



Climate-wise Connectivity for Resilient Landscapes

Adina Merenlender

University of California, Berkeley
Hopland Research & Extension Center

Morgan Gray, Pepperwood Preserve

TODAY

1. Why habitat connectivity and what is climate-wise connectivity?
 1. Case in point: Mayacamas to Berryessa
2. A few key steps for implementation.

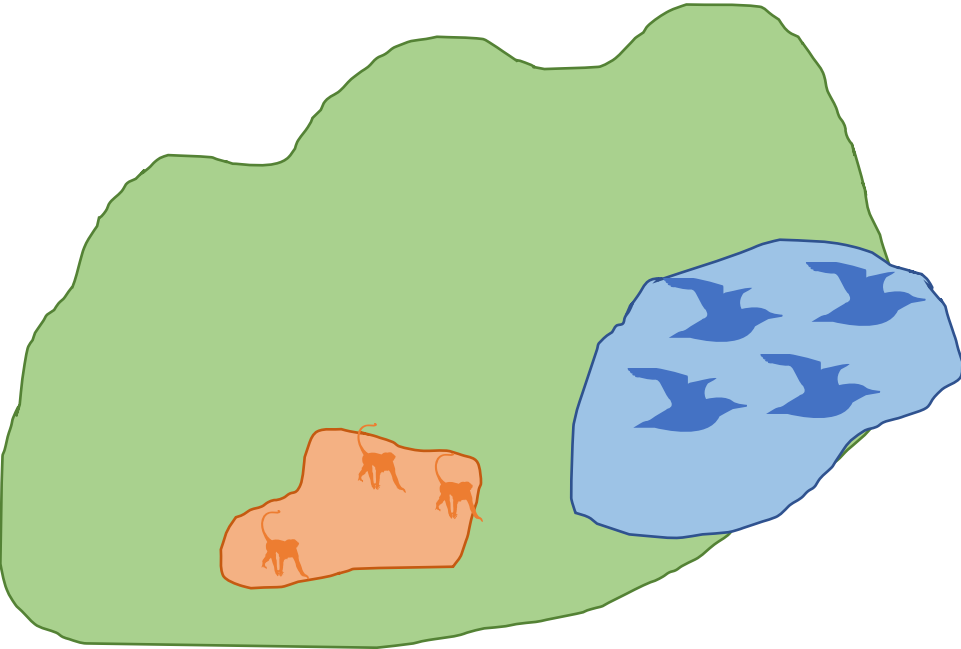


Addressing habitat loss and fragmentation

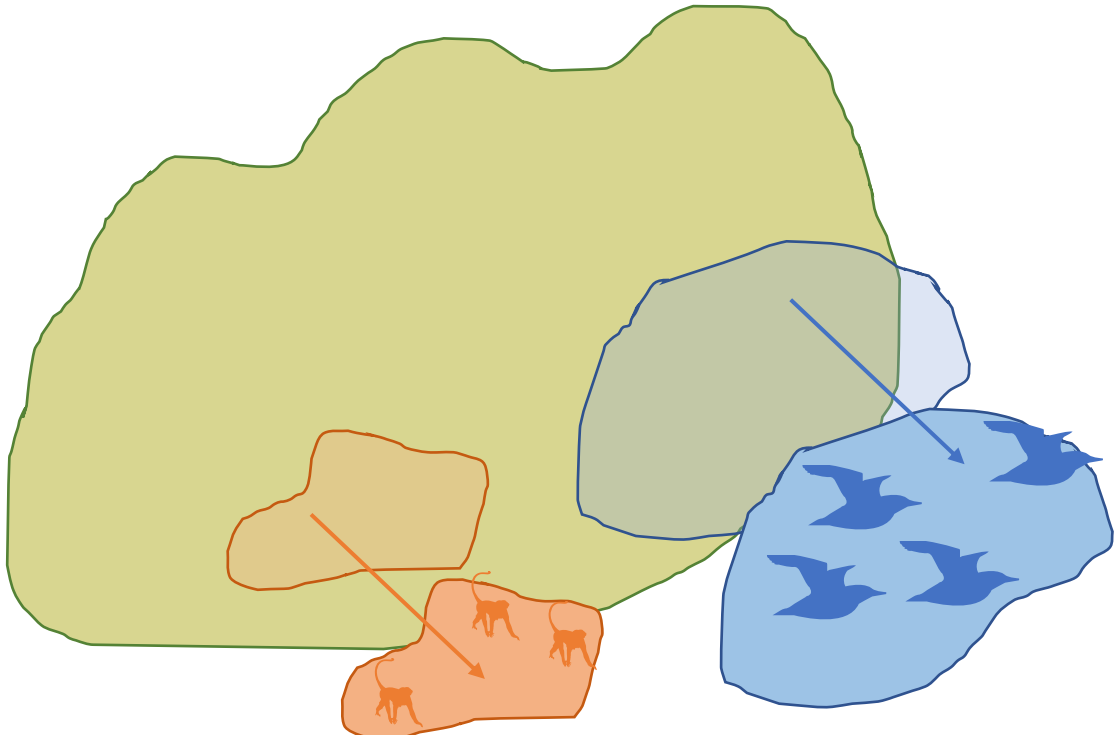


Suitable climate space may shift out of existing protected areas


Current





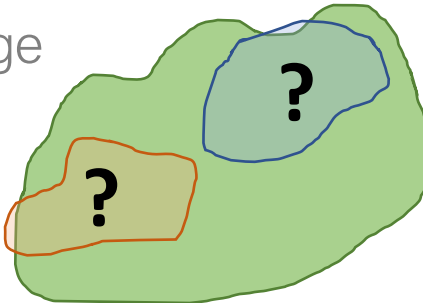
Future



Direction of climate change

 Protected area

  Species climate envelope or suitable 'climate space'



Connectivity

Ways

corridors

landscape linkages

permeable
landscapes

What for

daily
movements

gene flow

seasonal
migrations

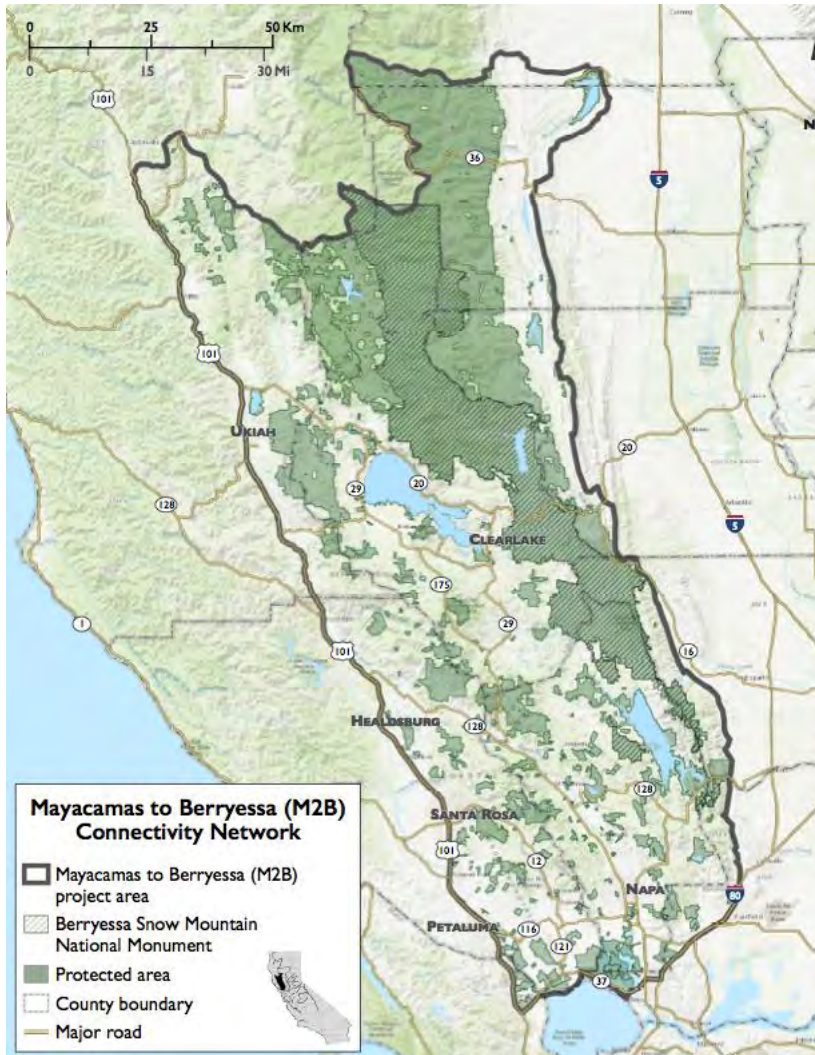
facilitate
range
shifts

Goals

increased
population viability

climate resilience

Mayacamas to Berryessa Coast Ranges, California: Building habitat connectivity for climate adaptation



Goal: Co-create climate-wise corridors with land managers.

1. Stakeholder engagement
2. Modeling approaches
3. Implementation at the parcel scale

Landscape permeability

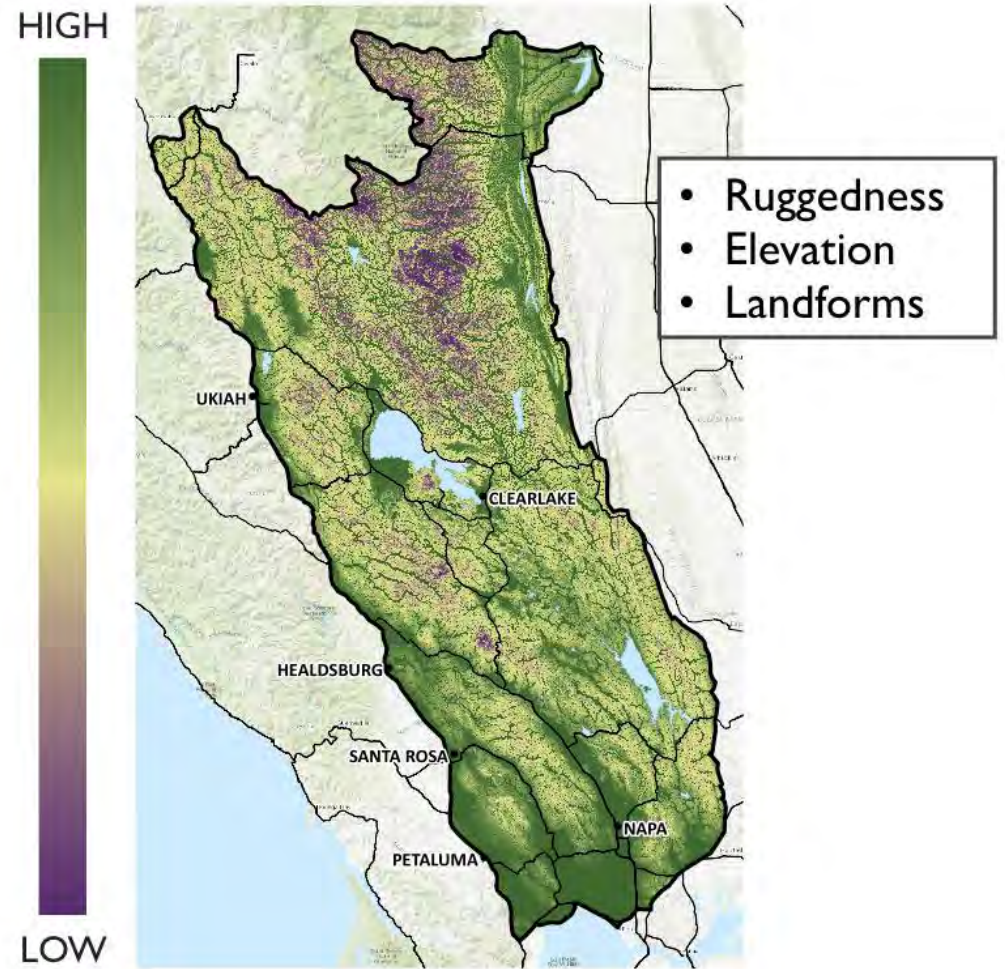
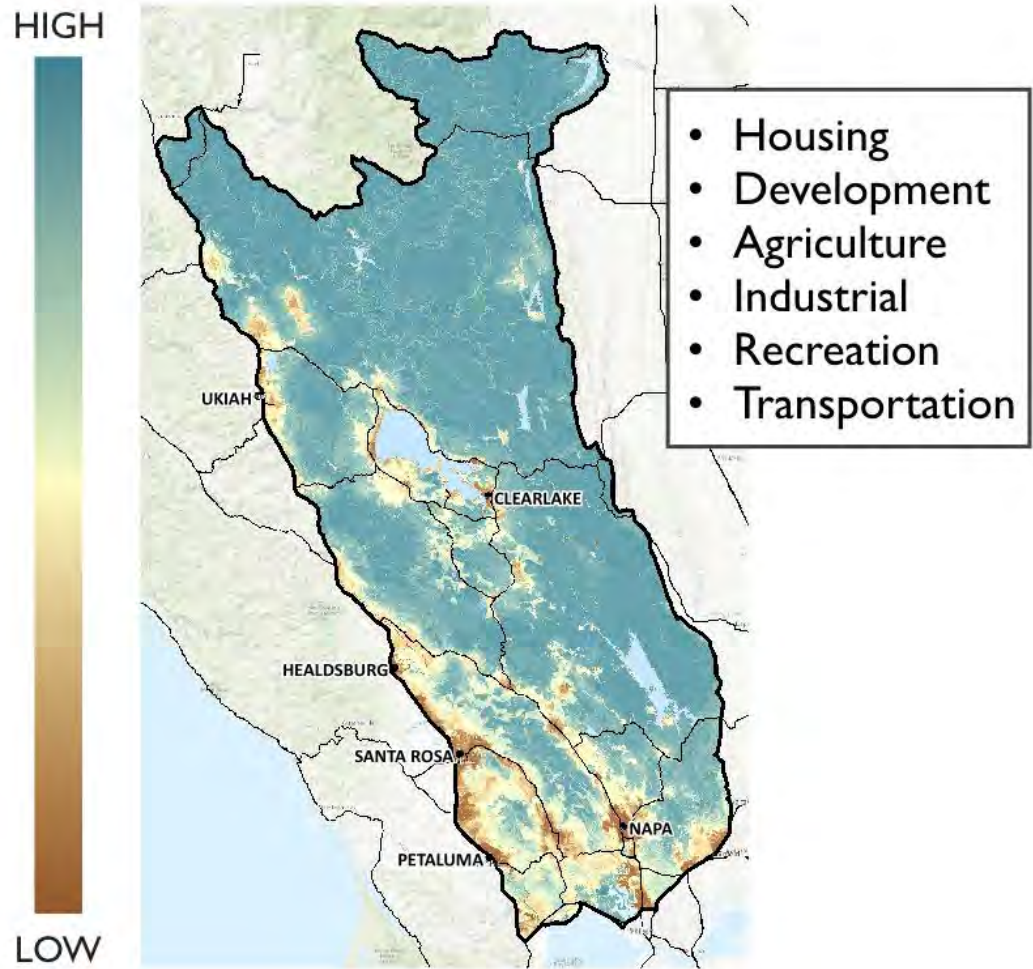
High permeability



Low permeability



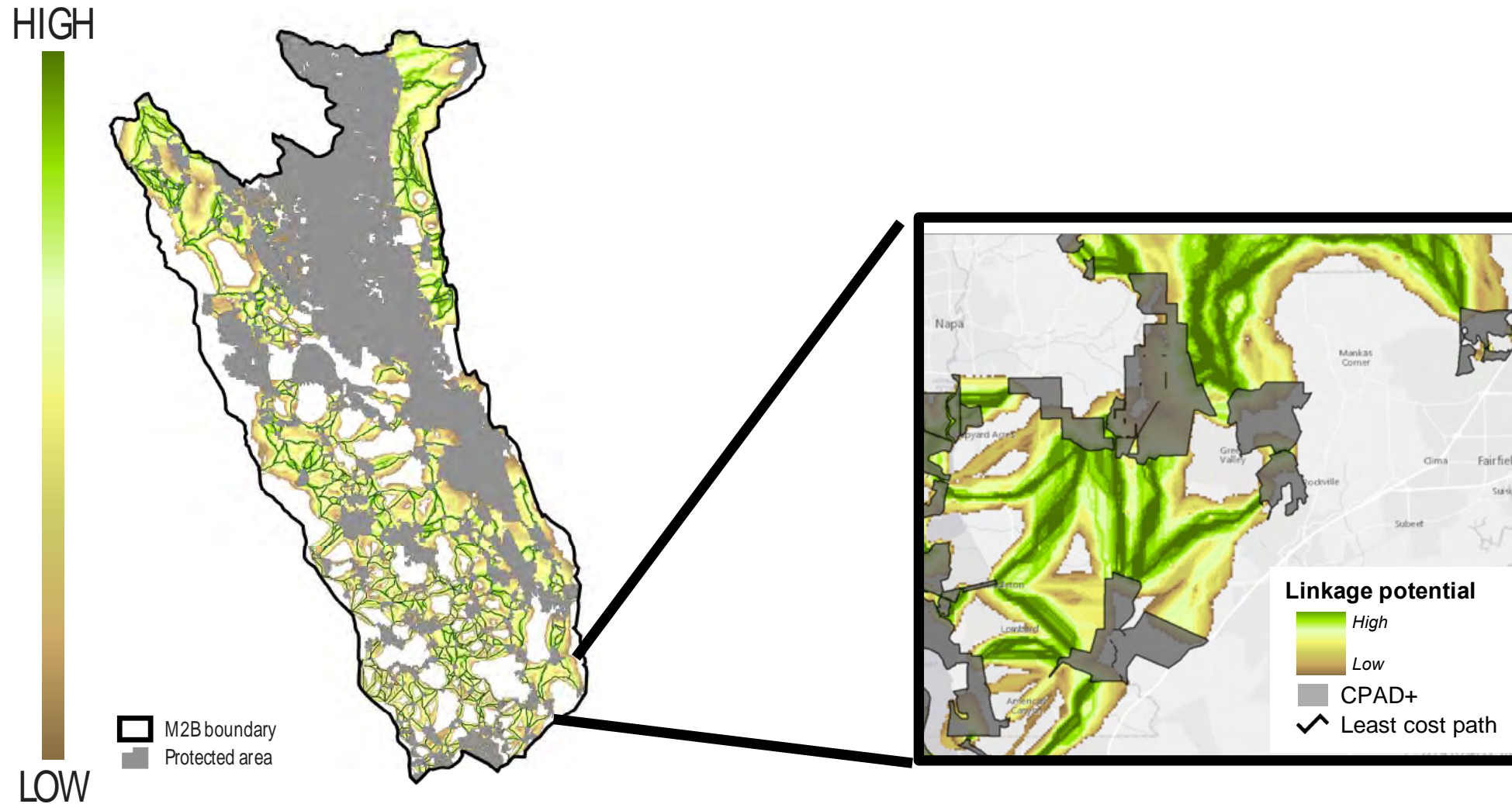
Permeability estimates (inverse of movement “cost” surface)



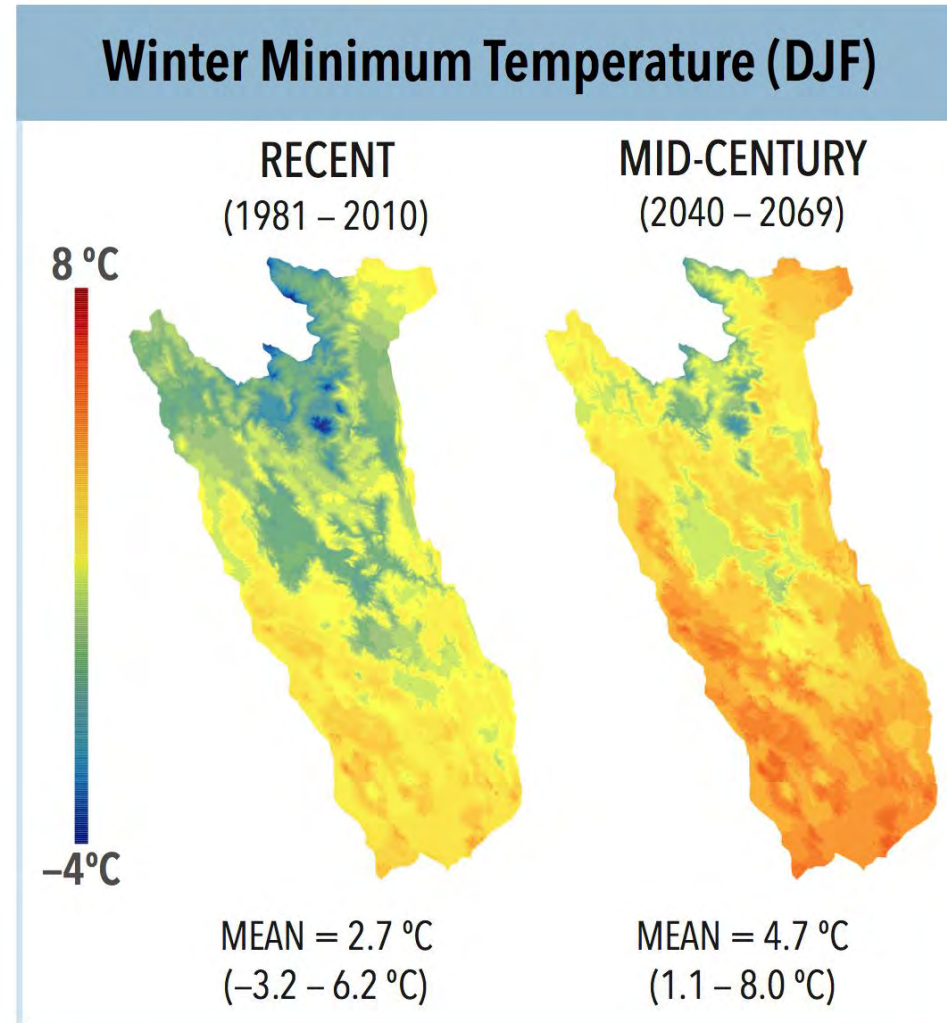
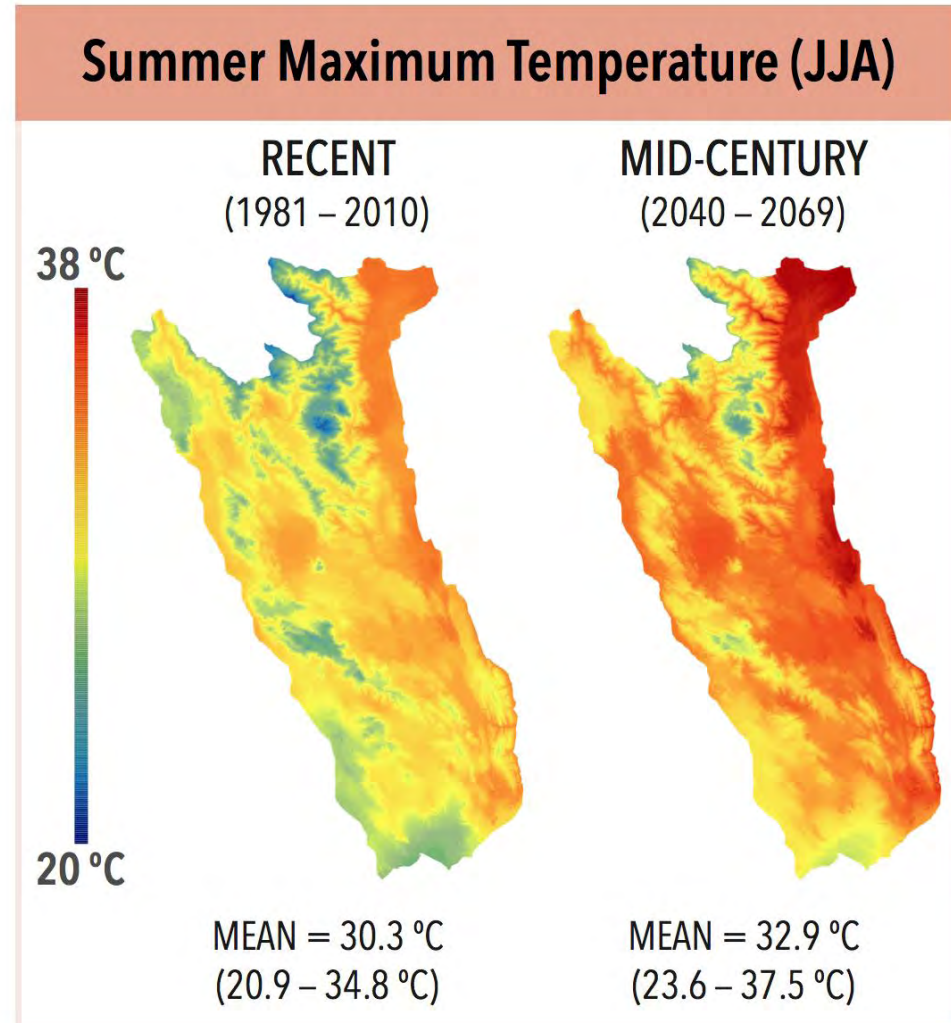
Terrestrial land cover - vegetation and the built environment
(terrestrial structural connectivity)

Stream course (riparian connectivity)

Potential linkages using least cost path through most permeable terrestrial and riparian landscape.



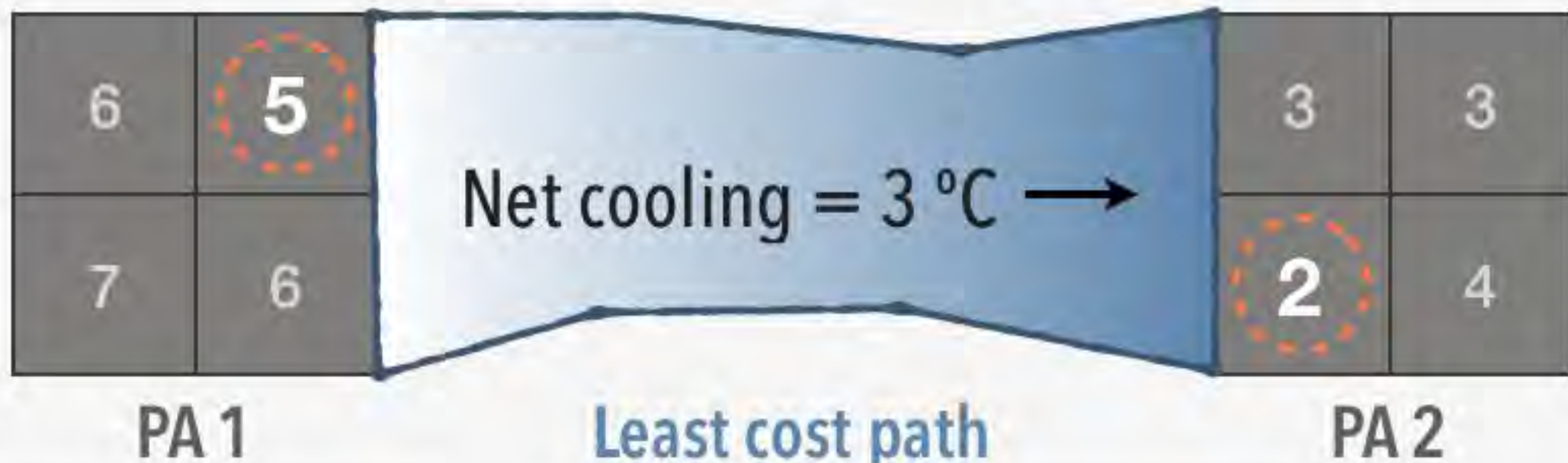
30m downscaled data for CNRM-CM5 with a focus on summer maximum and winter minimums.



TO CALCULATE THE COOLING BENEFIT FOR A LINKAGE:

$$| T_{\min_{PA1}} - T_{\min_{PA2}} |$$

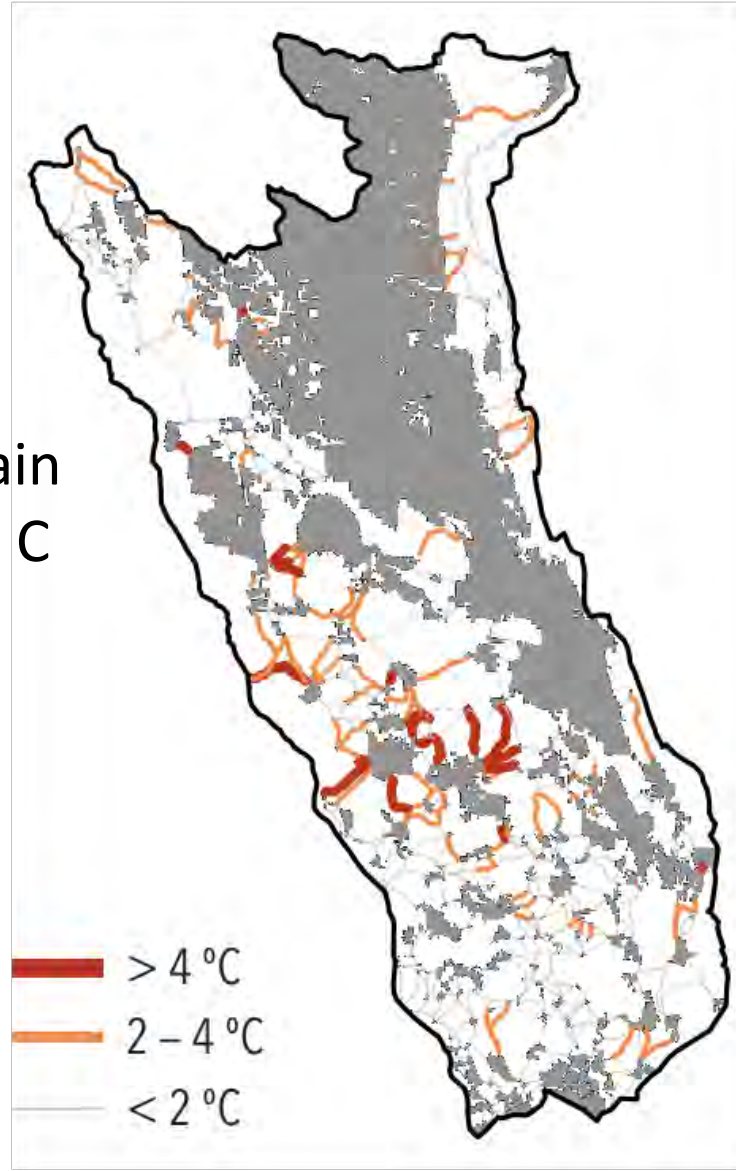
$$5^{\circ}\text{C} - 2^{\circ}\text{C} = \mathbf{3^{\circ}\text{C}}$$



Cooling climate benefit between connected protected areas.

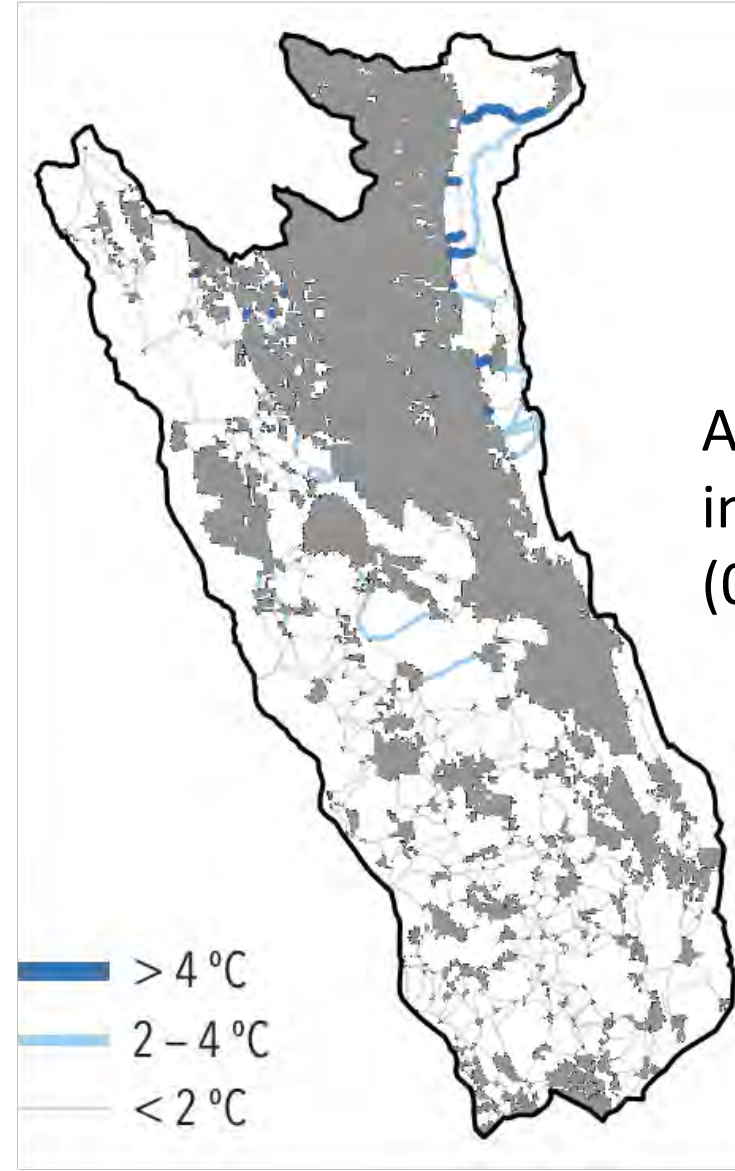
Summer cooling (JJA)

Average net gain
in summer 1.8 C
(0 - 13.5C)

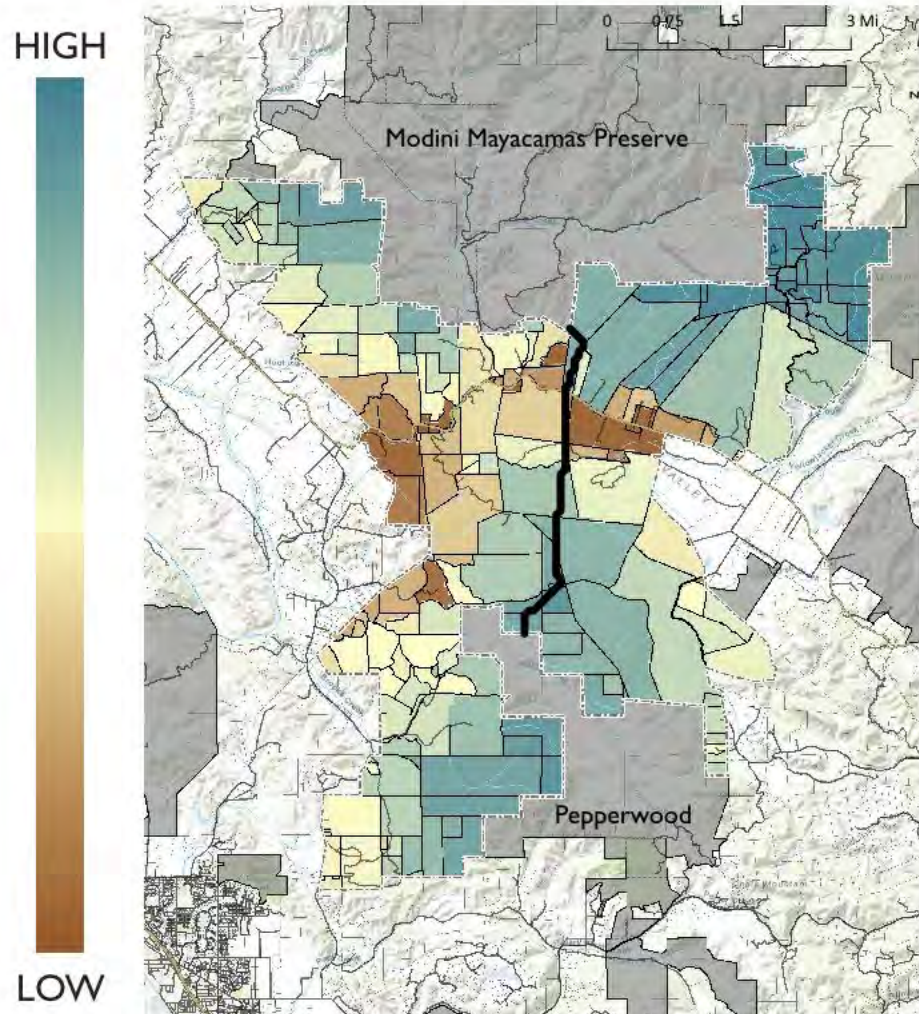


Winter cooling (DJF)

Average net gain
in winter 0.8 C
(0 - 6.8 C)



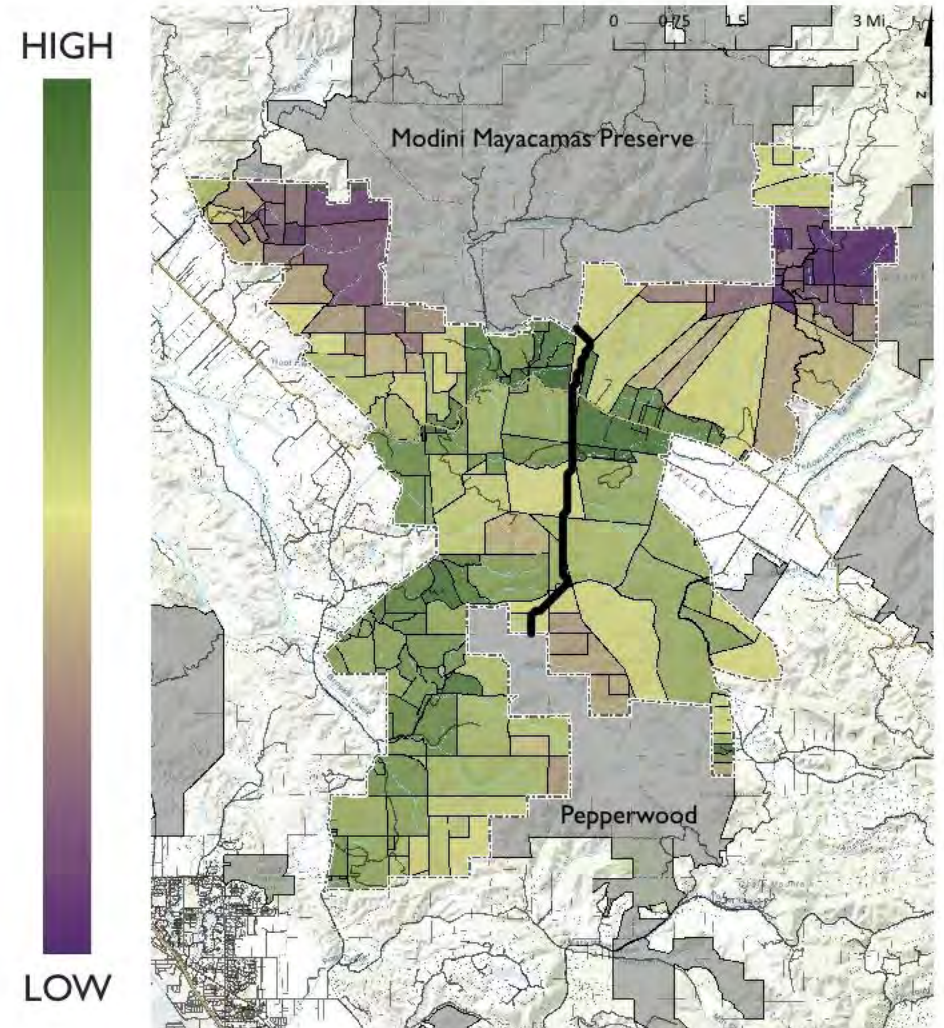
Terrestrial Permeability



Terrestrial Permeability



Riparian Permeability



Riparian Permeability



Wildlife corridors keep our landscape healthy

A **wildlife corridor** is a continuous swath of natural & agricultural lands.

These corridors are critical to maintain the quality of our water, forests, and wildlife in a rapidly changing environment.

BENEFITS OF CORRIDORS



Clean and abundant water

Connected creek corridors protect our streams and groundwater.



Reduced wildfire risk

Well-managed forests have less fuel to carry and spread flames.



Climate change resilience

Plants and animals can move through corridors to cooler places.



Room to roam

Connected landscapes maintain healthy flows of plants, animals, and resources.

We can work together to save and restore natural connections across our landscape. Protecting wildlife today keeps nature thriving and ensures future generations can enjoy the iconic natural beauty of this place we call home.

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.



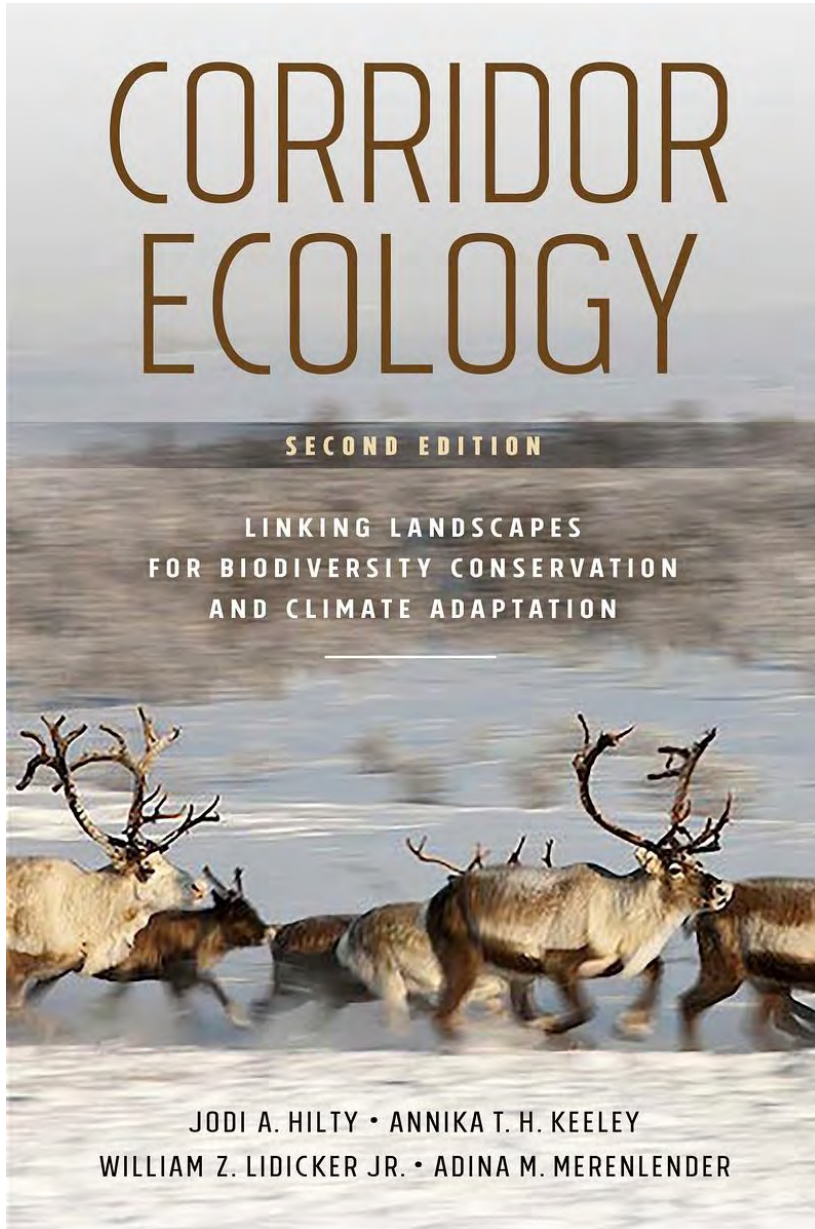
Motion-activated wildlife cameras

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!



Chapter 1. Habitat Loss, Fragmentation, and Climate Change

Chapter 2. The Ecological Framework

Chapter 3. Understanding Fragmentation

Chapter 4. Approaches to Achieving Habitat Connectivity

Chapter 5. Corridor Design Objectives

Chapter 6. Potential Pitfalls or Disadvantages of Linking Landscapes

Chapter 7. Identifying, Prioritizing, and Assessing Habitat Connectivity

Chapter 8. Climate-Wise Connectivity

Chapter 9. Ecological Connectivity in the Ocean

Chapter 10. Protecting and Restoring Corridors

Conclusion