

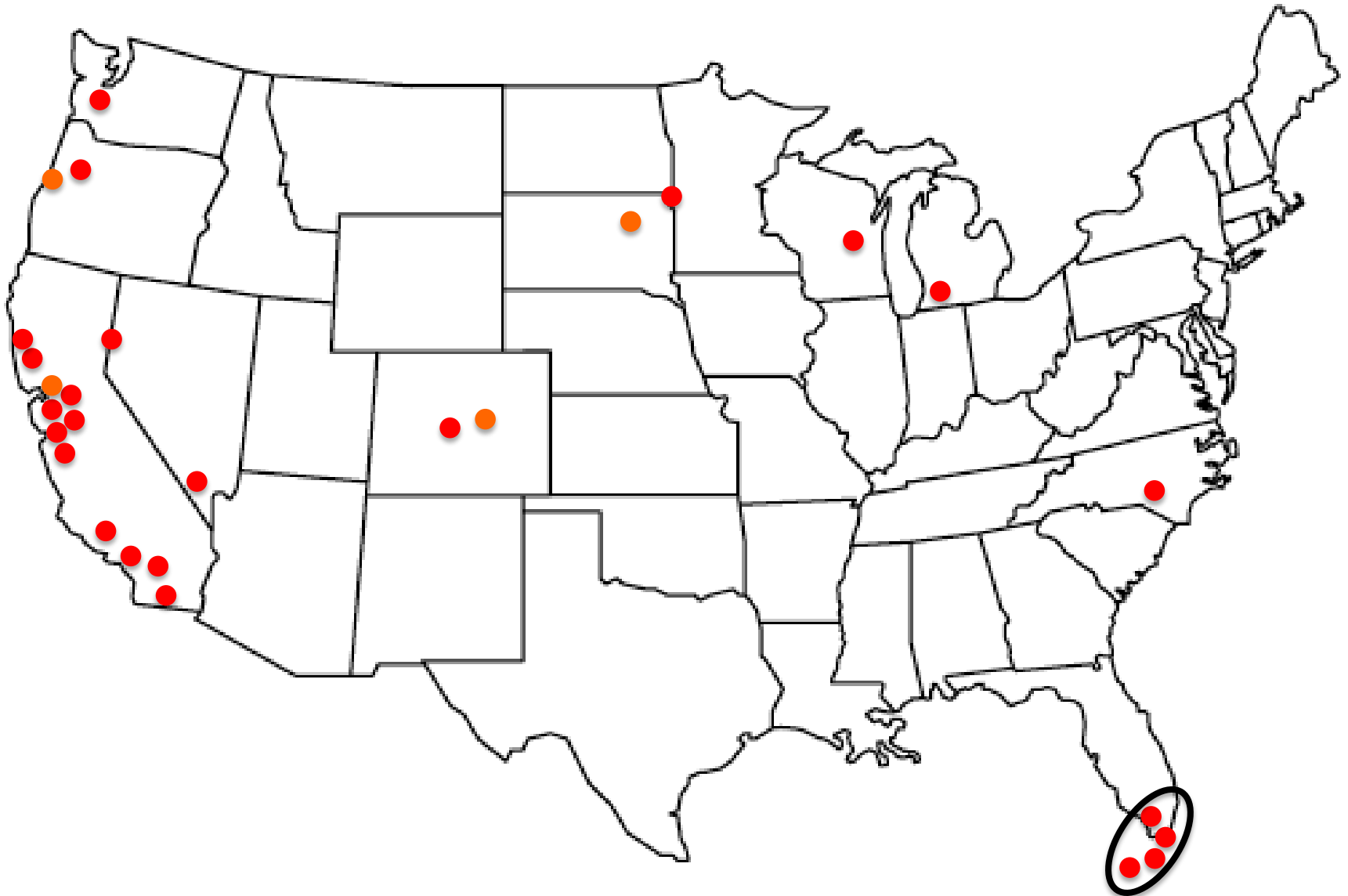


Miami blue



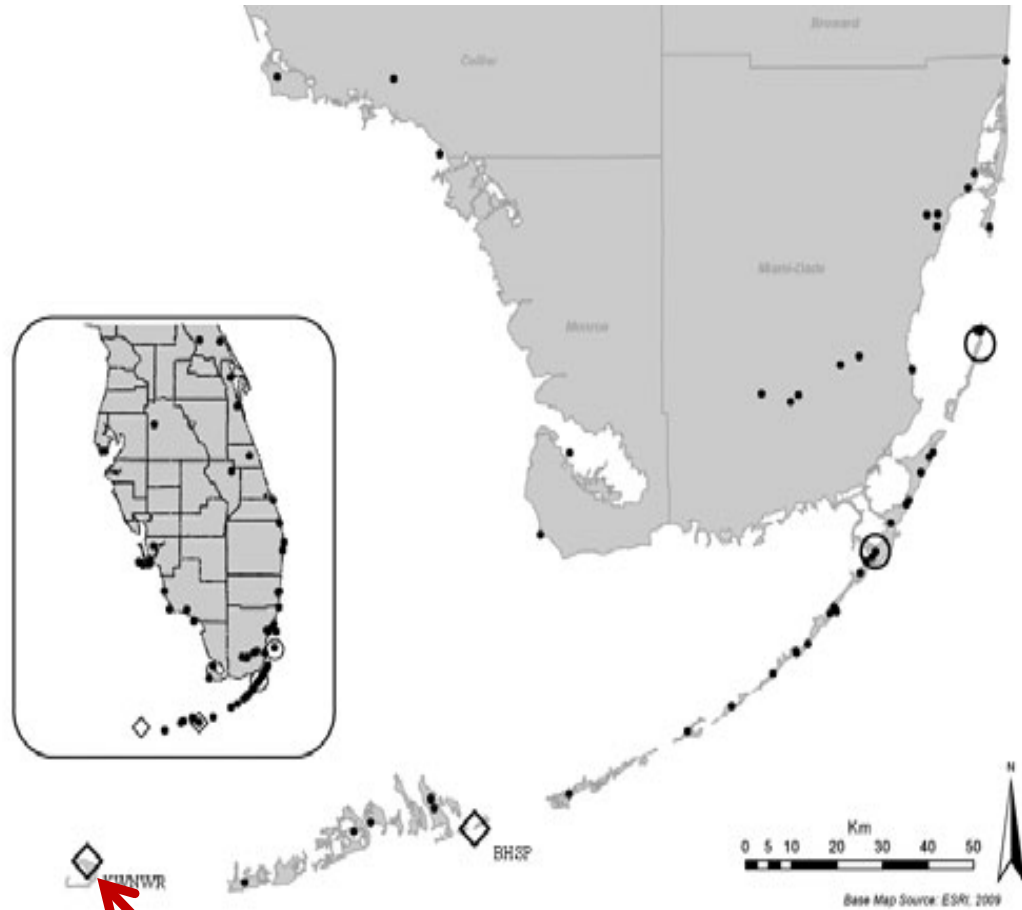
Bartram's scrub-hairstreak

ESA listed butterflies



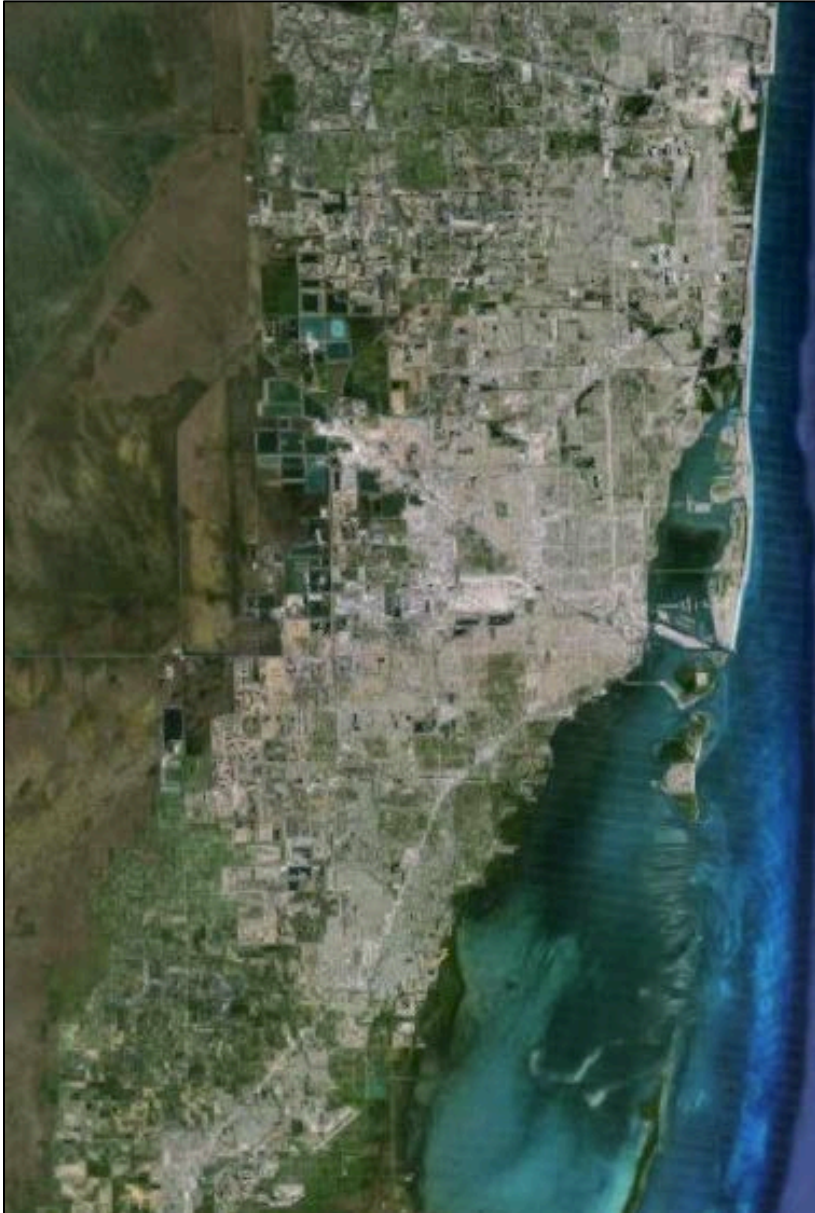


Miami blue butterfly (*Cyclargus thomasi bethunebakeri*)

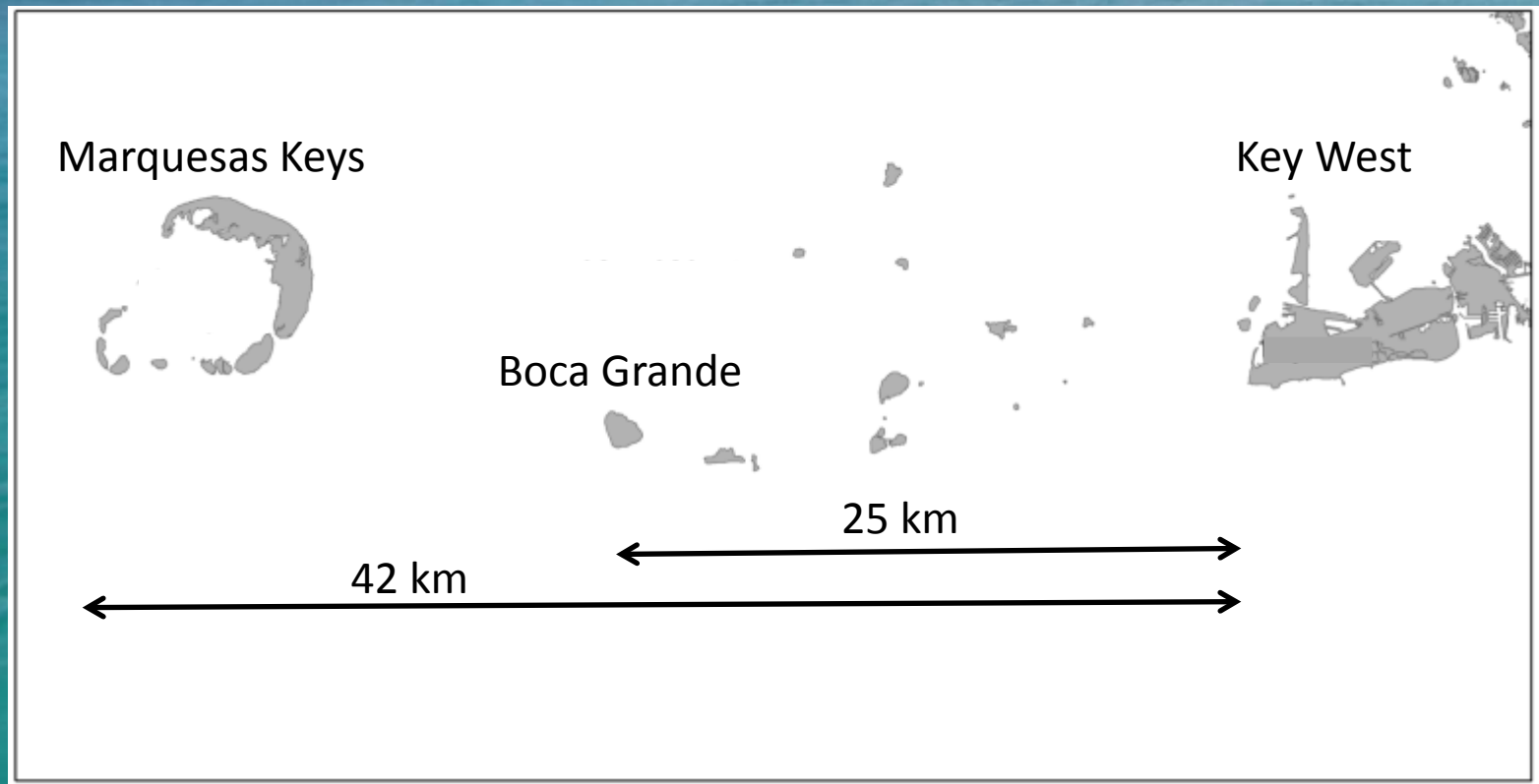


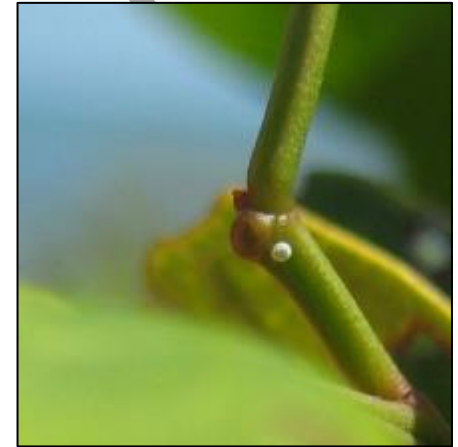
Last remaining
population

Habitat Loss

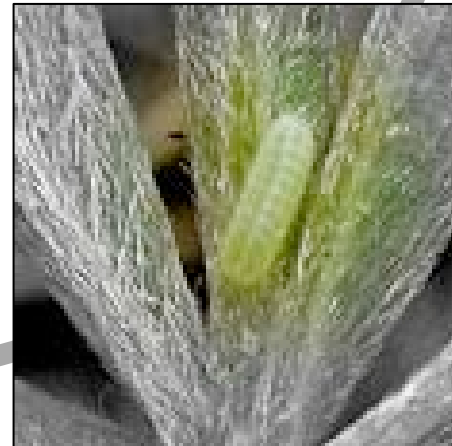


Miami blues occupy remote, low-lying islands





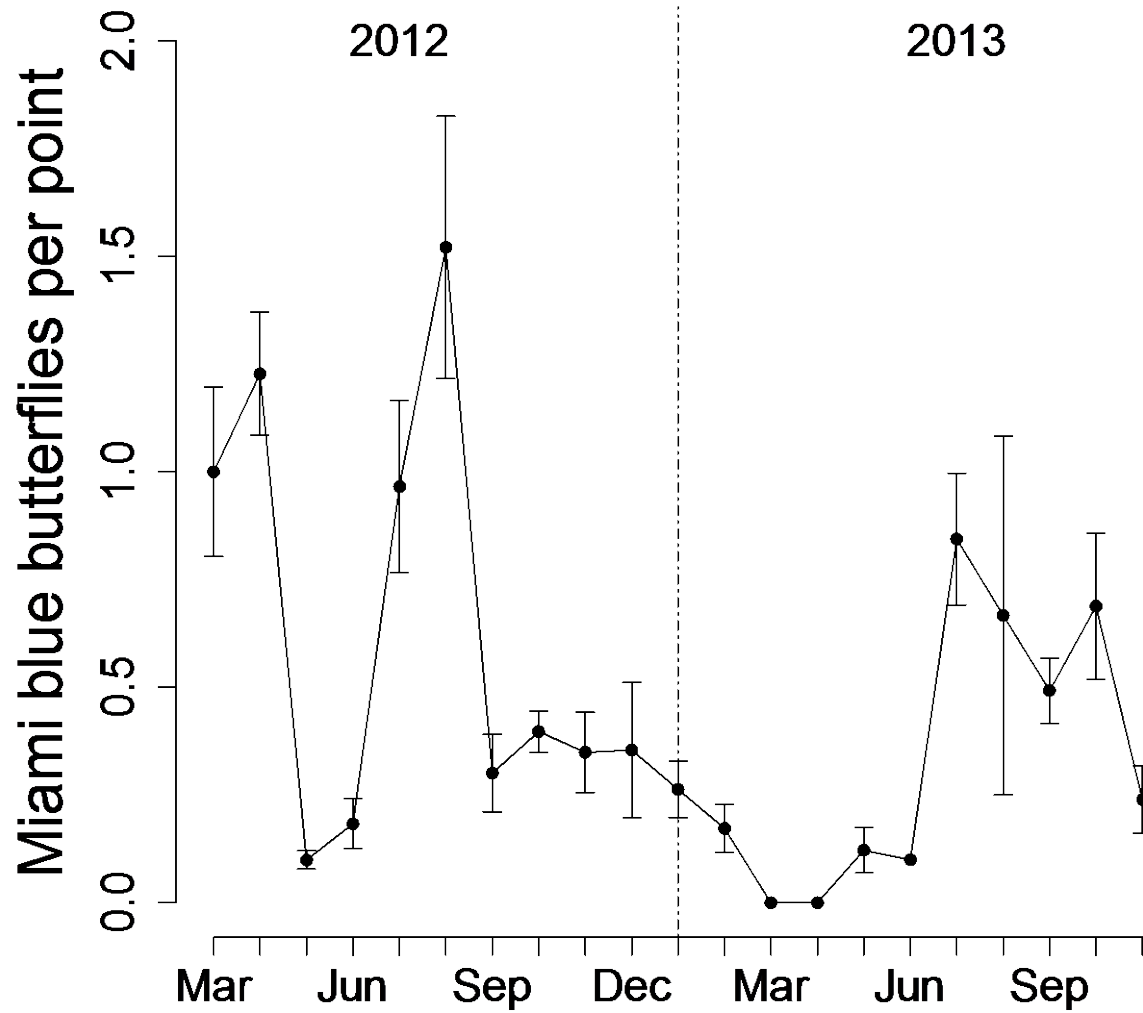
Life cycle depends
on host plant



Temperate butterflies

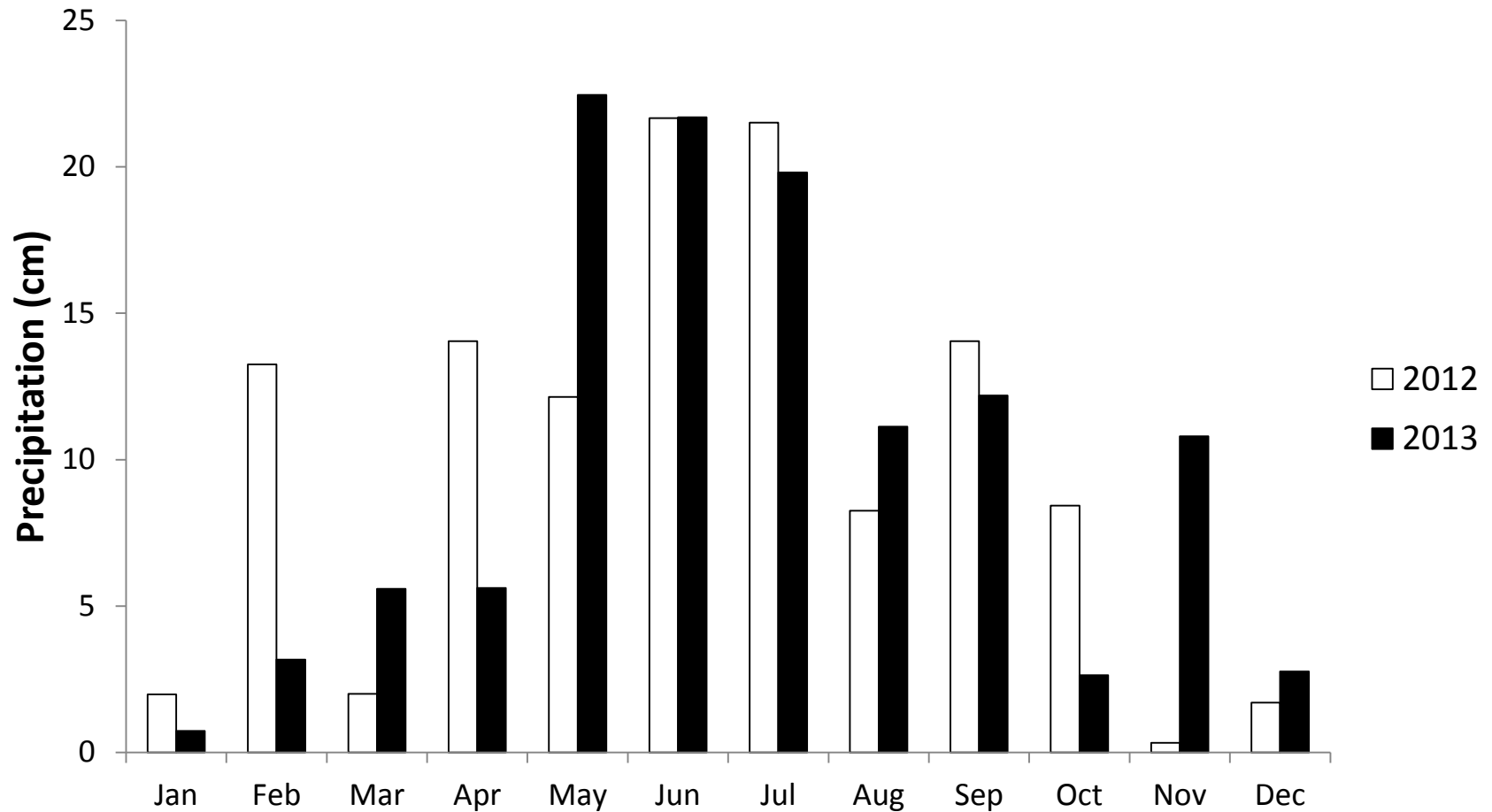


High year-to-year variability

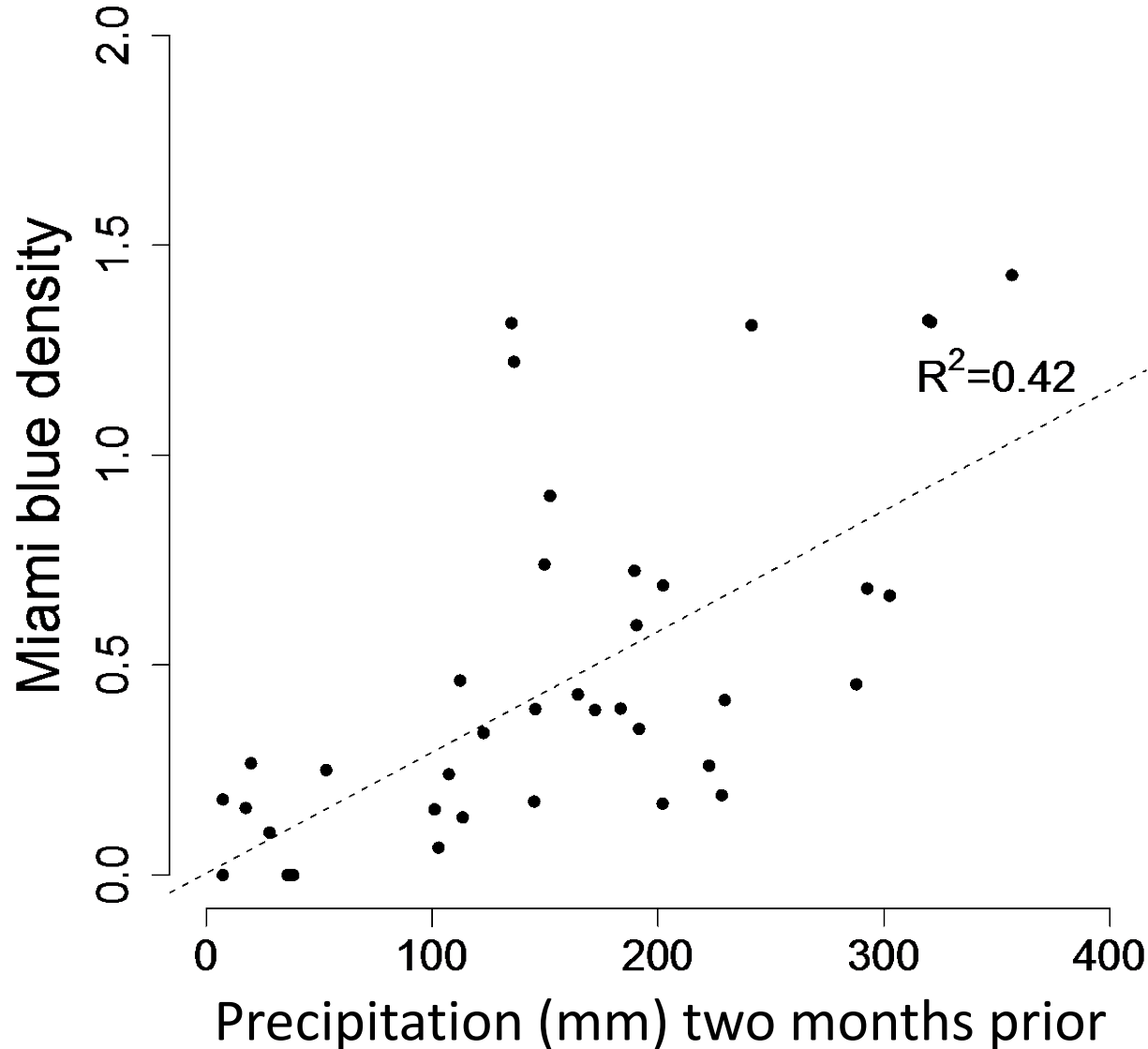




Precipitation patterns are highly variable

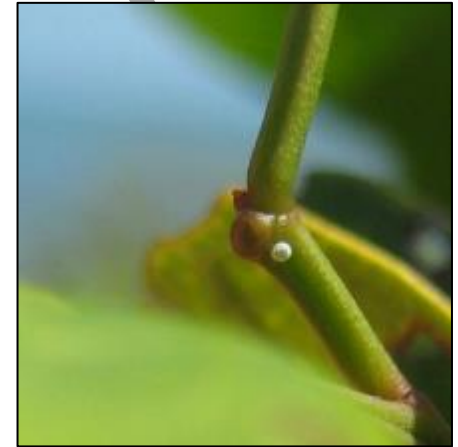


Previous precipitation drives butterfly abundances

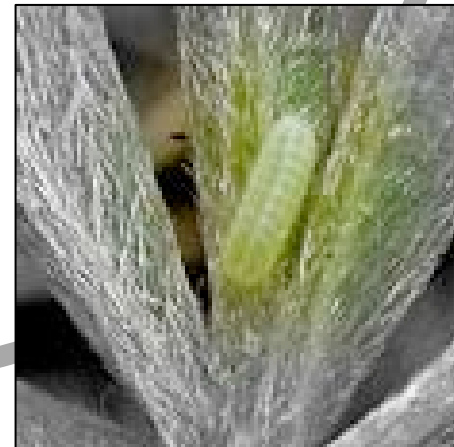




Drought-induced
pause?

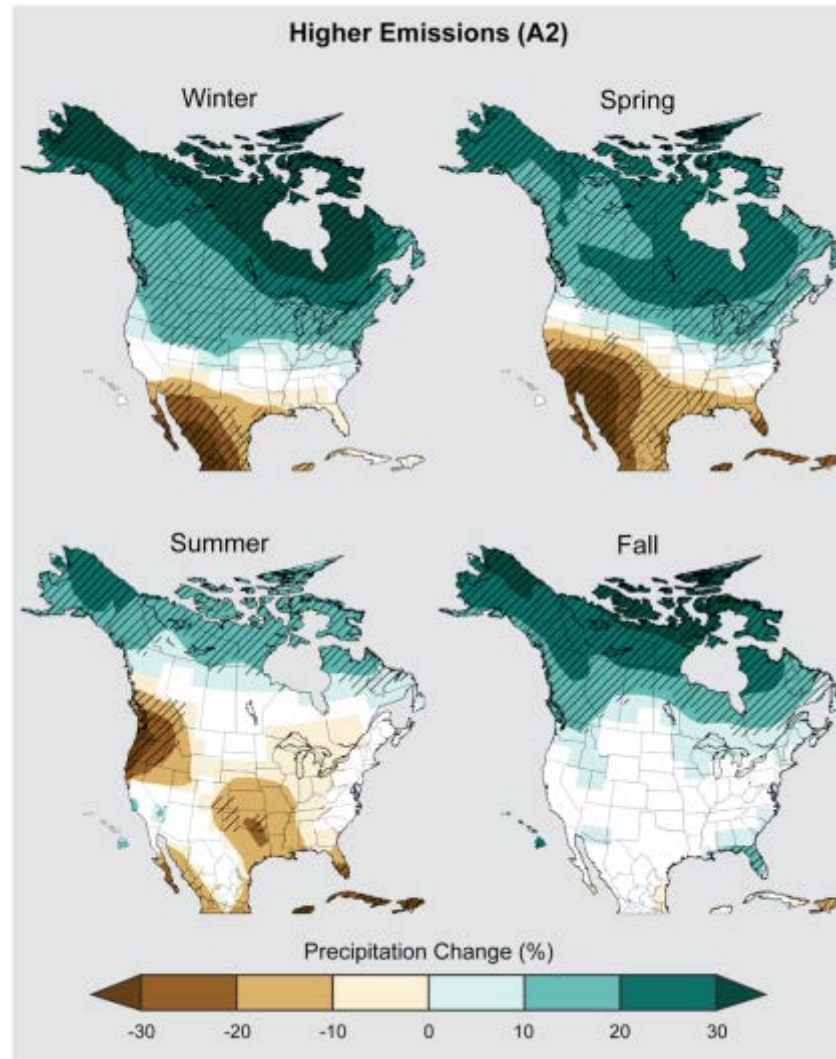


?



Threat of future droughts?

Projected Precipitation Change by Season



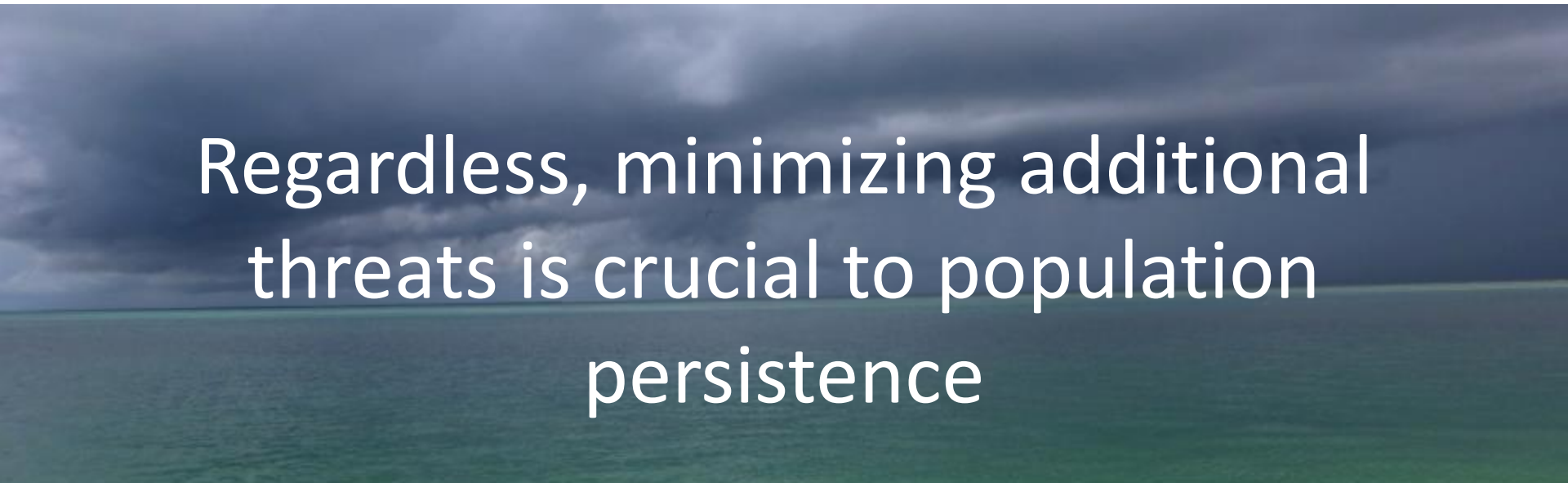
Analysis of future population dynamics

- How do changes in precipitation affect Miami blue populations?
- What is the most immediate threat, sea level rise or drought?



Analysis of future population dynamics

- How do changes in precipitation affect Miami blue populations?
- What is the most immediate threat, sea level rise or drought?



Regardless, minimizing additional threats is crucial to population persistence

Bartram's scrub-hairstreak
(*Strymon acis bartrami*)
habitat restoration



Photo: Chad Anderson



Loss of Rockland Habitat in Dade County

1996: 8,140 hectares

1900: 74,000 hectares



0 10 20
Kilometers

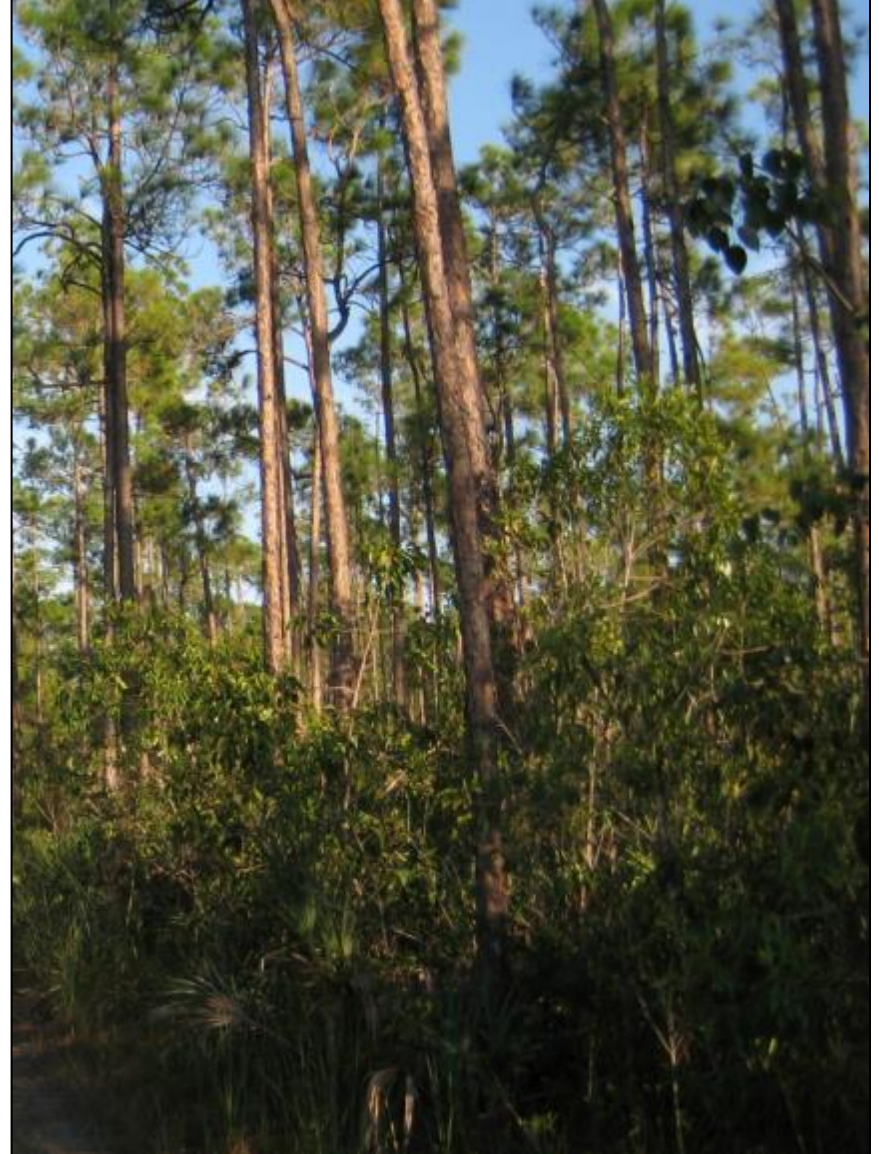
— Dade County
— Rockland habitat

FAIRCHILD
TROPICAL
GARDEN

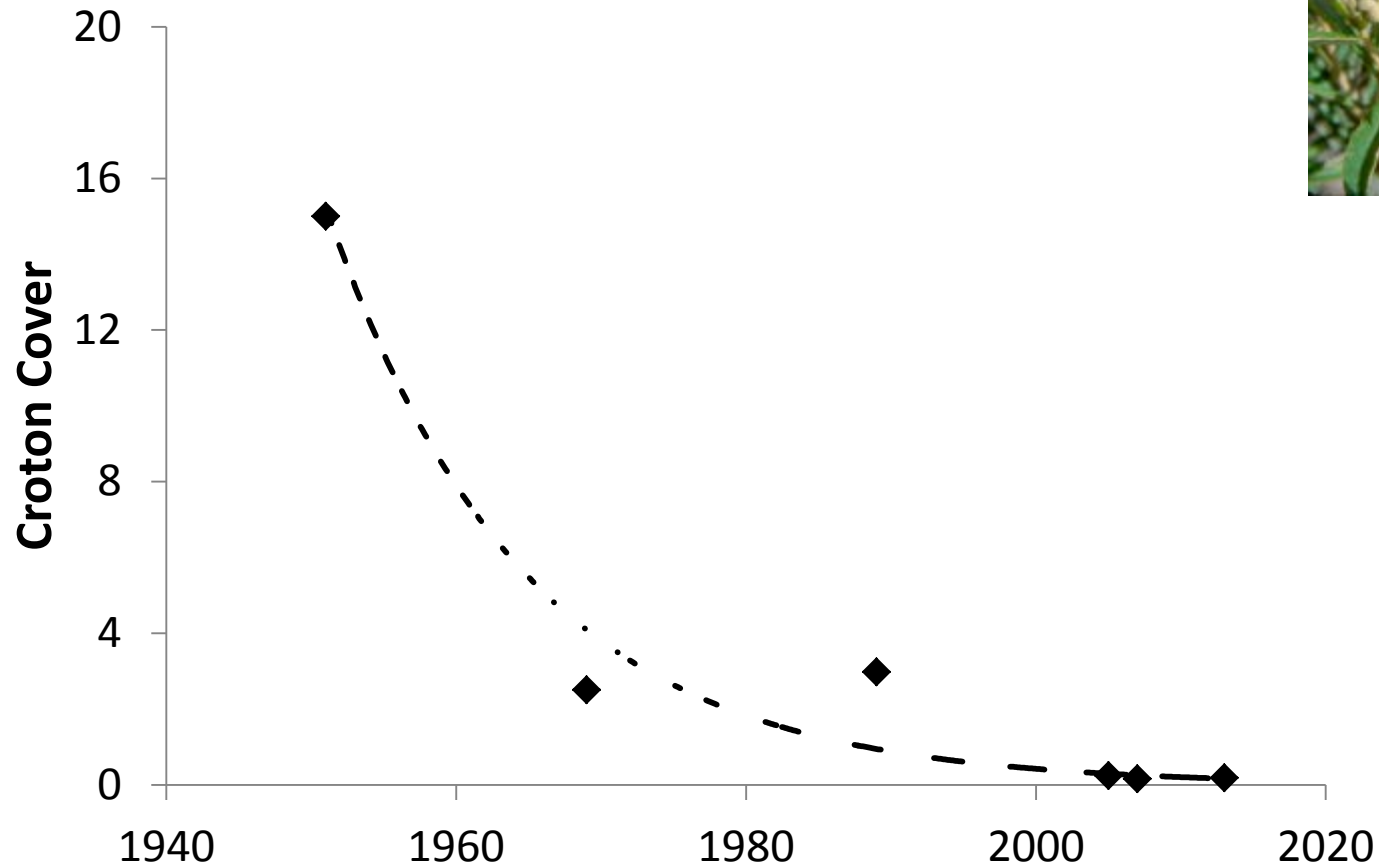
data and map prepared by Christopher Korman



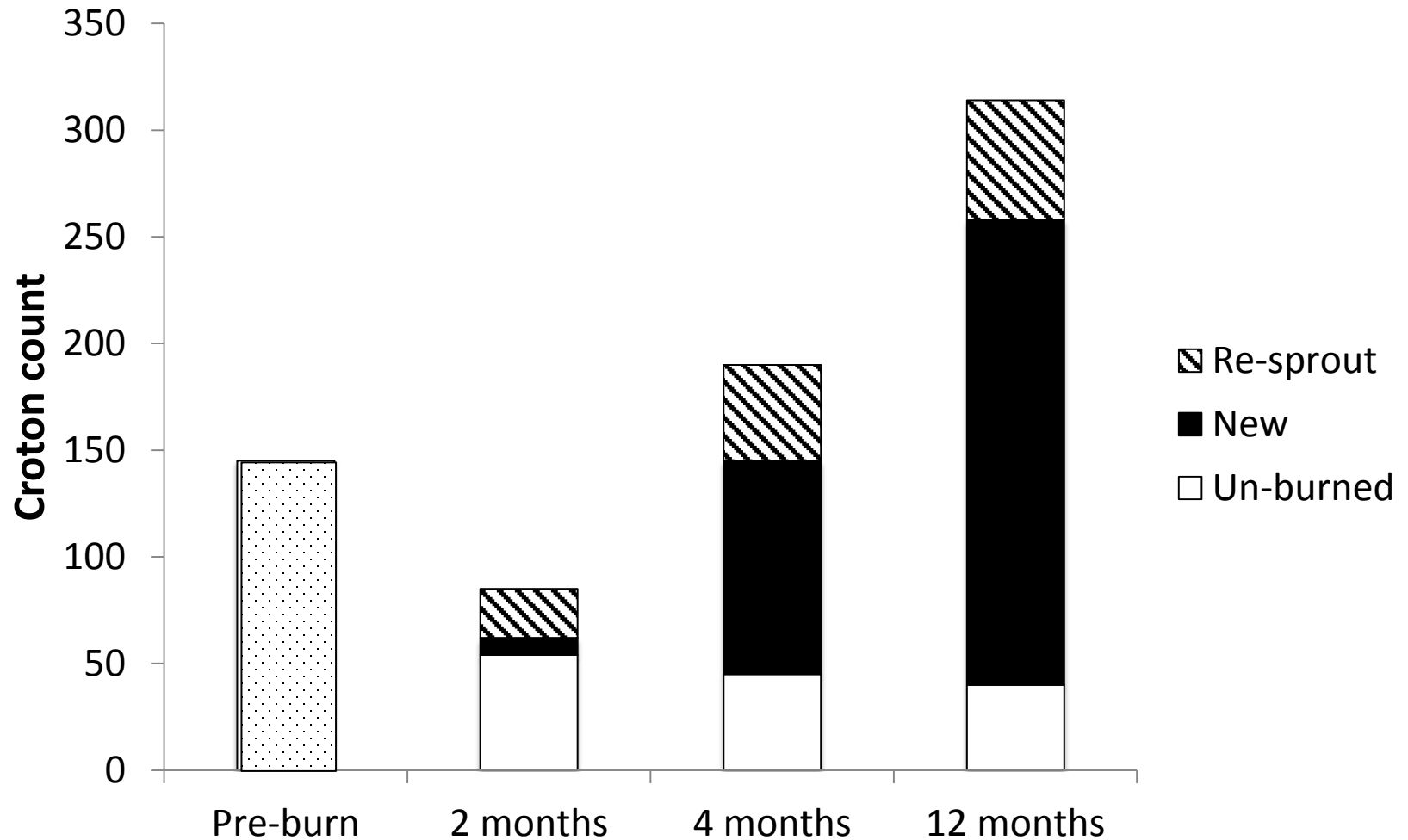
Habitat Degradation

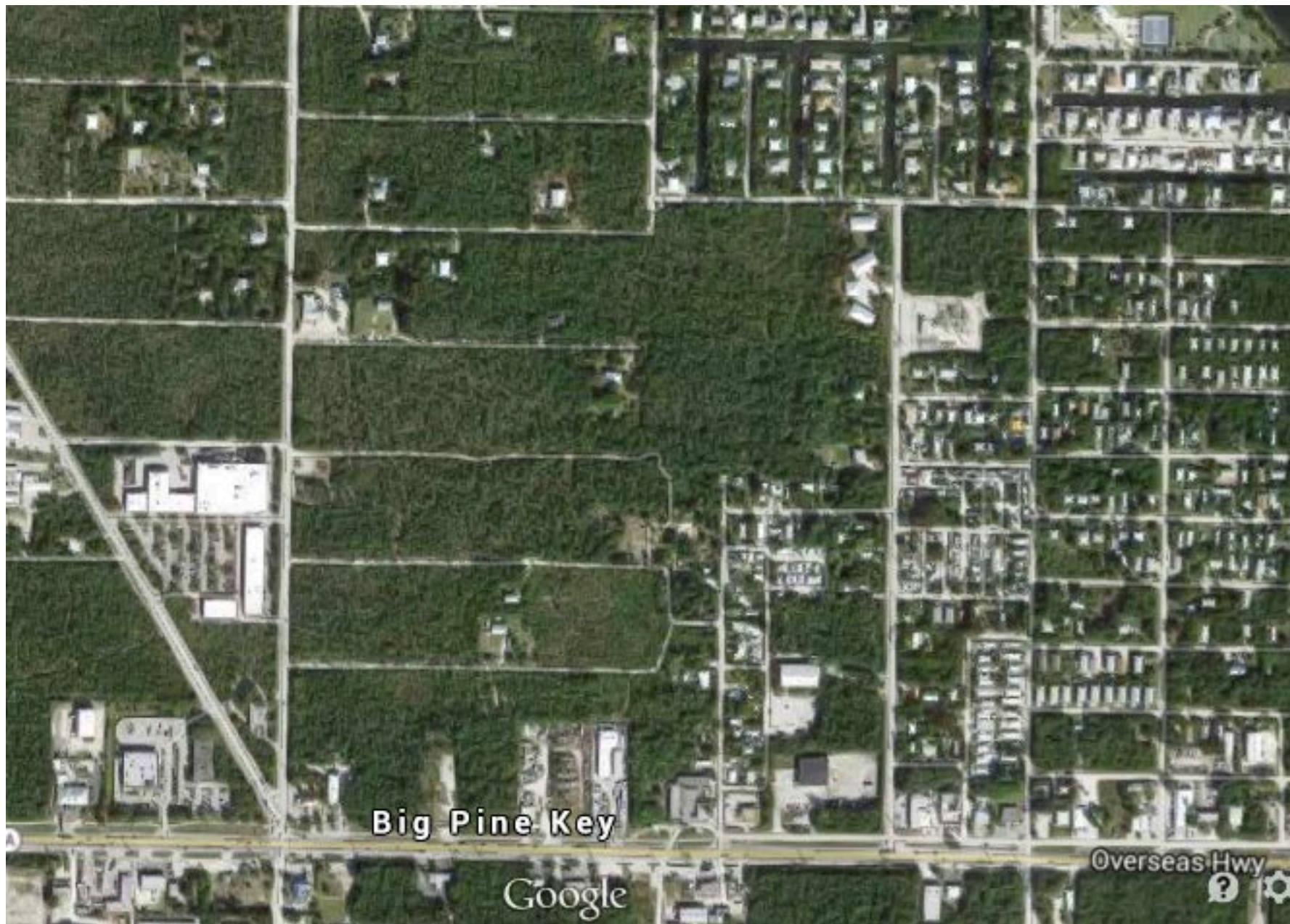


Less disturbance = less croton



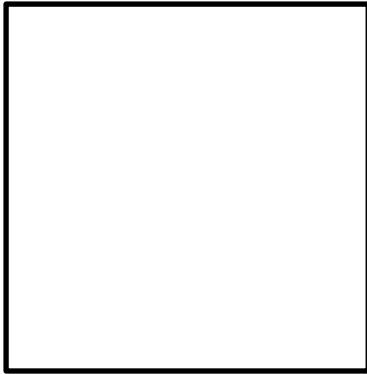
Croton likes fire!





Experimental restoration

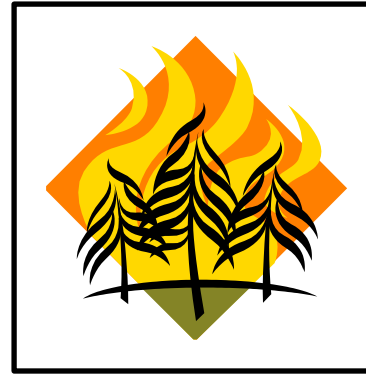
Control



Mechanical



Fire



Mechanical + Fire



Experimental restoration



How does disturbance affect croton populations?



How does disturbance affect croton populations?



How doe



croton



How does disturbance treatment affect predator abundance and behavior?

- Ants



- Anoles



LOTS of butterflies NEED disturbance



Large blue and grazing



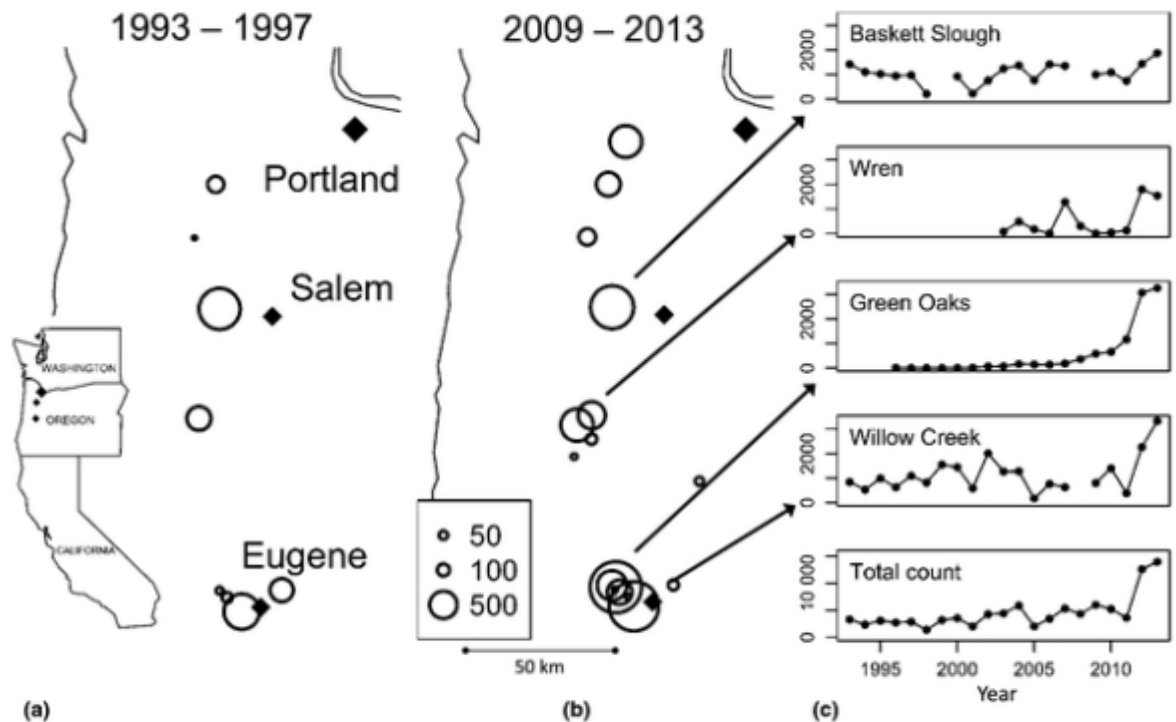
Fender's blue and fire



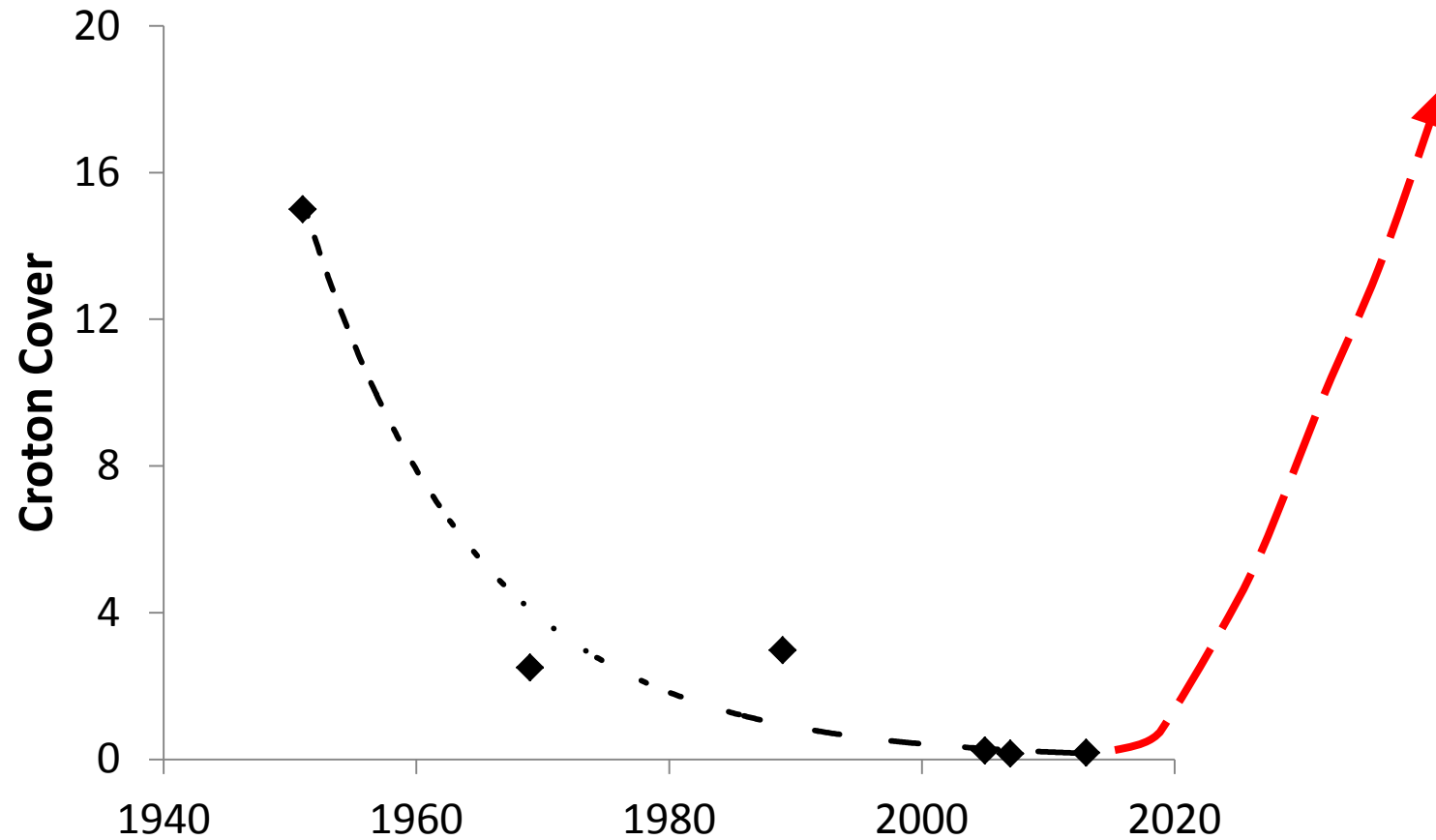
St. Francis' satyr and beavers



Fender's blue and fire

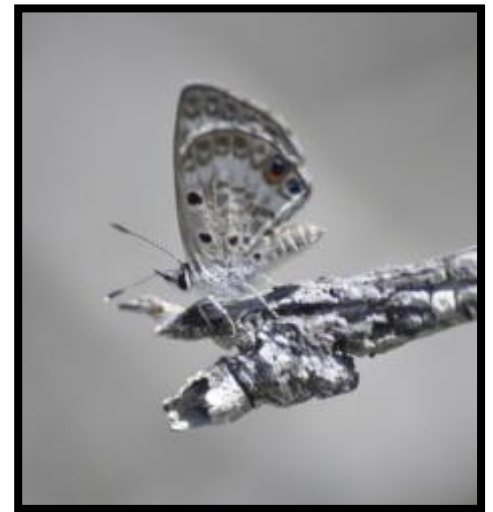


Bartram's and fire and/or mechanical??



Thanks!

- Nick Haddad – NC State
- Bill Morris – Duke
- Jaret Daniels – U. of Florida
- US Fish and Wildlife Service
 - Chad Anderson, Kate Watts, Chris Eggleston, Nancy Finley, Steve Nelms, and countless FL Keys Refuge Interns!



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SE CLIMATE SCIENCE CENTER

