

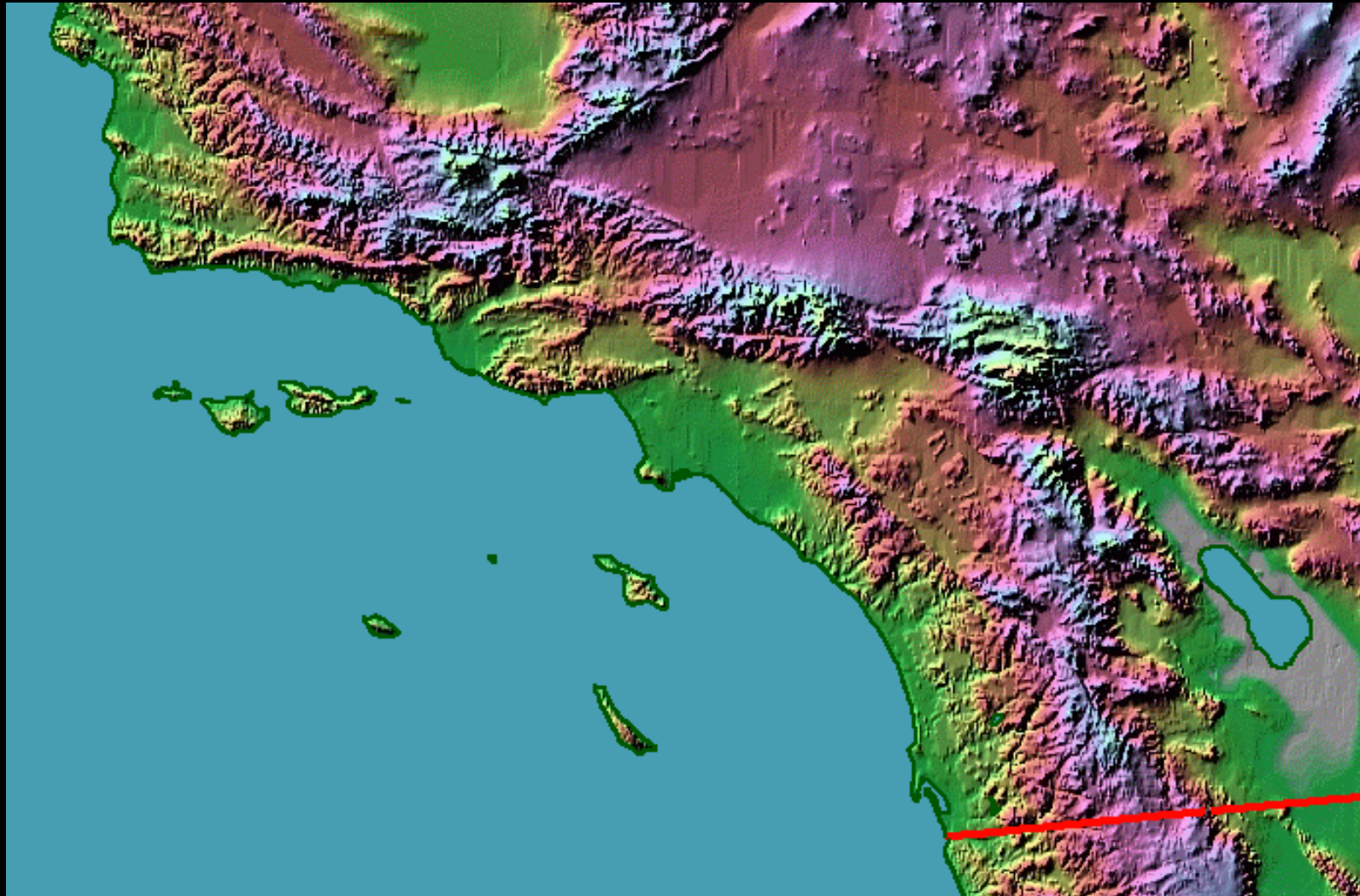
Invasions in Cities: Threats, Neutral or Over-Reaction

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Geologically Active & Varied



Biodiversity



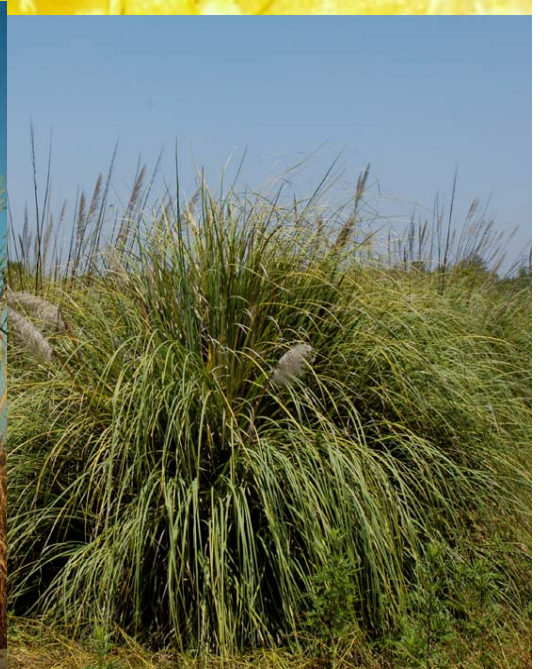
Threats: Development & Fragmentation



Threat – Climate Change



Threat? - Invasions



INVASIVE SPECIES:

1. Non-native
2. Spread following introduction
3. Cause economic or environmental damage

Yes

**(some invasive species in some places
are indeed threats)**

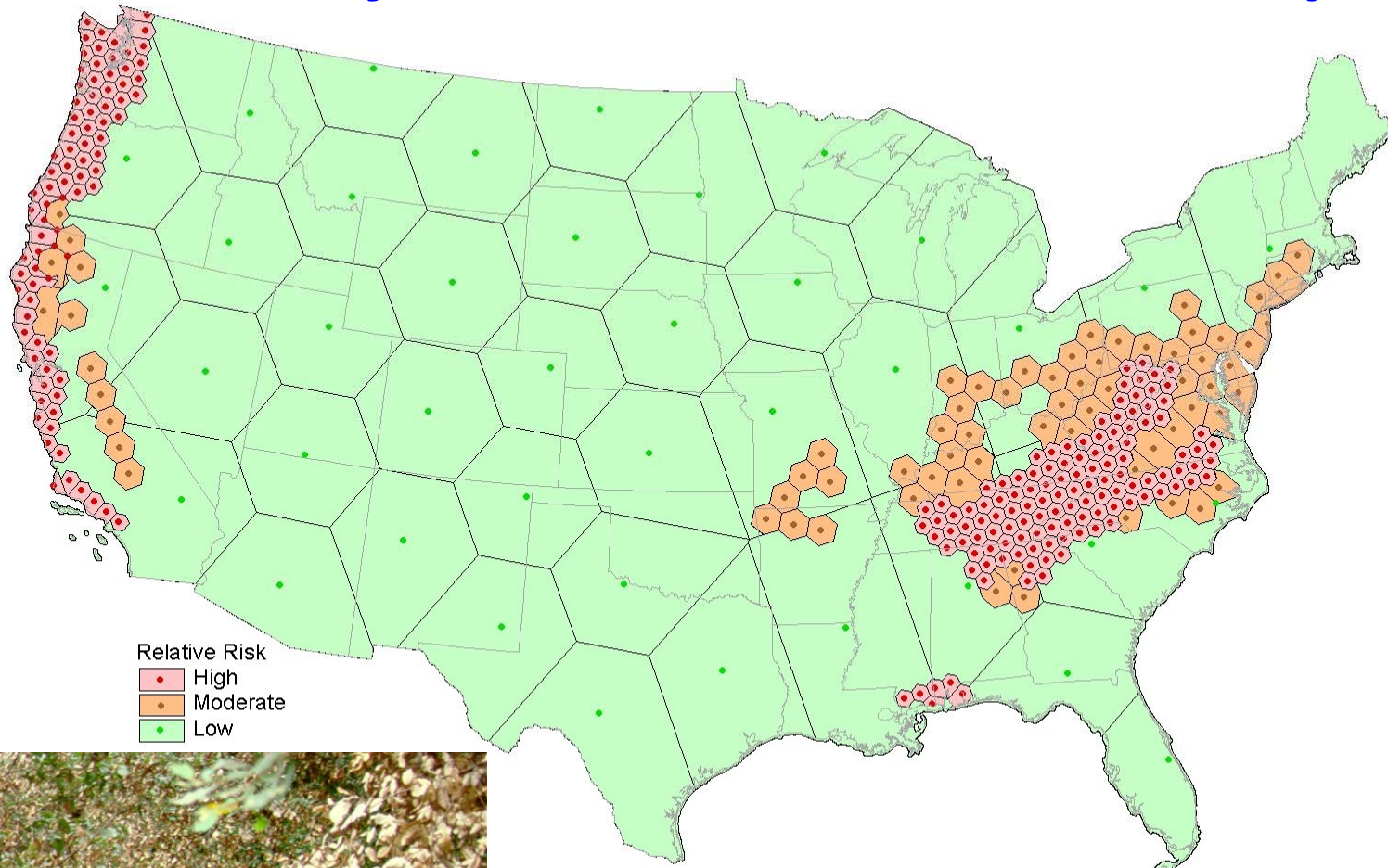
Cooperative Emerald Ash Borer Project

Initial county EAB detections in Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Tennessee, Virginia, Wisconsin, West Virginia and Canada

October 4, 2011



Preliminary Sudden Oak Death Risk Map



Sudden Oak Death – Big Sur, Calif.
Phytophthora ramorum on *Lithocarpus densiflorus*

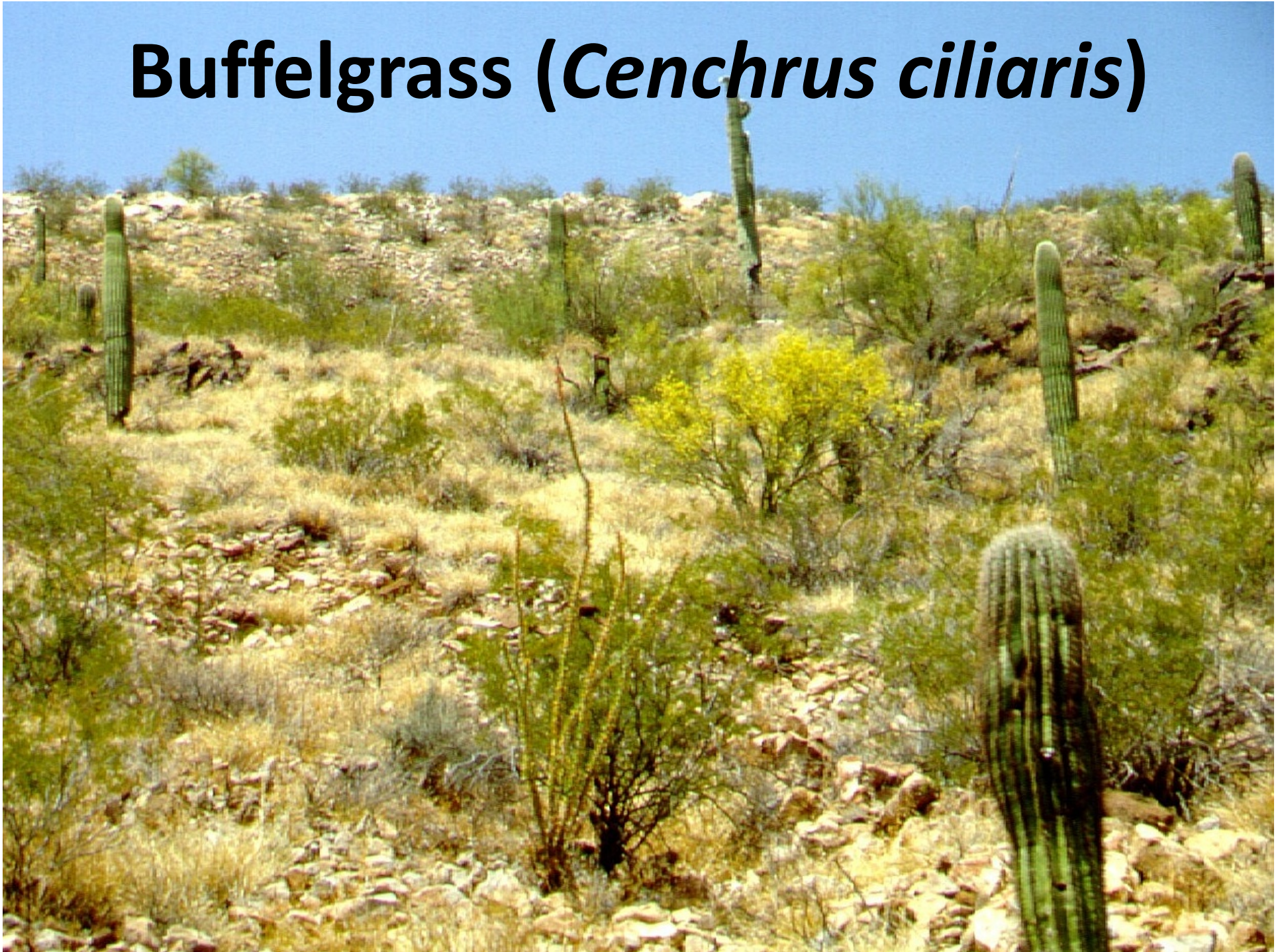


Cape ivy (*Delawarea odorata*)
Bonsall Preserve, San Diego County



***Caulerpa taxifolia* in San Diego County**

Buffelgrass (*Cenchrus ciliaris*)



**Even National Parks
and other protected
areas can be
invaded and
degraded.**

**Bull thistle
(*Cirsium vulgare*)**



IMPACTS

- **Ecosystem Level Impacts**

- Fire Frequency & Intensity
- Hydrology
- Geomorphological Processes (erosion, sedimentation)
- Soil Chemistry & Nutrient Cycles

- **Community & Population Level Impacts**

- Vegetation Structure
- Community Composition
- Competition for Food, Nest Sites & Other Resources (light, water, nutrients)
- Kill Native Plants or Animals
- Promote Non-native Invasive Animals
- Reduce Recruitment of Natives (Succession)
- Vector pathogens and pests (e.g. chestnut blight vectored by Asian chestnut)

- **Genetic Impacts**

- Hybridization with Native Species

- **Lack of Impacts**

- **Positive Impacts**

Prevention

Many potential invaders....

Few Pathways.





Assessment
Prevention
Early Detection
Control & Restoration
(& Learning to Live With The Incurrigibles)

Continental

Ecoregion

Landscape

Small Park





NOTICE

ATTENTION
M BAGS TO BE CO
LABELLED ON THE
BAG & NOT THE
TAG.

A key approach to preventing invasions:

Collaboration with Industries to voluntarily change practices:
Cal-HIP (California Horticulture Invasives Prevention)



Maybe

**Monterey
Pine**



***Pinus
Radiata***



Geraldton wax
Chamelaucium uncinatum

Species distribution model projection for coast horned lizard (*Phrynosoma coronatum*)

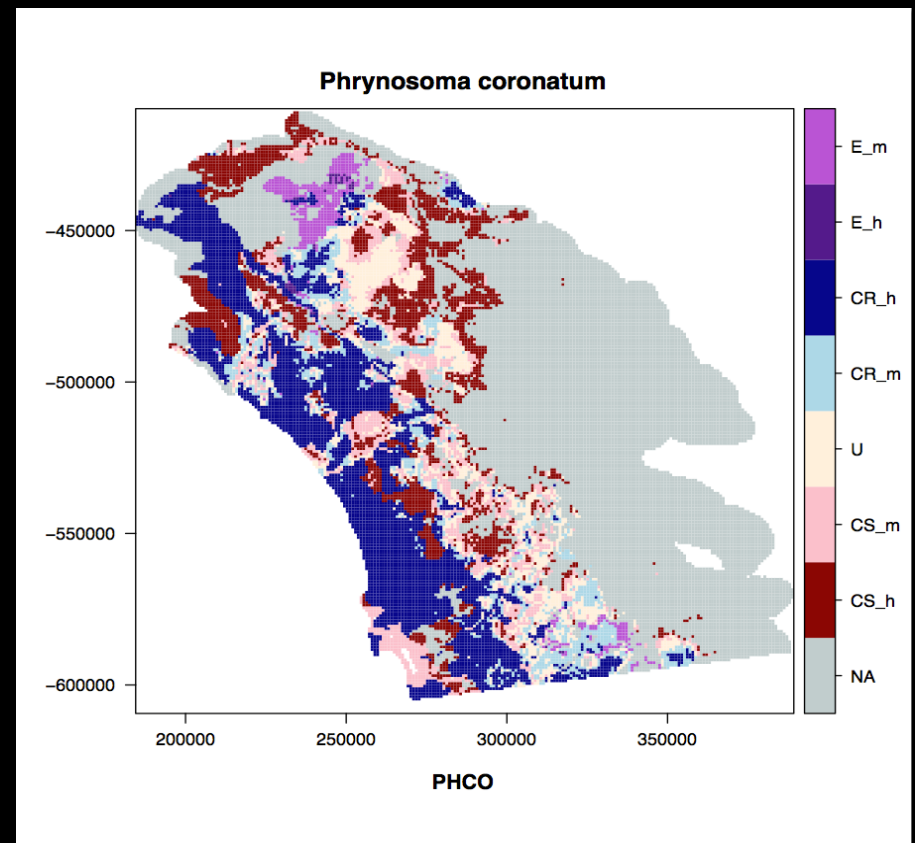
Species distribution forecast for the Coast horned lizard distinguish three potential outcomes in roughly 50 years:

Climate Refugia (blue)

Climate Stress (red)

Range Expansion (purple)

High ('h'; $\geq 80\%$) and medium ('m'; $\geq 60\%$) levels of consensus across all future scenarios are indicated by color saturation (dark and light, respectively).



NO
(we've overreacted)



For example:

Fennel (*Foeniculum vulgare*) on Santa Cruz Island



**Red crowned parrots (*Amazona viridigenalis*)
San Diego, San Francisco, etc.**





