

# Plant Communities and Corridors

Plants in Nature and Plants in Gardens



What  
are  
native  
plants?



What  
are  
endemic  
plants?



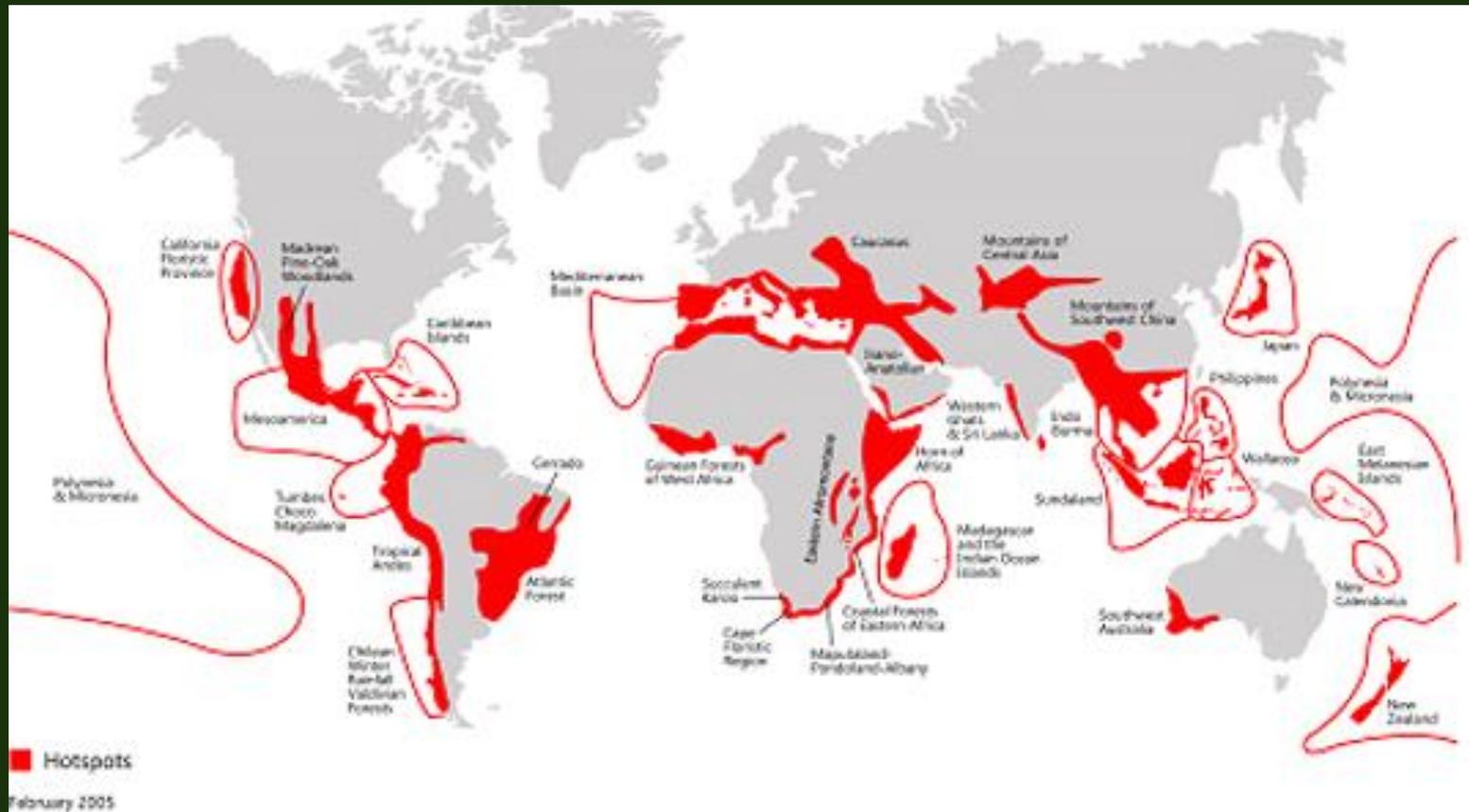
*Arctostaphylos mewukka* Indian Manzanita,  
an example of endemism

# California Floristic Province *Ecological Hotspot*

## Criteria:

- Over 1500 species of irreplaceable endemic vascular plants
  - CA has over 2100
- Less than 30% of original vegetation
  - CA has 24%



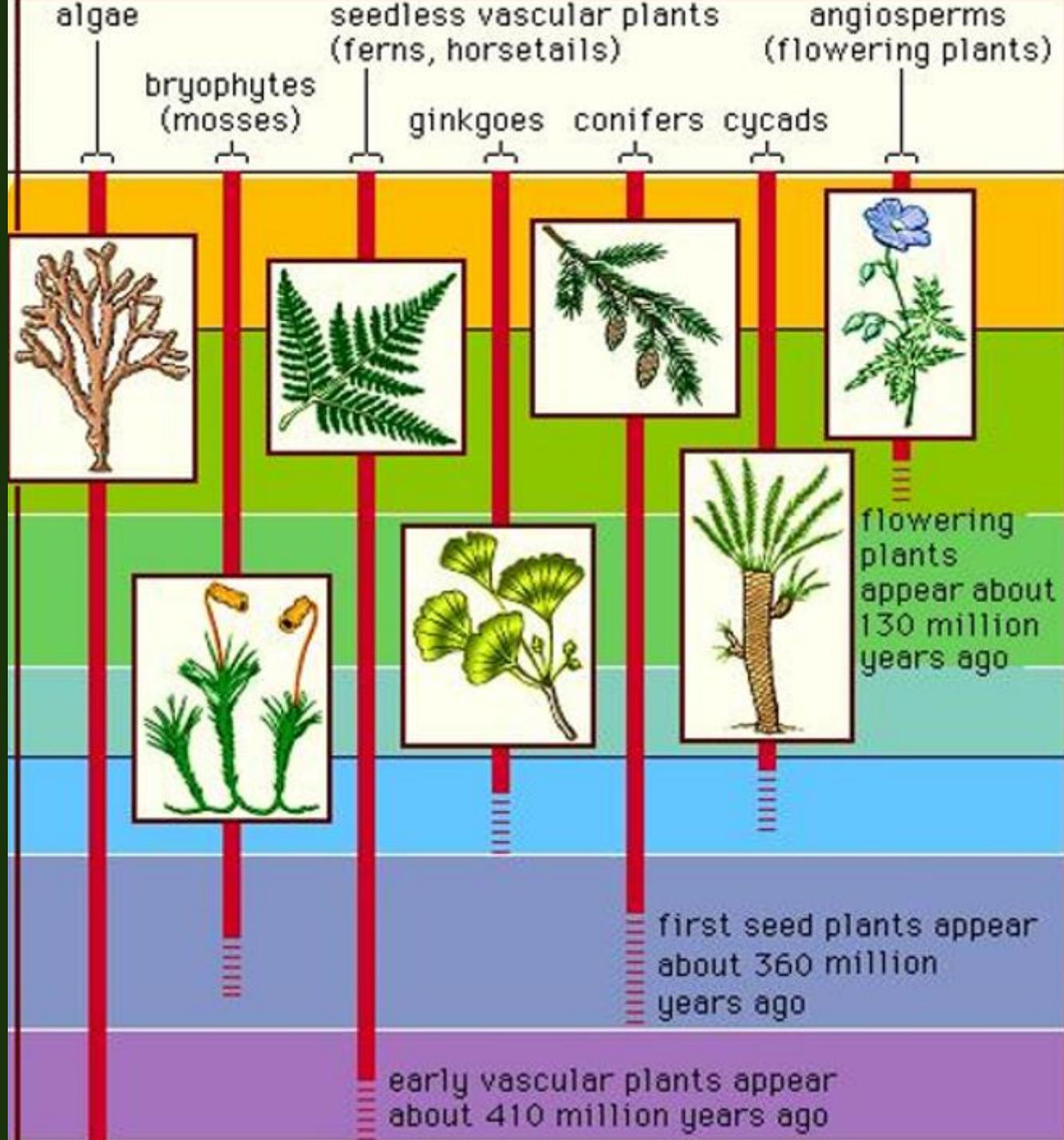


- 35 hotspots in the world
- Cover just 2.3% of Earth's land surface
- Support more than 50% of plant species
- California is one of just 5 Mediterranean hotspots



Plants evolved on varied substrates

They're evolving while we speak!

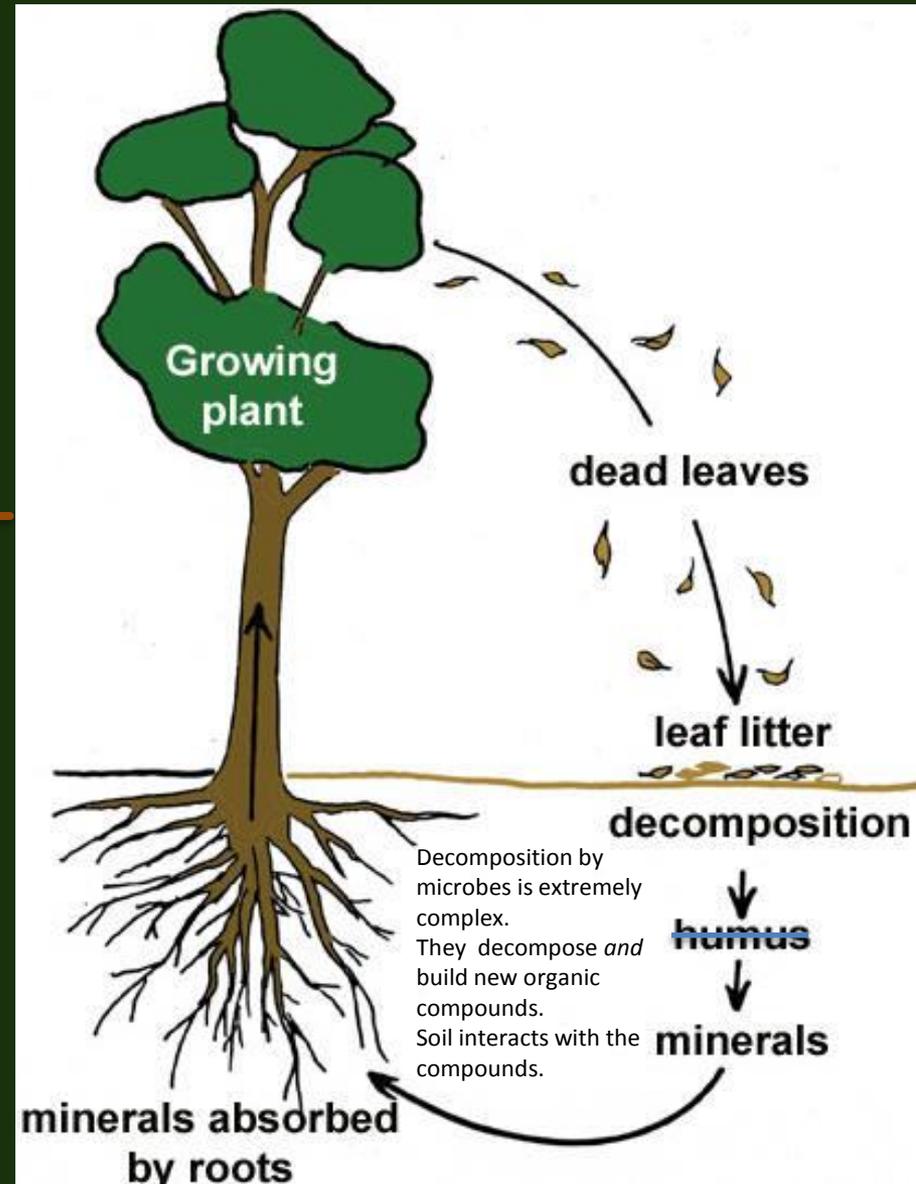


# Plants in nature don't use fertilizer

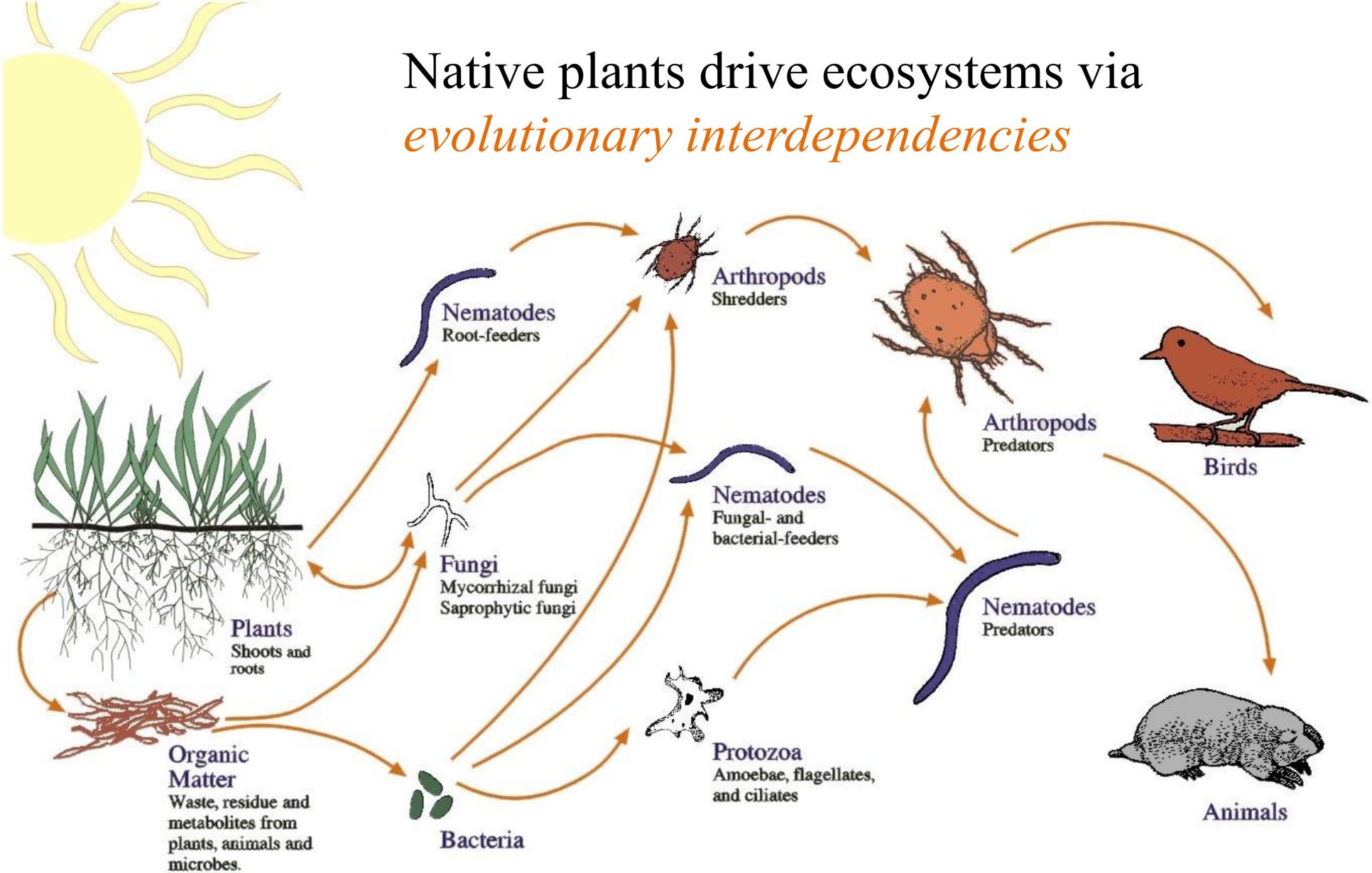
Organic matter:  
leaves, stems, animal  
manure, dead things...

Soil biota:  
decomposers (fungi,  
bacteria) and 'soil  
animals' (protozoa,  
nematodes)

Nutrient exchanges

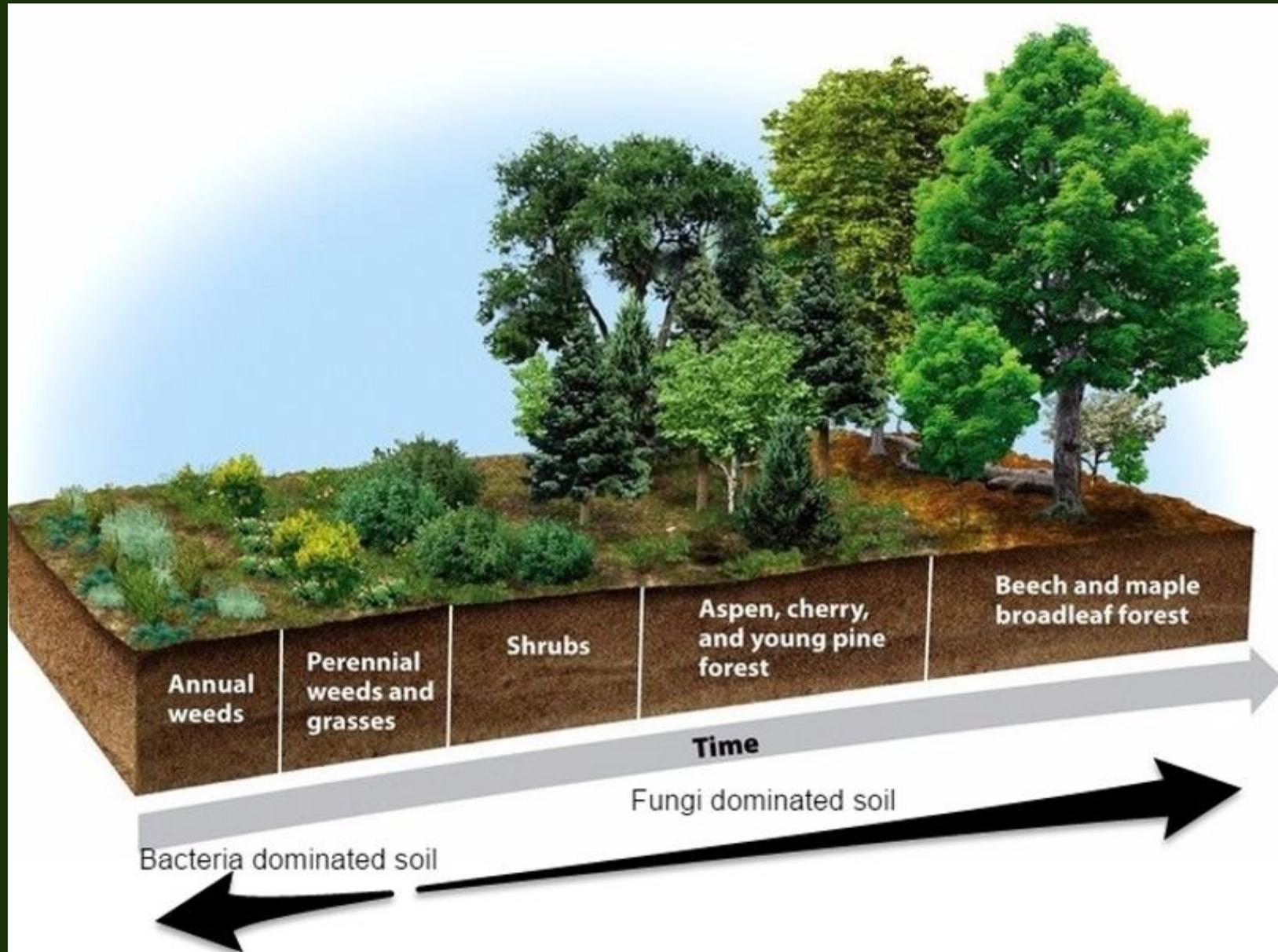


# Native plants drive ecosystems via *evolutionary interdependencies*



Each member provides *ecosystem services*

# There are multiple nutrition strategies



# Plants tend to congregate in overlapping *Plant Communities*

## Examples:

- Oak Woodland
- Chaparral
- Dry Perennial/Scrub
- Grassland
- Riparian

\* These are just the main plant communities around Placerville and Cameron Park

# Oak Woodland Community

5 main oak species  
(Blue, Valley, Interior,  
Canyon, and Black oak)

Grey pine

Toyon

Mexican elderberry

California bay

California black walnut

Shade-loving understory  
plants



Dry, partial shade under oak canopy  
Sunny dry between oaks

Toyon

*Heteromeles arbutifolia*



Mexican elderberry  
*Sambucus mexicana*



California Bay

*Umbellularia californica*



Pink flowering currant  
*Ribes sanguineum*



Golden currant  
*Ribes aureum*



# Chaparral Community

Dense, low shrubs and small trees:

- California fuchsia
- Chamise
- California Lilacs /  
Ceanothus
- Coffeeberry
- Toyon\*
- Manzanita
- Sugar bush
- Redbud

Gray Pine\*



In Spanish, chaparral means “little oak” for the scrub oak *Quercus dumosa*

Below:

Sierra mountain lilac  
*Ceanothus cuneatus*



Above:

Holly Leaf Mountain  
Lilac

*Ceanothus* “Blue  
Jeans”

Deer Resistant

Deer brush

*Ceanothus integerrimus*



California lilac

*Ceanothus* “Ray Hartman”



# California Coffeeberry

*Frangula californica*

*Rhamnus californica*



# Arctostaphylos



Sugarbush  
*Rhus ovata*



Western Redbud  
*Cercis occidentalis*



California fuschia

*Epilobium canum*

*Zauschneria canum*



# Dry Perennial / Scrub Community

Sages

Buckwheats

Monkeyflower

Sunflowers



# Many Salvias White Sage



Sonoma Sage-  
*Salvia sonomensis*



California buckwheat  
*Eriogonum fasciculatum*



Pink buckwheat  
*Eriogonum grande*



Sulphur buckwheat  
*Eriogonum umbellatum*



# Grassland Community

Perennial bunch grasses

Bulbs, corms, rhizomes

## Wildflowers

- Mustard
- Blue Dicks
- Tarweed
- Baby Blue Eyes
- Mariposa Lily
- Blue-eyed Grass
- Owl's clover
- Lupine



Blue Dicks

*Dichelostemma capitatum*



Heermann's tarweed

*Holocarpha heermannii*



Blue-eyed Grass  
*Sisyrinchium bellum*



# Riparian Community

Along streams,  
ponds

Alder, Ash,  
Cottonwood,  
Dogwood,  
monkeyflower,  
sedges, rushes

**NOT low-water--  
Need regular  
summer water**





# Communities let you

- Group by water need
- Observe soil needs
- Experience a sense of place
- Build habitat and corridors for wildlife

# Habitat and Corridors





## Habitat:

- Food
- Water
- Shelter
- Reproductive environment

Many insects and animals require native plants habitat

For example, ~65% of California butterflies must have

- a native plant *larval host*
- as well as *adult food plants* that may or may not be native, but are usually close relatives to natives

California hairstreak  
*Satyrium californica*

Adult food

Buckwheats, milkweeds,  
dogbane, and many other plants



# California hairstreak

*Satyrium californica*

## Larval hosts

*Amelanchier alnifolia* (Juneberry)

*Prunus virginiana* (Chokecherry)

*Cercocarpus* (Mountain Mahogany)

*Ceanothus* (Mountain Lilac)

*Quercus* (Oaks)

*Salix* (Willows)

Larval host must be in the  
vicinity of adult food plants



# Dutchman's Pipevine



# Dutchman's Pipevine Swallowtail



# Showy Milkweed



Photo: John Anderson





# Milkweed bug and narrowleaf milkweed seeds



Butterflies are  
*indicator species*

Rapidly respond  
to subtle habitat or  
climatic changes



American Painted Lady Butterfly,  
on salvia

96% of  
terrestrial  
bird  
species  
rear their  
young on  
insects



**Babies want bugs!**



# Art Shapiro's Butterfly Site

*Monitoring butterfly populations across Central California for more than 35 years...*

[Home](#) > [Art & Crew](#)

## Arthur M. Shapiro



Distinguished Professor

✉ [amshapiro@ucdavis.edu](mailto:amshapiro@ucdavis.edu)



### Websites

<http://butterfly.ucdavis.edu/>

### Degrees

1970	PhD	Entomology	Cornell University
1966	BA	Biology	University of Pennsylvania

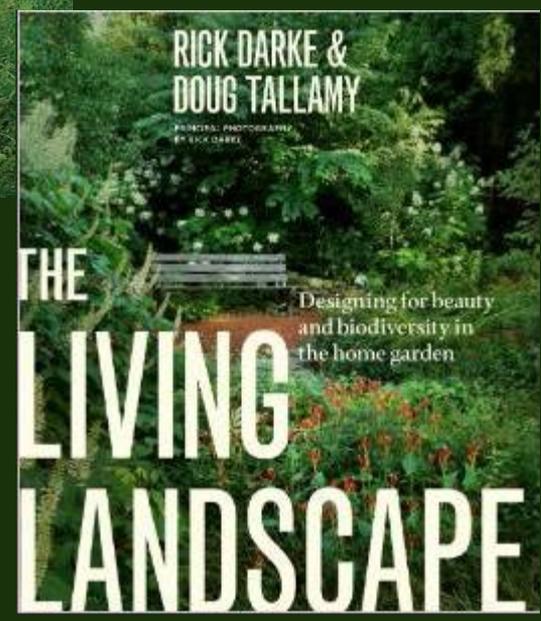
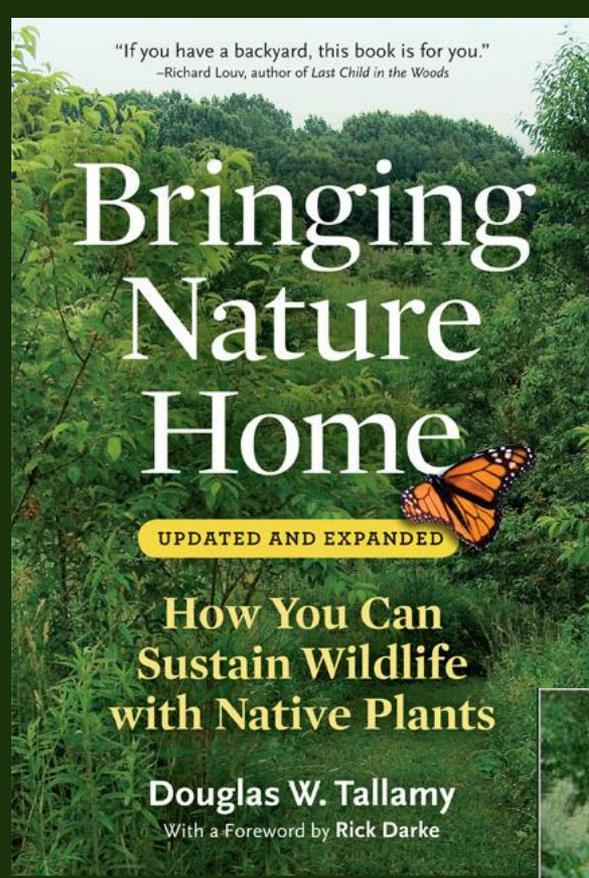


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<http://www.bringingnaturehome.net/>



Hypothesis:

Native plants  
support  
substantially  
more ecosystem  
members

We can  
measure the  
ecosystem  
value of  
natives and  
non-natives



July 25 2014

# Plant Choice = White Oak

Banded tussock moth	4
Nason's slug	2
Pear slugs	104
Bagworms	3
Leaf-tip rollers	21
Yellow-necked caterpillar eggs	80
Yellow-necked caterpillars	115
Pyralid leaf rollers	4
Saddled prominent	3
Tortricid leaf tiers	34
Leaf miners	12
Geometrid inch worm	1
Bucculatrix ainsliella	1
Midrib webber	5
White-dotted prominent	2
Double-lined prominent	2
Douglasiidae	1
Lepidoptera eggs	12
Leaf folders	4

**410 caterpillars**  
**19 species**



# Plant Choice = Black Cherry

239 caterpillars  
14 Species

Pear slugs	12
Saddleback caterpillar	1
Leaf-tier	1
Tent caterpillar eggs	175
Tenthredinid sawfly	1
Bucculatrix pomifoliella	8
Leaf –folder	3
Tufted bird dropping moth	2
Ugly nest caterpillar	13
Leaf miners	16
Large Pyralid	1
Acleris variegata	1
Bagworm	1
Leaf-roller	4



# Plant Choice = Bradford Pear

1 Caterpillar  
1 Species

Geometrid inchworm 1



# PLANT-O-RAMA

Metro Hort Group

January 27, 2015

@Brooklyn Botanic Garden

Plant genera ranked in terms of the number of caterpillar species (parentheses) they support

## Doug Tallamy

- Quercus* (557) (Oaks)
- Prunus* (456) (Cherries)
- Salix* (455) (Willows)
- Betula* (411) (Birches)
- Populus* (367) (Populars)
- Malus* (308) (Crabapples)
- Acer* (297) (Maples)
- Vaccinium* (294) (Blueberries)
- Alnus* (255) (Alders)
- Carya* (235) (Hickories)
- Ulmus* (215) (Elms)
- Pinus* (201) (Pines)
- Crataegus* (168) (Hawthorns)
- Rubus* (163) (Berries)
- Picea* (150) (Spruces)
- Fraxinus* (149) (Ashes)
- Tilia* (149) (Linden)
- Pyrus* (138) (Pears)
- Rosa* (135) (Roses)
- Corylus* (131) (Filberts)
- Juglans* (129) (Walnuts)
- Castanea* (127) (Chestnuts)
- Fagus* (127) (Beeches)
- Amelanchier* (124) (Serviceberry)

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- Ulmus* (215) (Elms)
- Pinus* (201) (Pines)

- Larix* (121) (Larches)
- Cornus* (118) (Dogwoods)
- Abies* (117) (Firs)
- Myrica* (108) (Bayberries)
- Viburnum* (104) (Viburnums)
- Ribes* (99) (Currants)
- Ostrya* (94) (Hophornbeam)
- Tsuga* (92) (Hemlocks)
- Spiraea* (89) (Spireas)
- Vitis* (79) (Grapes)
- Pseudotsuga* (76) (Douglasfir)

- Liquidambar* (35) (Sweetgums)
- Kalmia* (33) (Mountain-laurel)
- Aesculus* (33) (Buckeyes)
- Parthenocissus* (32) (Virginia Creeper)
- Photinia* (29) (Photinias)
- Nyssa* (26) (Black Gums)
- Symphoricarpos* (25) (Snowberries)

- Pydonia* (24) (Quince)
- Ligustrum* (24) (Privets)
- Shepherdia* (22) (Buffaloberries)
- Liriodendron* (21) (Tuliptrees)
- Magnolia* (21) (Magnolias)
- Cephalanthus* (19) (Buttonbush)
- Cercis* (19) (Redbuds)
- Smilax* (19) (Green-briar)
- Wisteria* (19) (Wisterias)
- Persea* (18) (Redbay)
- Arctostaphylos* (17) (Bearberry)
- Ricinus* (16) (Castorbean)
- Taxodium* (16) (Baldcypresses)
- Chamaedaphne* (15) (Leatherleaf)
- Toxicodendron* (15) (Poison Ivy)
- Oxydendrum* (14) (Sourwood)
- Ampelopsis* (13) (Porcelainberry)
- Arbutus* (12) (Madrone)
- Asimina* (12) Pawpaw)
- Berberis* (12) (Barberries)
- Acacia* (11) (Acacia)
- Euonymus* (11) (Euonymus)
- Frangula* (11) (Buckthorn)
- Lindera* (11) (Spicebush)
- Lyonia* (11) (Fetterbush)
- Caragana* (10) (Peashrubs)
- Clethra* (10) (Summersweet Clethra)
- Rhamnus* (10) (Buckthorns)
- Pyracantha* (9) (Firethorns)
- Morus* (9) (Mulberries)
- Elaeagnus* (9) (Russian-olive)
- Chaenomeles* (8) (Floweringquince)
- Cytisus* (8) (Scotchbroom/broom)
- Ficus* (8) (Fig)
- Catalpa* (8) (Catalpa)
- Chamaecyparis* (8) (Falsecypress)
- Chionanthus* (8) (Fringetree)
- Maclura* (8) (Osage-orange)
- Taxus* (8) (Yew)



# California Oakworm



# Propertius Dusky Wing



# Western Tussock Moth



# Checkered Skipper



We need  
these  
insects in  
our yards

Mammals need  
insects, too

Did you know that  
23% of a black  
bear's diet is  
insects?



Climate change is  
impacting natives plants  
and animals

Moving to higher elevations  
and northward

Migration patterns and food  
sources disrupted

Historically,  
California has  
always had  
droughts

Typically 50- to 90-year  
cycles of wet and dry

Many droughts longer  
than 10 years

Between 900 and 1400  
A.D., two droughts that  
were over 100 years



The past 100-150 years have been  
the WETTEST in 7,000 years

We've  
lost **75%**  
of plant  
species



# Fewer food sources = less biodiversity



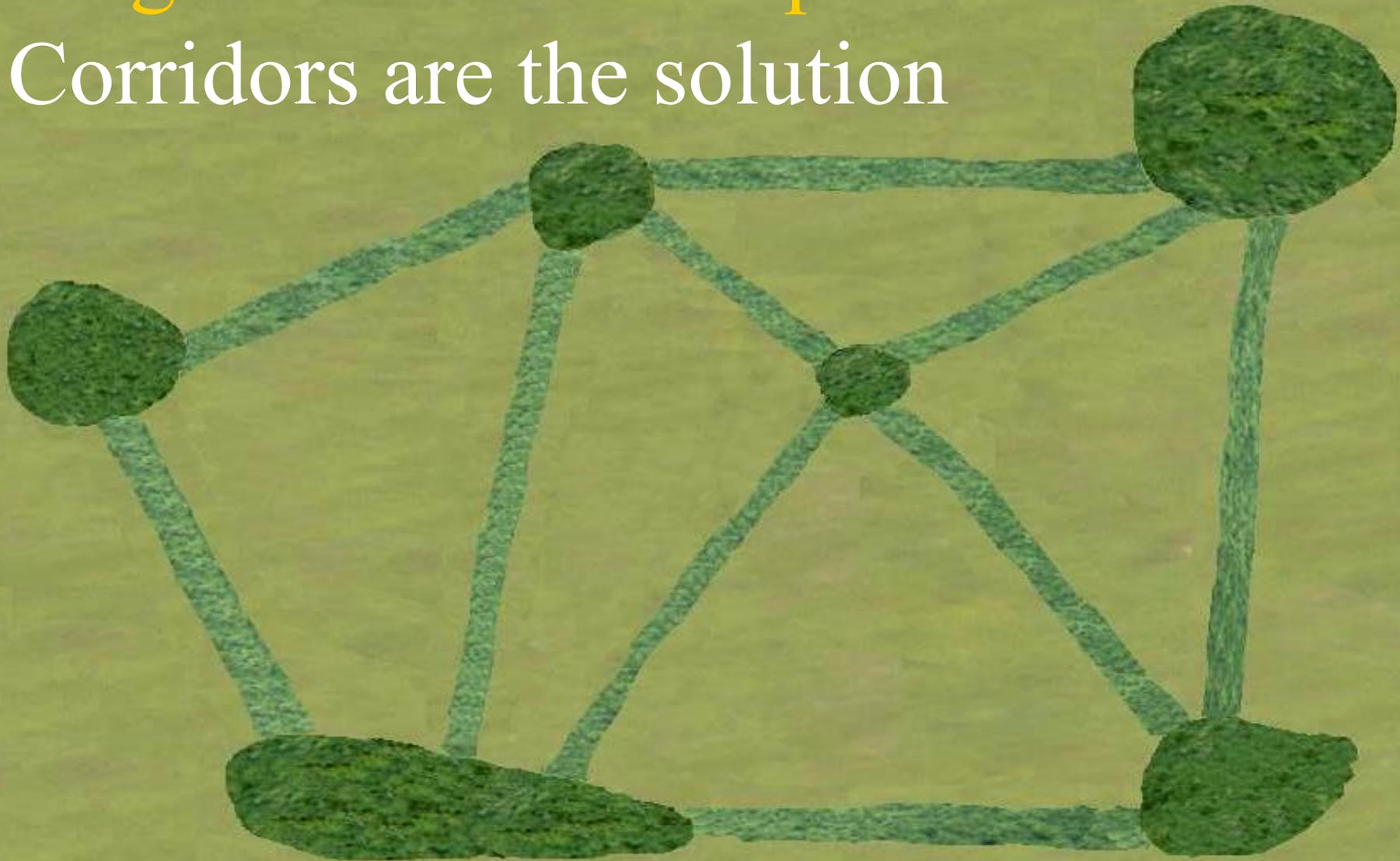
Biodiversity  
requires  
large,  
connected  
natural  
habitats

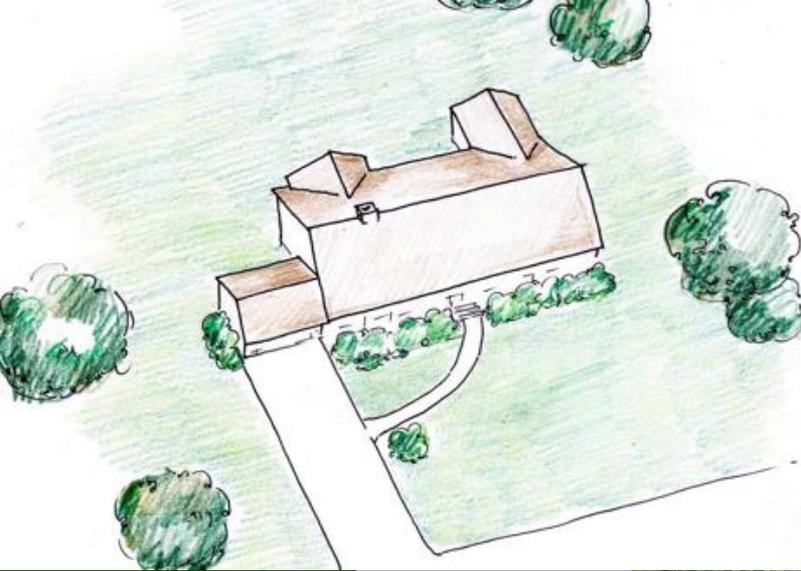


Isolated populations can't  
maintain genetic diversity

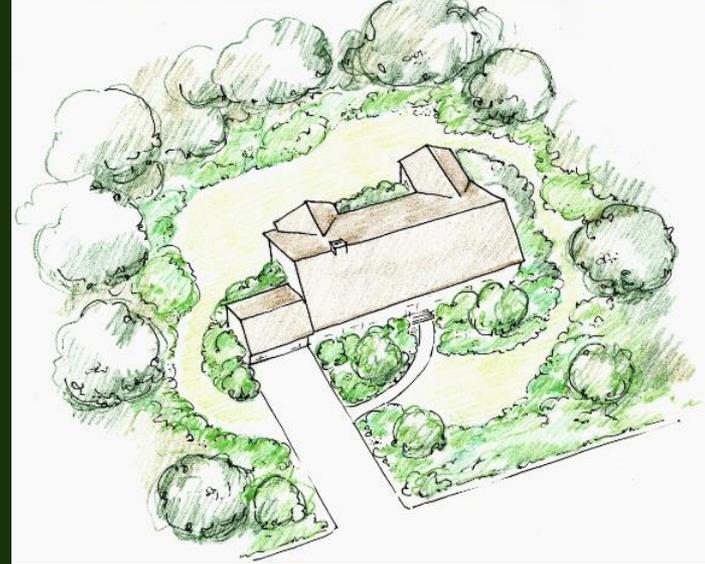
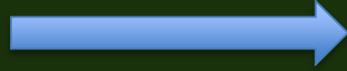
Genetic “bottlenecks” weaken  
species and create opportunities  
for invasive species

Fragmentation is the problem  
Corridors are the solution





Start with  
your own  
home



Talk with  
your  
neighbors



In time,  
you'll  
have a  
corridor