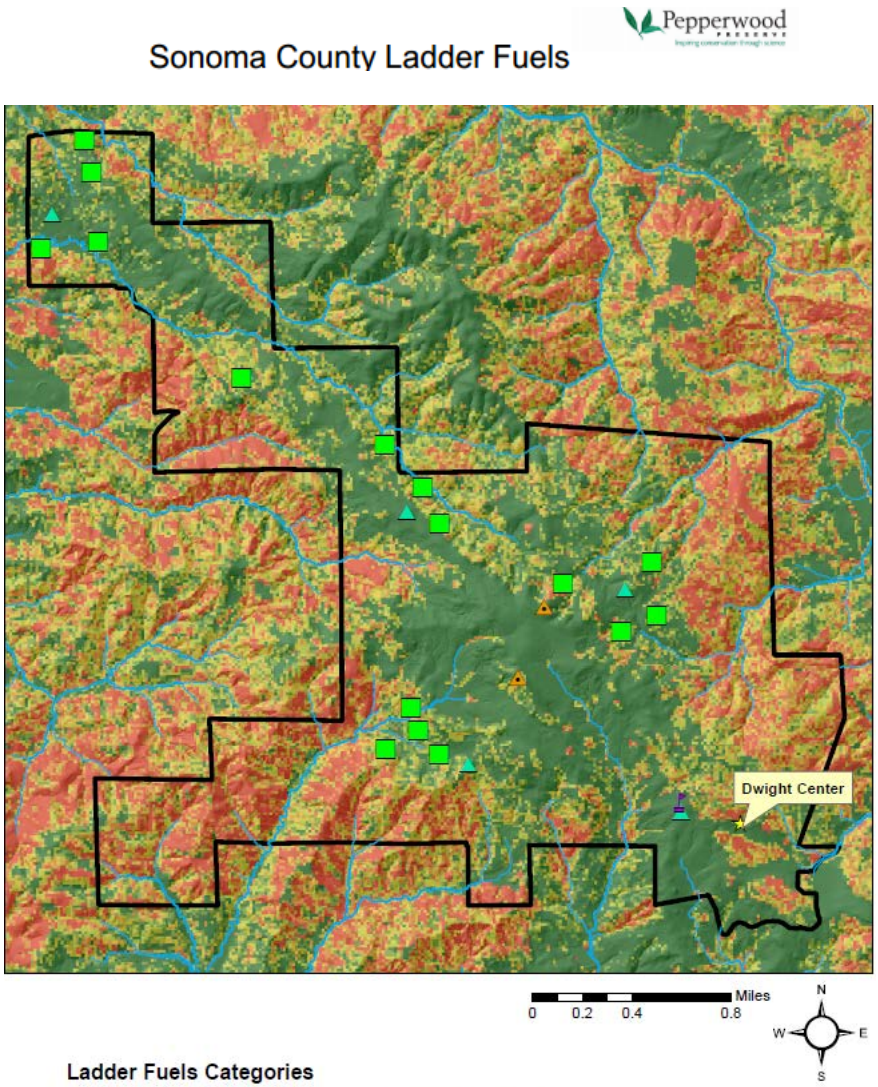
NEW GROWTH

- Openings promote growth
- Forest diversity increases
- Fire followers sprout
- Supports plants & animals

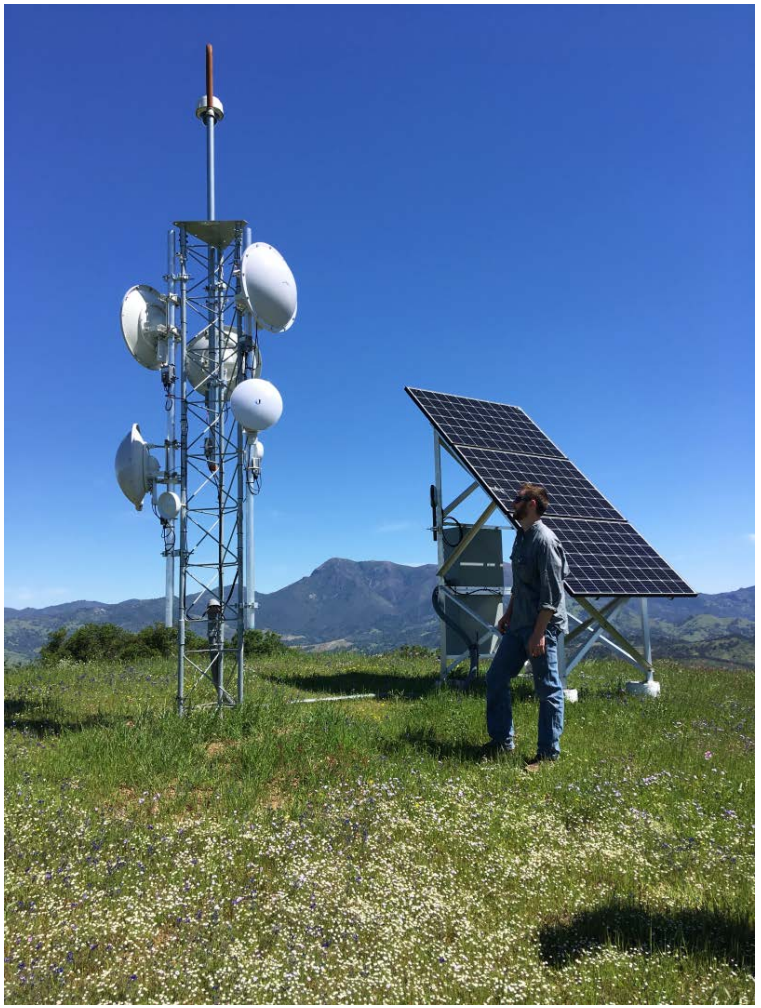
RESILIENT HOMES

- Reduced firestorm risk
- Defensible space buffers buildings
- Emergency access maintained
- Fire action plans save lives

Improving fuels maps & fire detection



ALERT Wildfire



Contact us at Pepperwood!

Tosha Comendant — *Conservation Science Manager*
tcomendant@pepperwoodpreserve.org

Lisa Micheli — *President & CEO*
lmicheli@pepperwoodpreserve.org