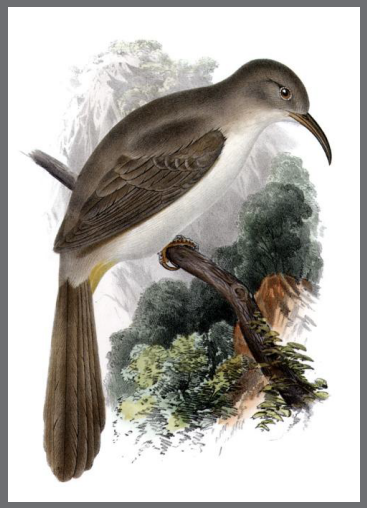
Le Conte's Thrashers

Guiding conservation in the Carrizo Plains

Leo Salas, Dennis Jongsomjit, Jim Tietz, Geoffrey Geupel



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Acknowledgments

Bureau of Land Management

MidAmerican Solar

Board and members of
Point Blue conservation Science

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Overview

- About Point Blue
- About LCTH – why it matters?
- Project History – understanding LCTH needs
  - What we did and how we did it
- Results
- Conservation management implications
- Next steps

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Point Blue Conservation Science

Reducing the impacts of habitat loss, climate change, and other environmental threats while promoting nature-based solutions for wildlife and people.

- Founded in 1965 as Point Reyes Bird Observatory
- 150 seasonal and full time staff
- Advancing conservation through science, partnerships, outreach
- Work throughout the US, Latin America, Antarctica
- Promote climate-smart conservation

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About the LeConte's Thrasher

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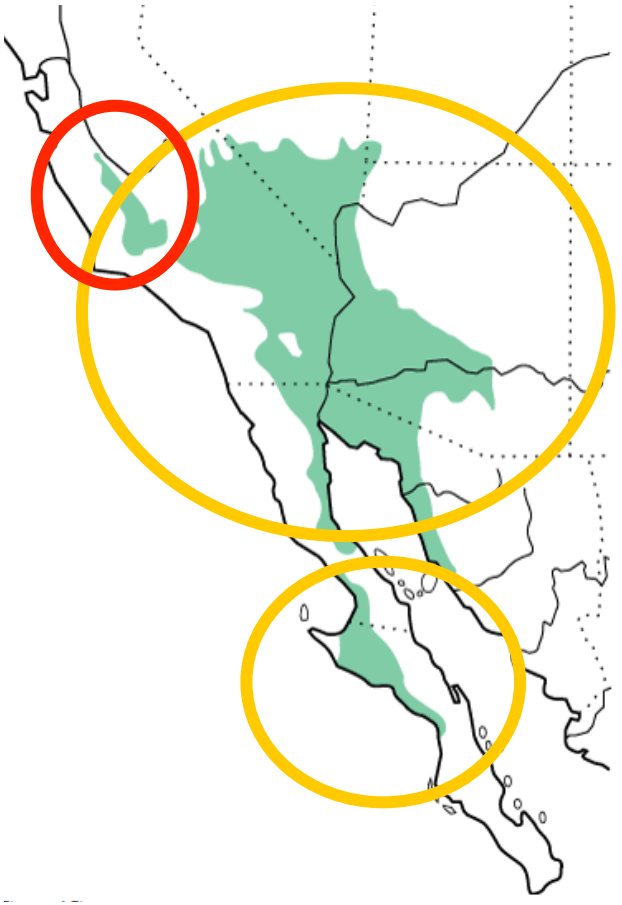
Distribution: *Toxostoma lecontei*

Uncommon resident of the southwestern deserts

2-3 subspecies

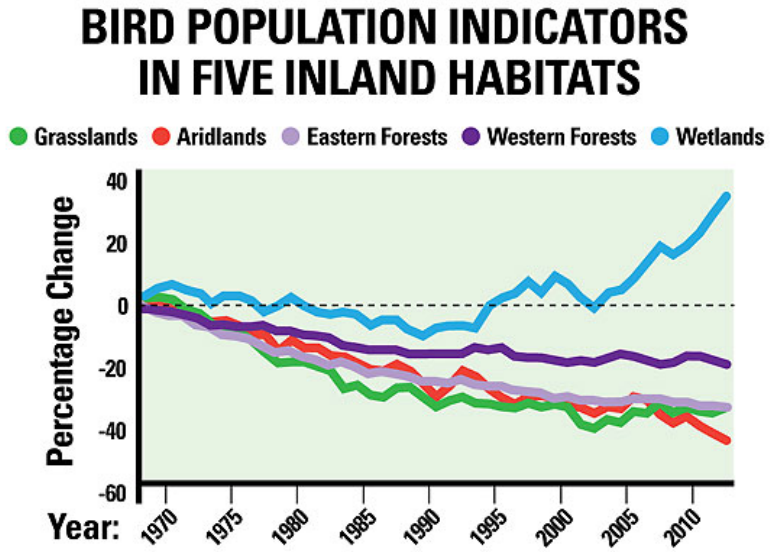
- *T.l. lecontei*
- *T.l. arenicola*
- *T.l. macmillanorum*



From The Birds of North America Online

State of the Birds Report

- Le Conte's Thrasher is an indicator species of aridlands in the western US
- It is the fastest declining species among 17 aridland obligate indicators
- Why:
  - Habitat loss & fragmentation
  - Energy development
  - Long-term habitat degradation (e.g. non-native plants)
  - Climate change



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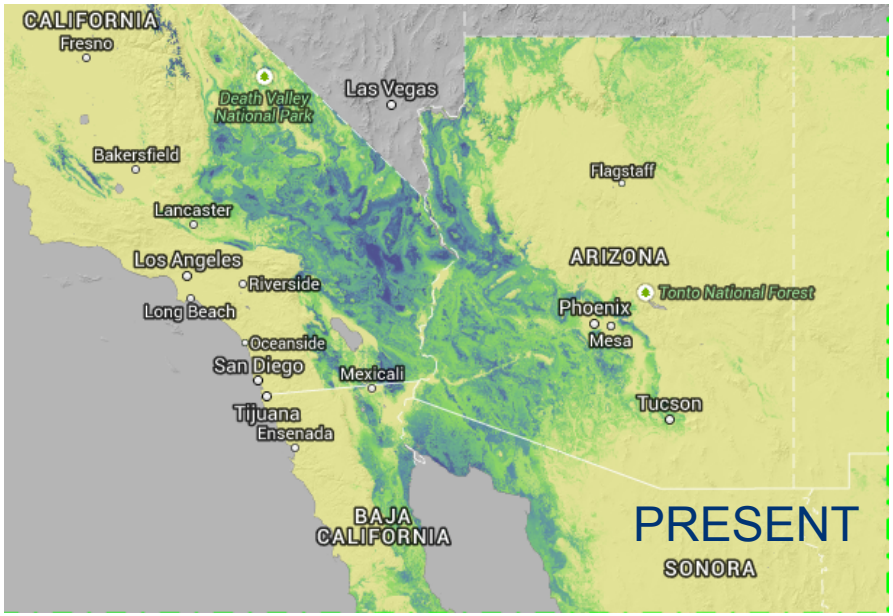
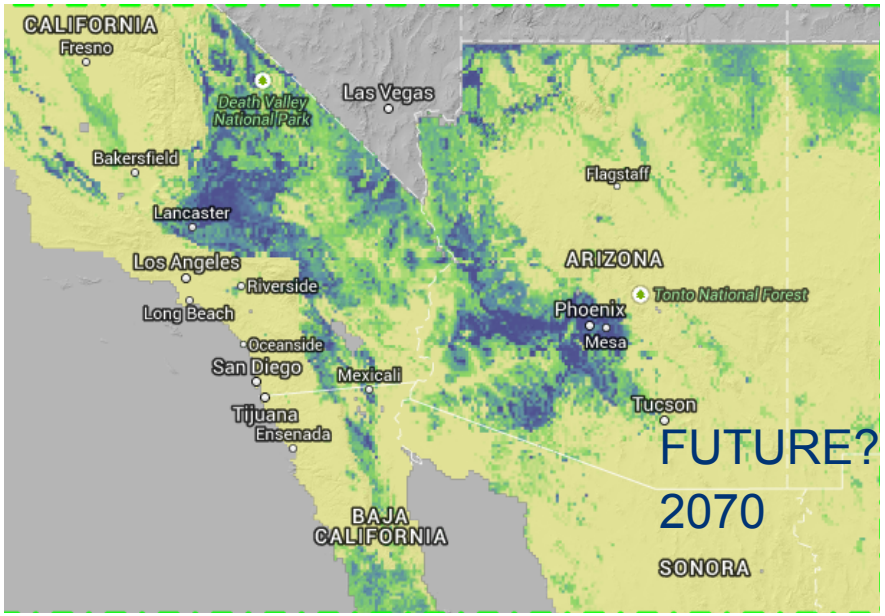
Projections into the future (http://data.prbo.org/apps/sjv/)

- The Carrizo Plain may be a climate refuge
- LCTH is projected to persist in the Carrizo Plain





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Conservation Challenges in CA

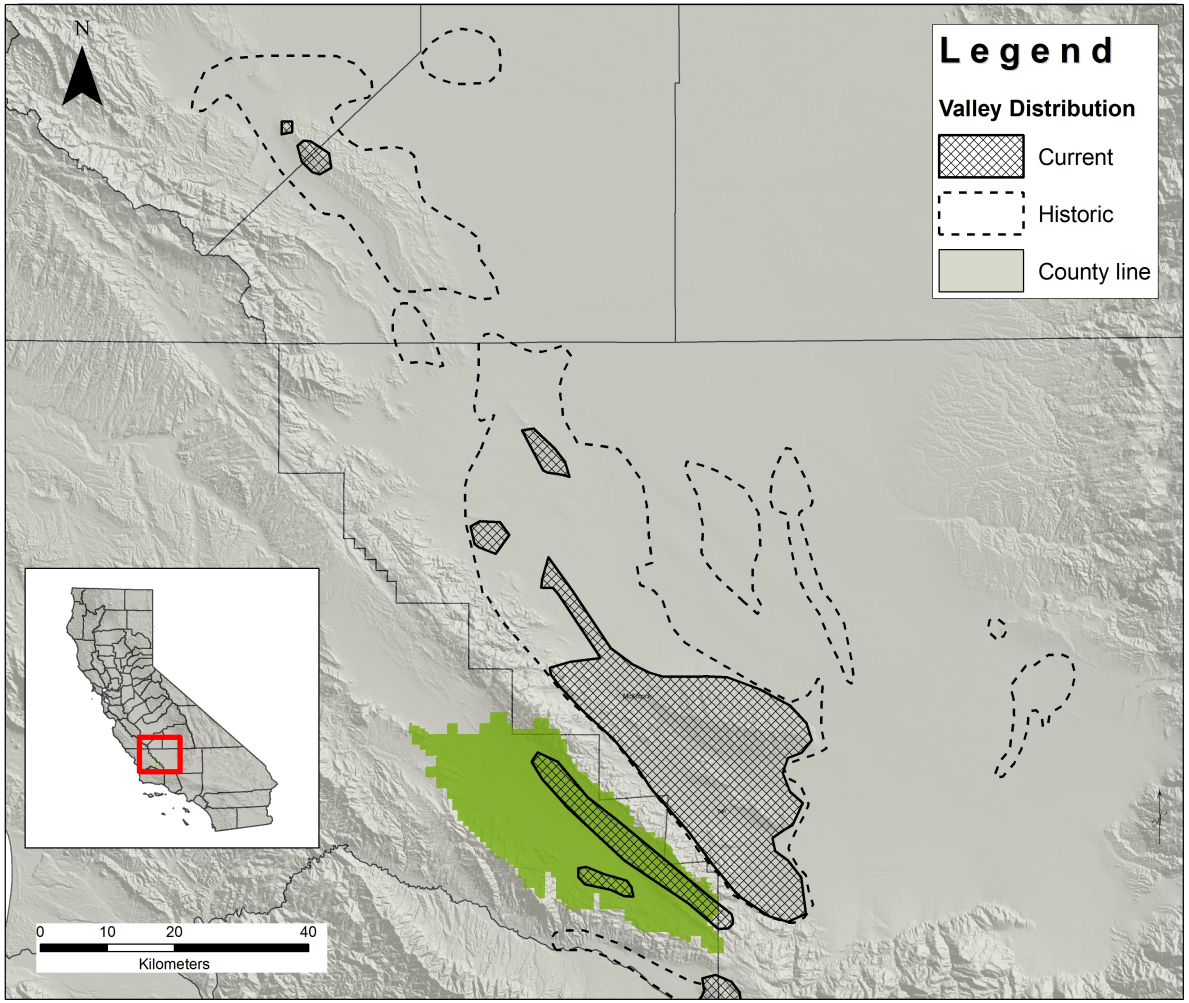
Identified as a Bird Species of Special Concern (CDFW):

- Habitat loss and degradation
- Low population density (i.e. high sensitivity to disturbance)
- Habitat needs poorly understood (little research done)

Distribution: *Toxostoma lecontei*

- *T.l. macmillanorum*

The Monument is one of the largest intact parcels of habitat in the current range



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Le Conte's Habitat Needs
what we know

Prefers desert flats with saltbush (Atriplex spp) or cholla cactus (Opuntia spp.)

Low topo relief, open habitat and mid-height shrubs for nesting

Feeds on arthropods on open ground, under leaf litter and shrubs

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Project history and overview

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Project History

- Funded in 2010 via NLCS grant.
    - First monitoring design, habitat model
- Monitoring methods refined in 2011
- Final area search plots established in 2012
- Surveys continued in 2013
- Small grant to improve models in 2014
- Monitoring for 2015 funded by MidAmerican Solar and the Bureau of Land Management

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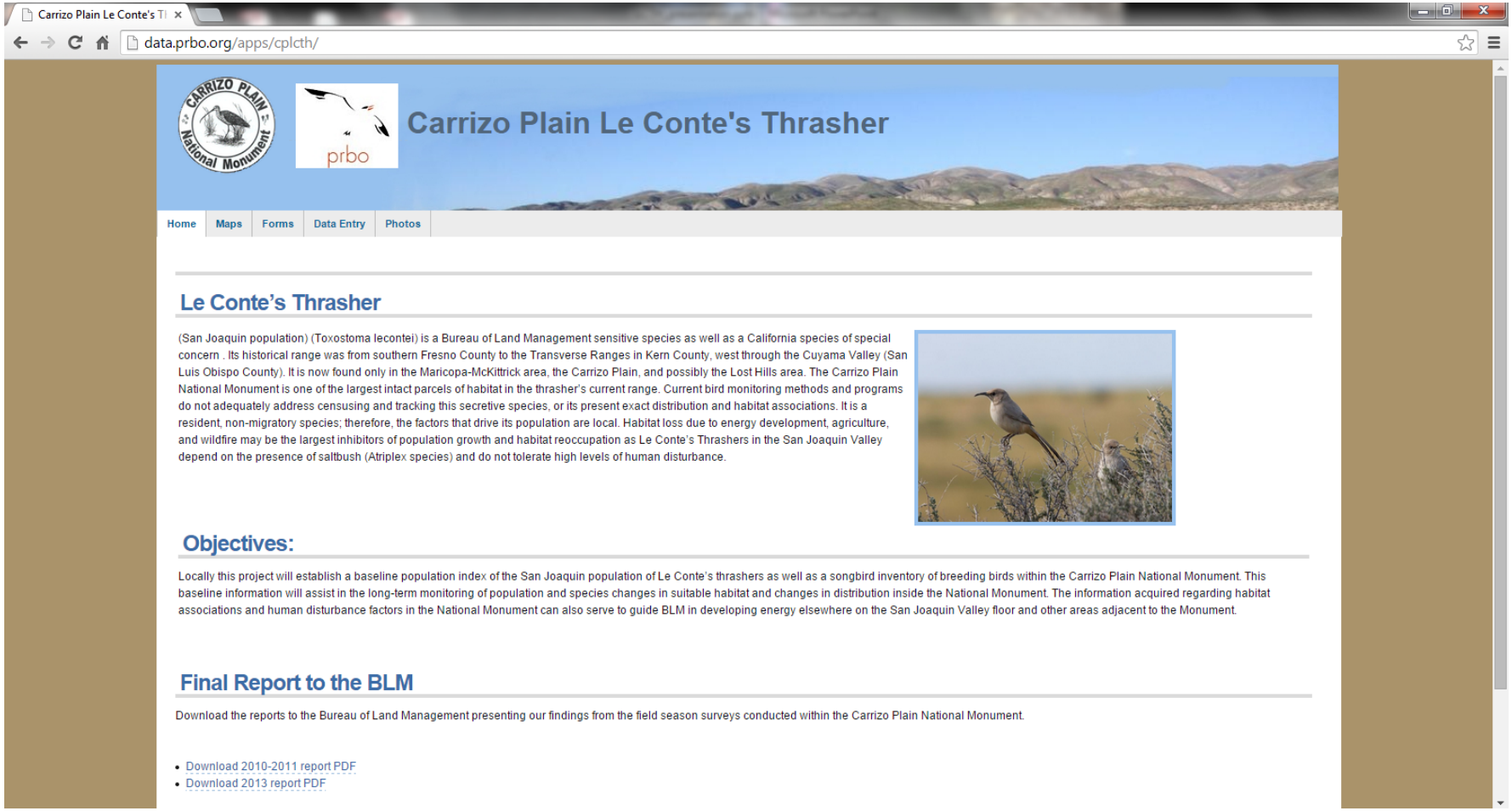
On-line app

http://data.prbo.org/apps/cplcth/



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Project's current objectives

- Understand LCTH habitat needs and guide management
- Understand LCTH density distribution in the landscape
- Identify priority areas for conservation of LCTH populations in the Central Valley
- Provide density targets in the Carrizo Plain


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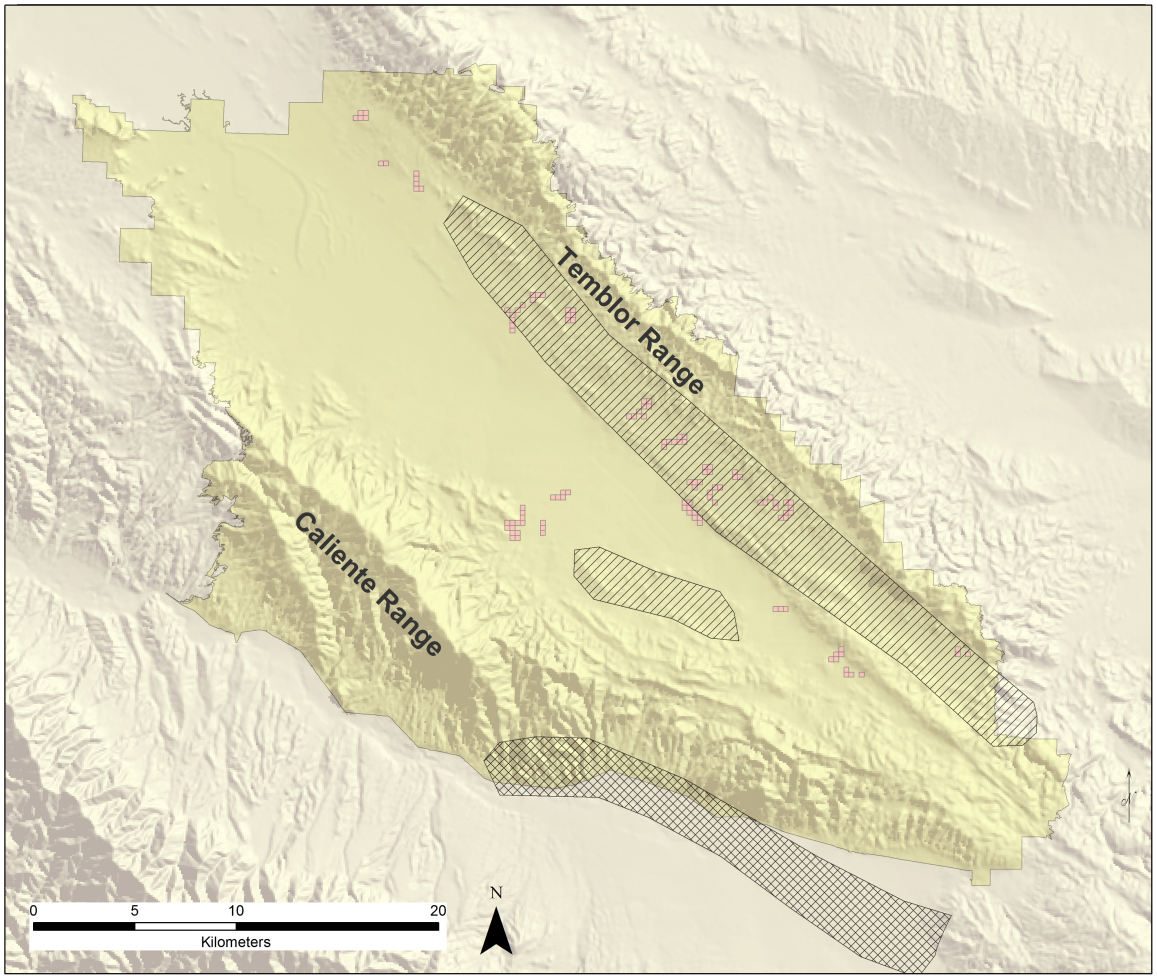
Study Area – Survey Plots



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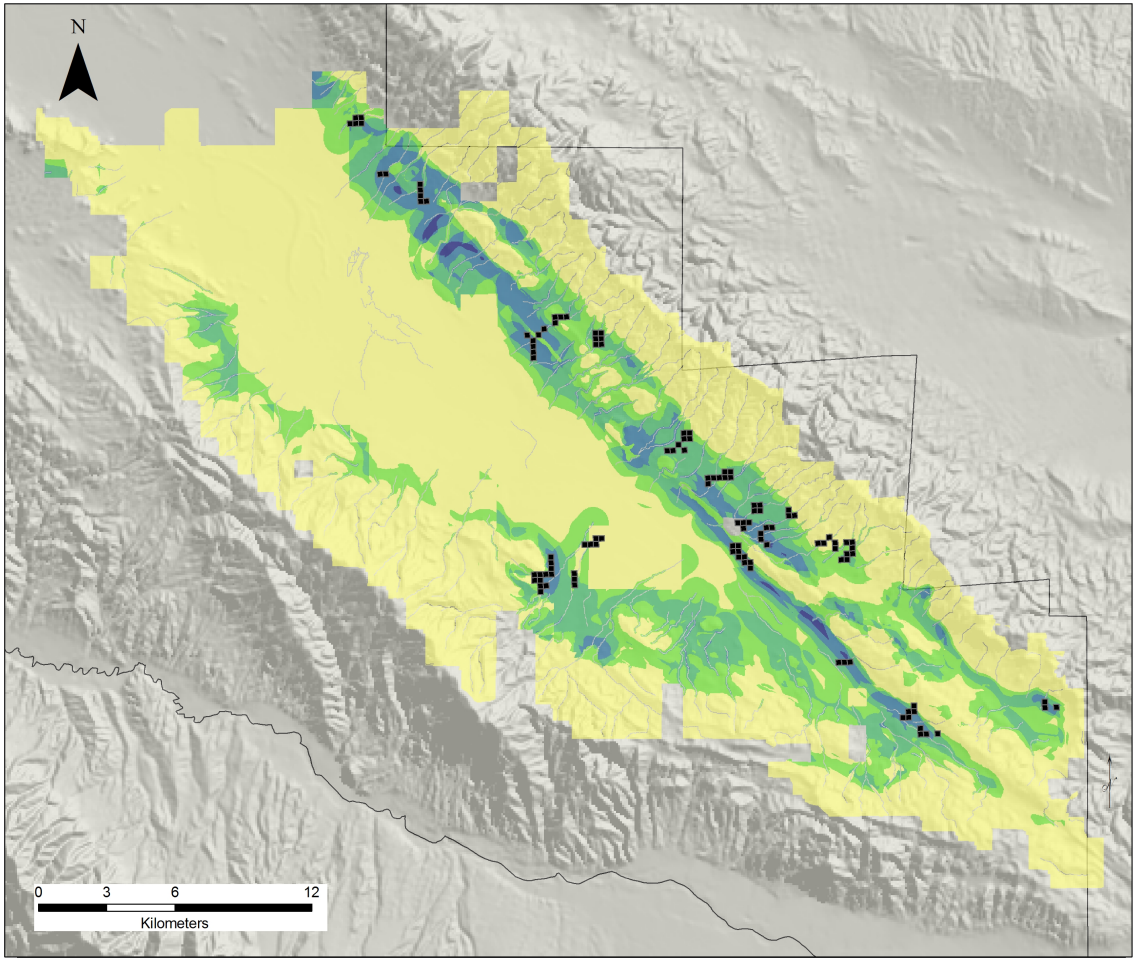
Plot Selection

Plots established based on the habitat model, vegetation maps, and historic sightings

Plots are 250m^2 – approx. size of a LCTH territory

117 plots established

Each plot sampled 1 to 3 times per year



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Vegetation Relevés

- Focused on dominant plant types thought to be important for thrashers
  - Saltbush types
  - Other shrubs
- Height and cover
- Ground cover (grass, open ground)
- Slope and aspect

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Leo's disclaimer

Never been to the Carrizo Plain

Never seen a LCTH

But there is a reason….

…how do you say "go to hell!" in Venezuela?

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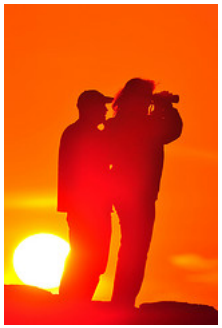
Imperfect-detection model
Why and how

- Rare/difficult to find species = surveys with low counts (many 0's too). What is the true density?
- Repeated counts example

Visit 1 | Visit 2 | Visit 3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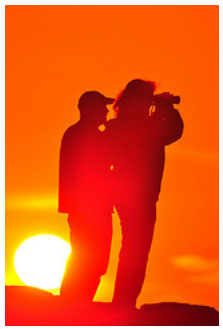
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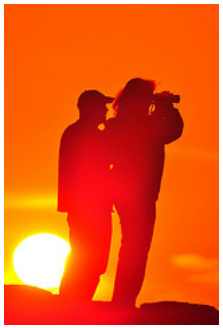
= ?

At least 2 birds, but surely more

0 birds | 2 birds | 0 birds

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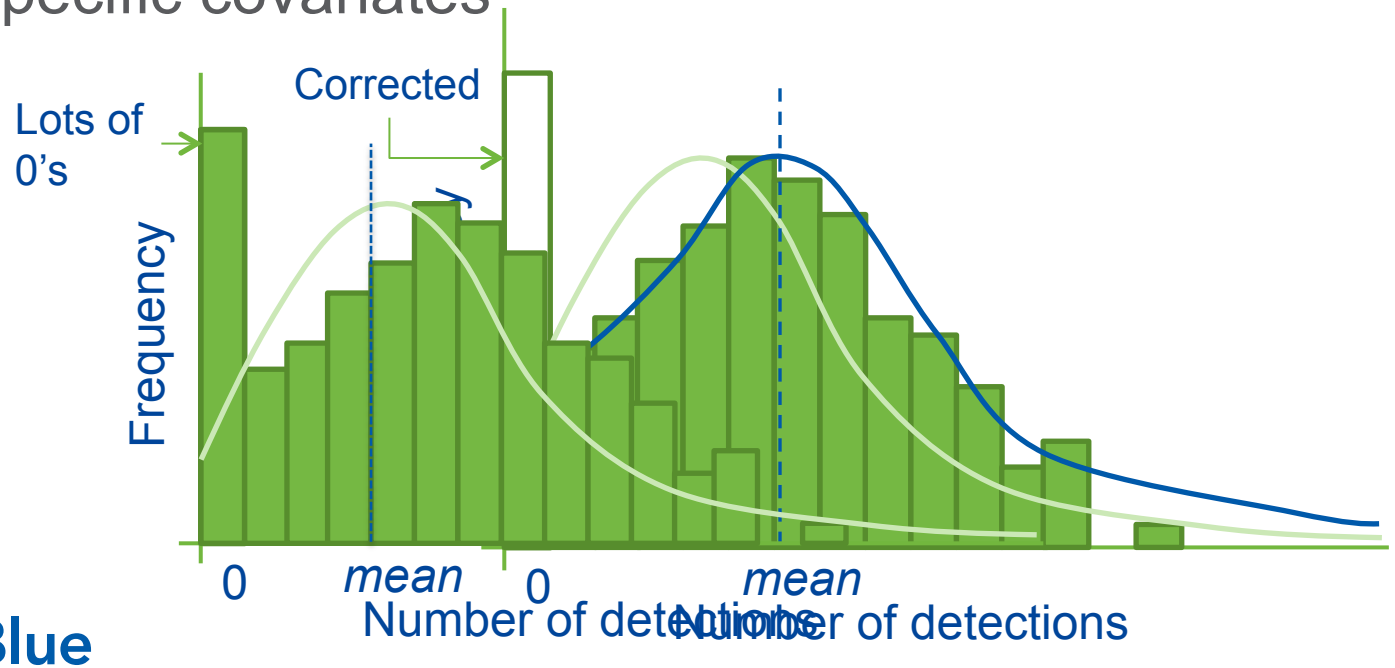
Imperfect-detection model
Why and how

- Probability of detecting each bird each visit << 1
- Estimates must correct for imperfect detection
- Imperfect detection models use repeated count data, site-specific covariates



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From density estimates to landscape model

- Landscape-level factors affect distribution and abundance in the landscape
- Use geospatial covariates (e.g. veg cover layers) + density estimates across landscape
- Machine-learning models as landscape models (trade bias over variance to predict exceptionally accurately)

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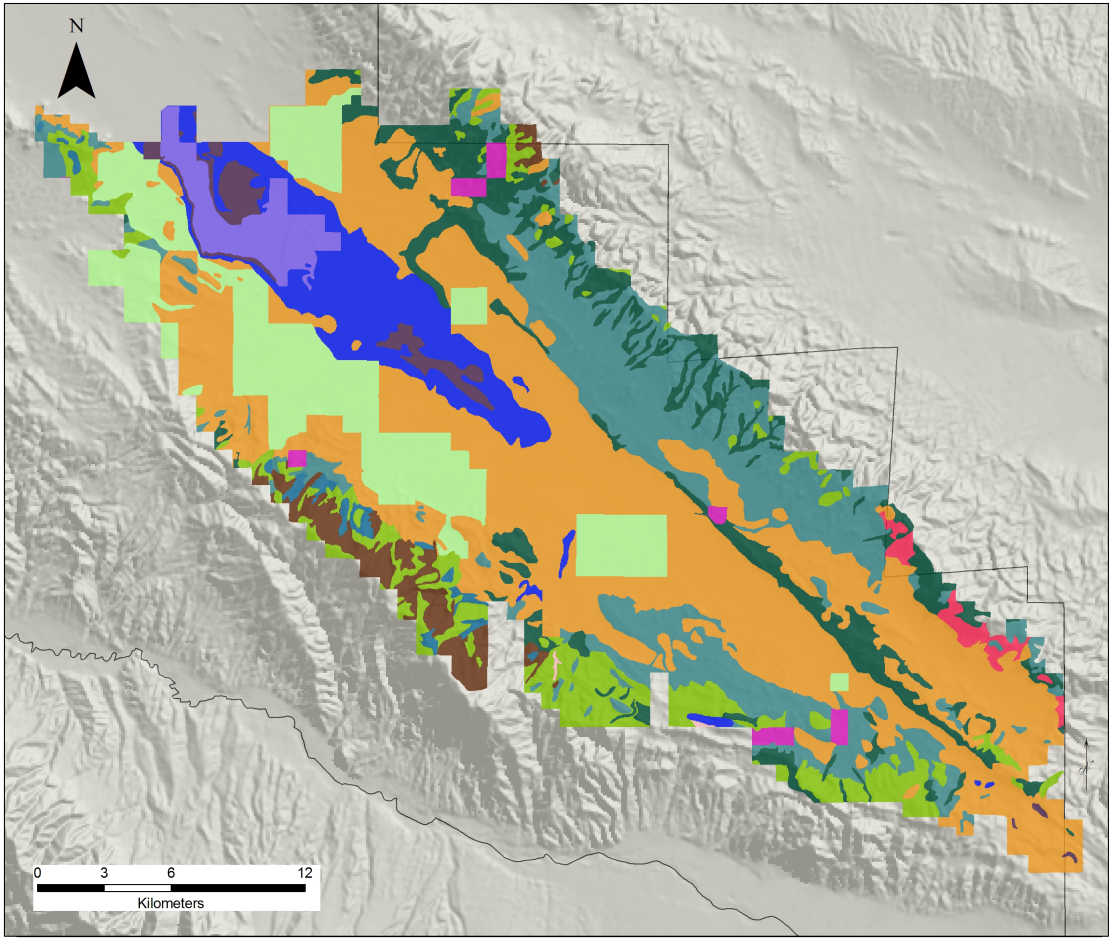
Vegetation Type – Old Data Layer

- Relatively low resolution
- Broad vegetation classes



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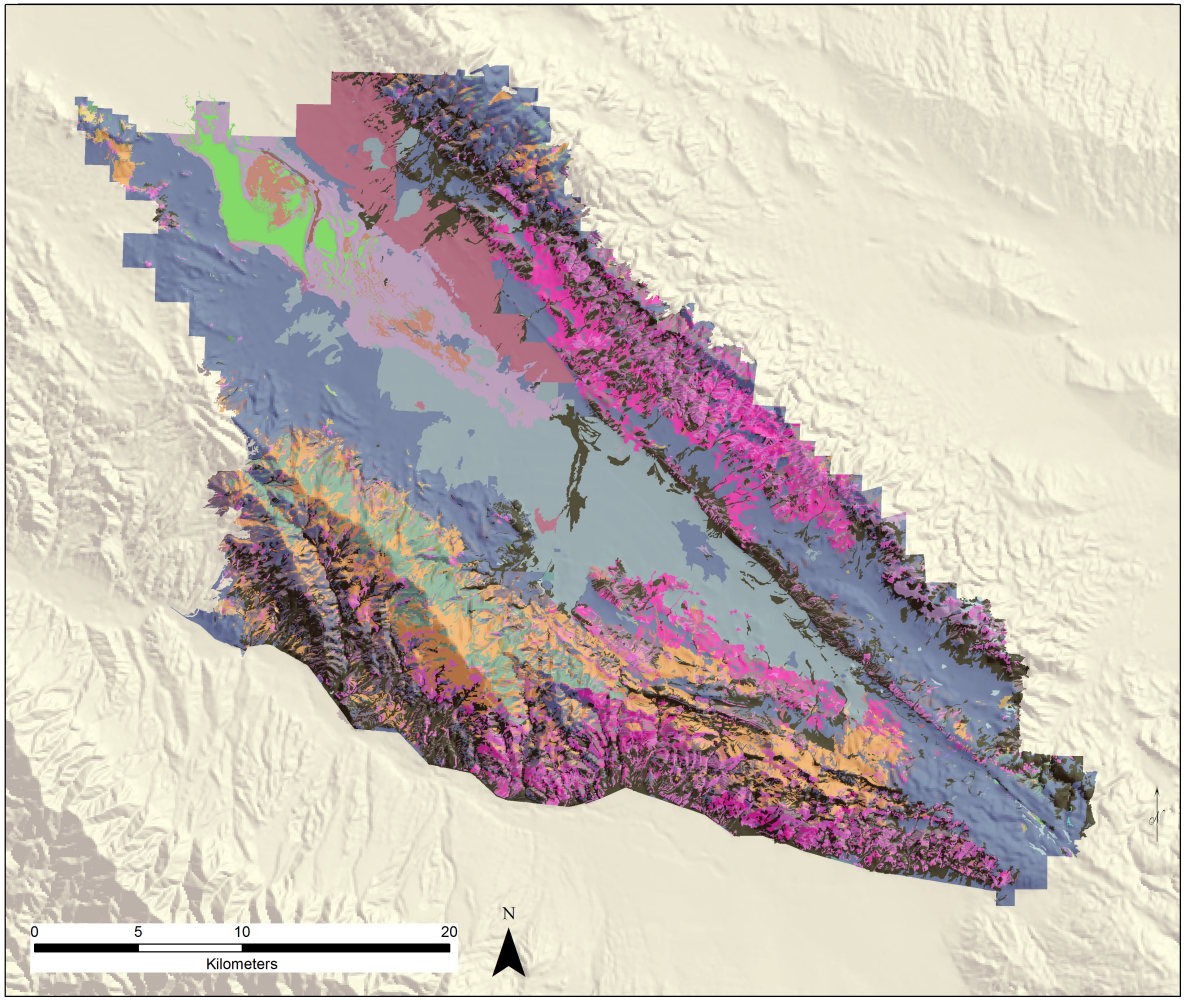
New Vegetation Layer

- NEW! California Native Plant Society layer
- High resolution
- Precise vegetation classes
- Ground cover, shrub cover



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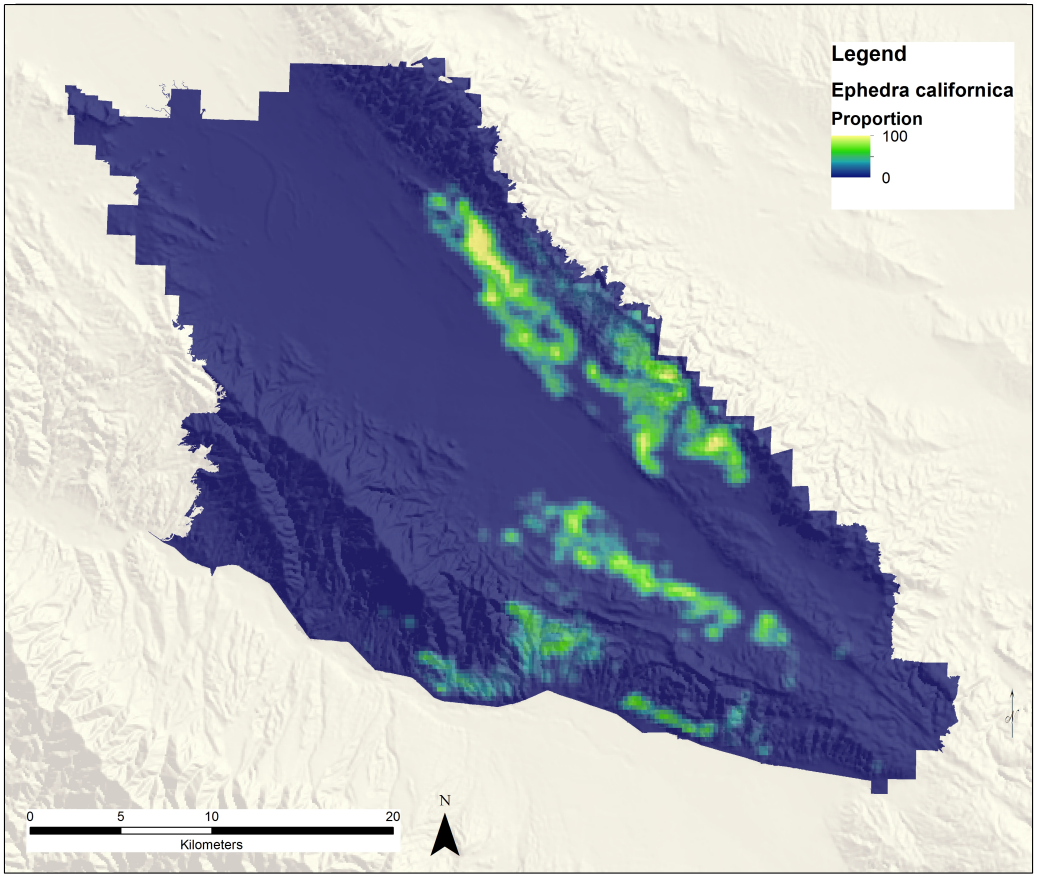
Covariate: Proportion Ephedra californica

- Important veg class
- From CNPS layer!



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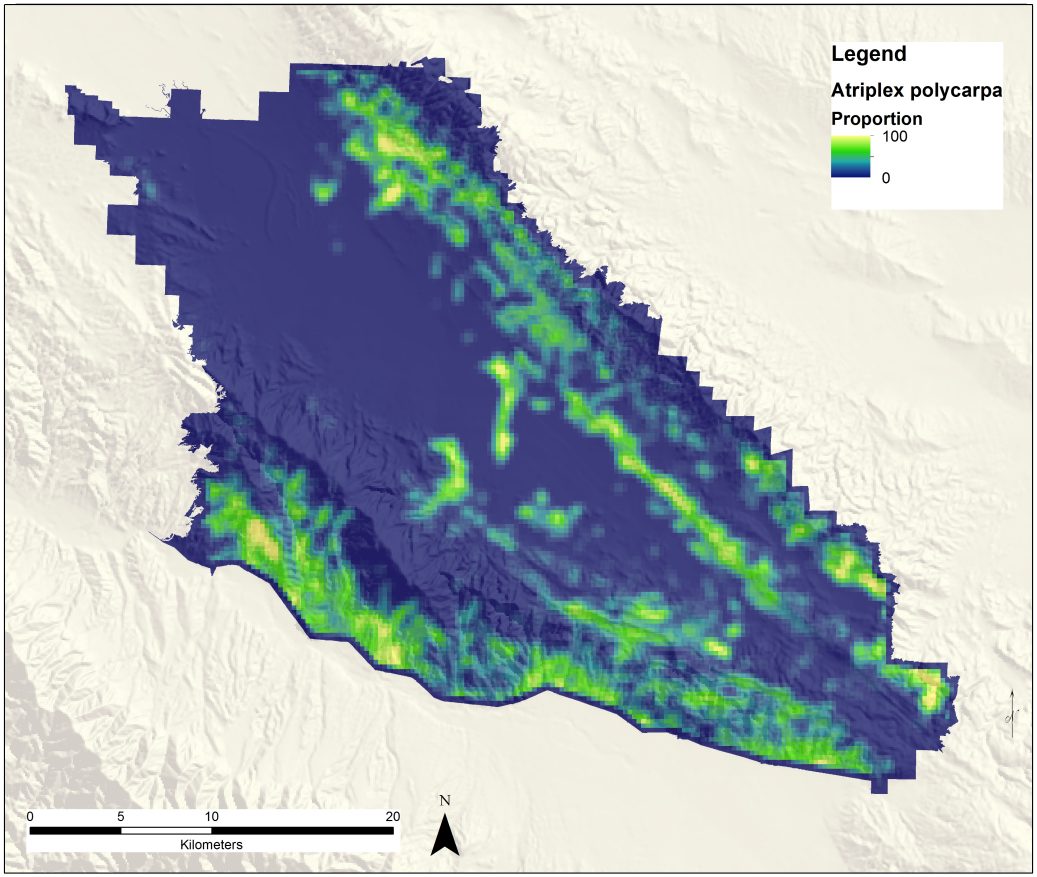
Covariate: Proportion Atriplex polycarpa

- Important veg class
- From CNPS layer!



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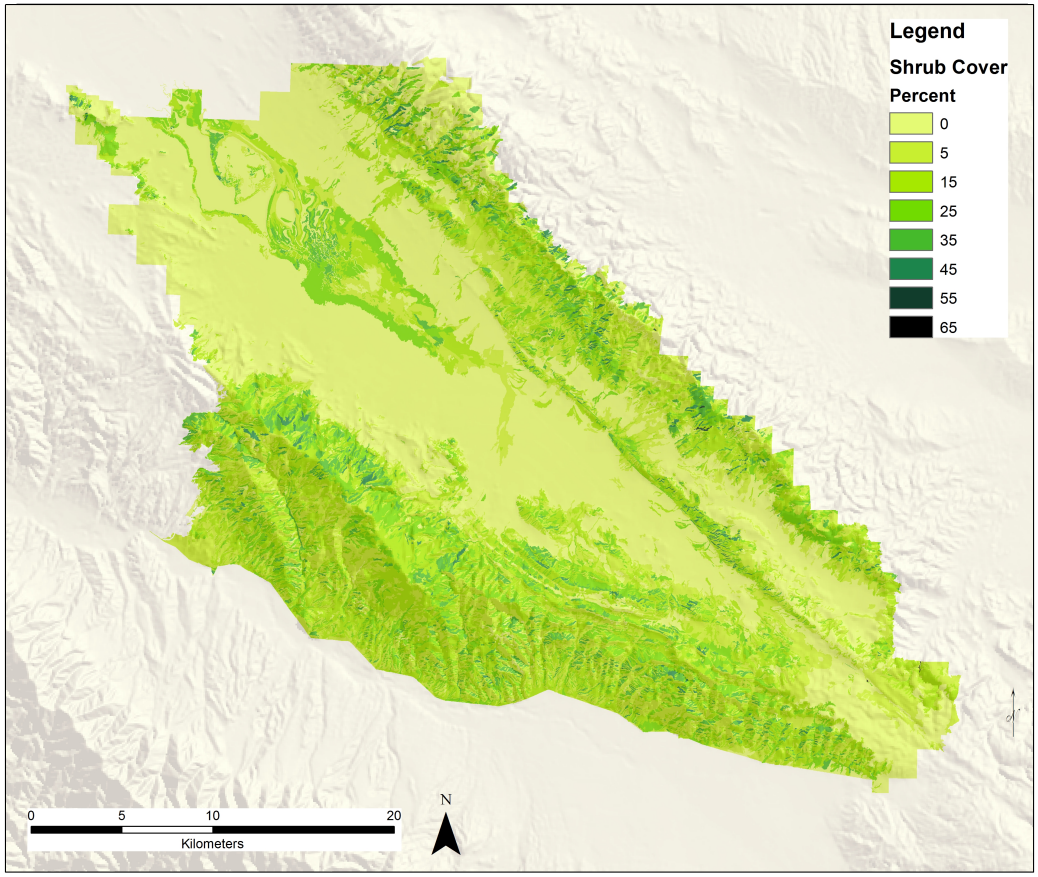
Covariate: Percent Shrub Cover

- Important veg class
- From CNPS layer!



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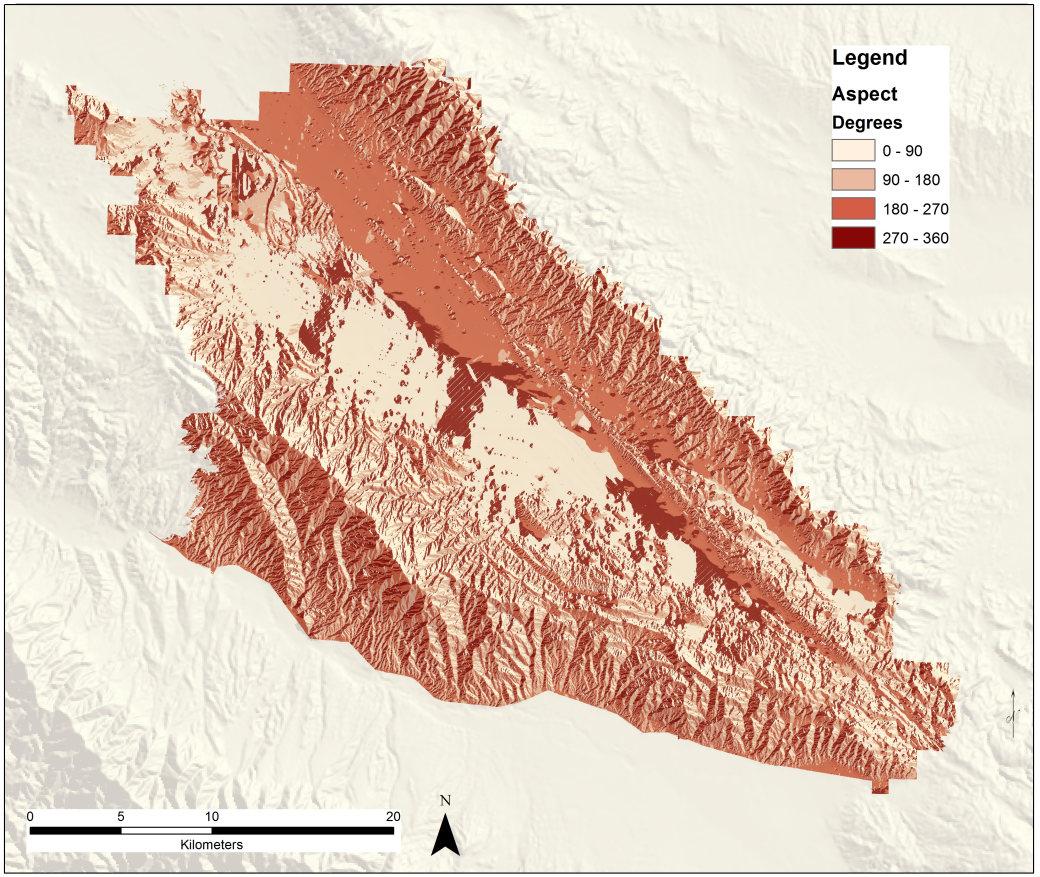
Covariate: Aspect

- Additional covariate
- Others: slope, distance to wash



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Project results

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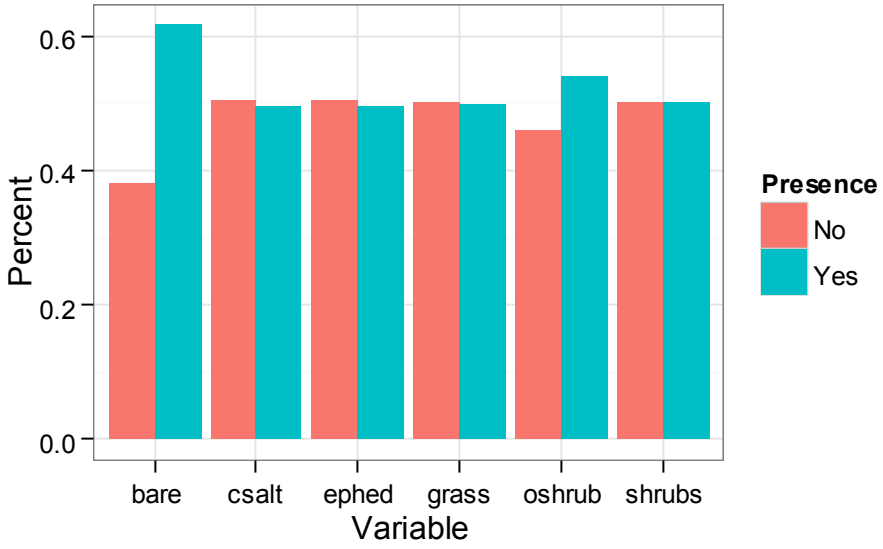
Data summary

- 152 plots over 4 years
- 67 detections in 41 plots
- Complex, subtle differences between sites with and without LCTH



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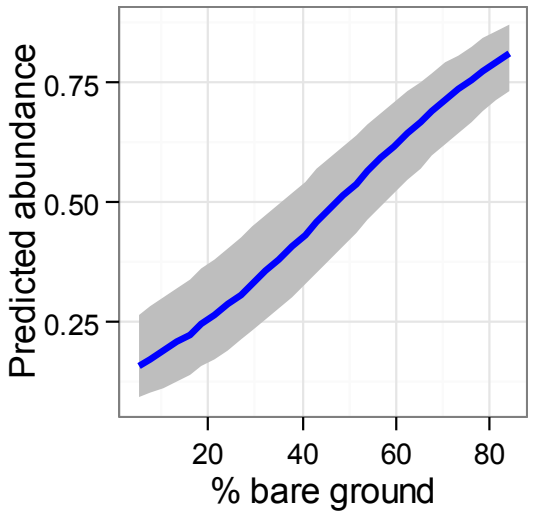
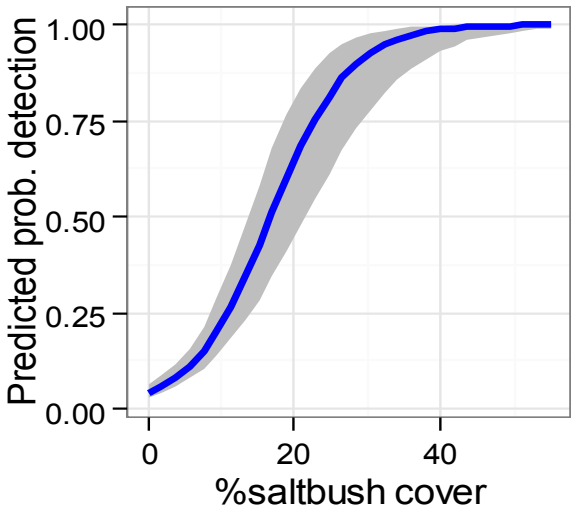
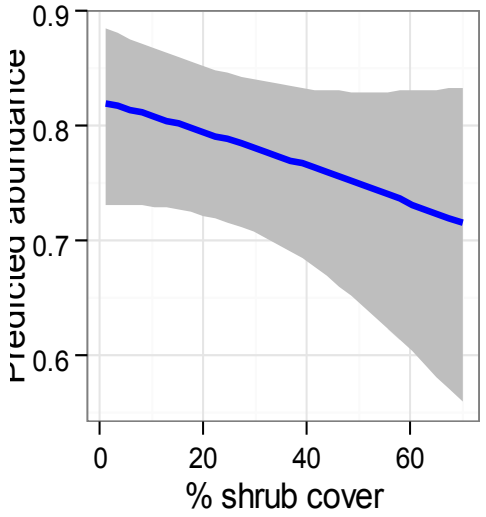
Density model results







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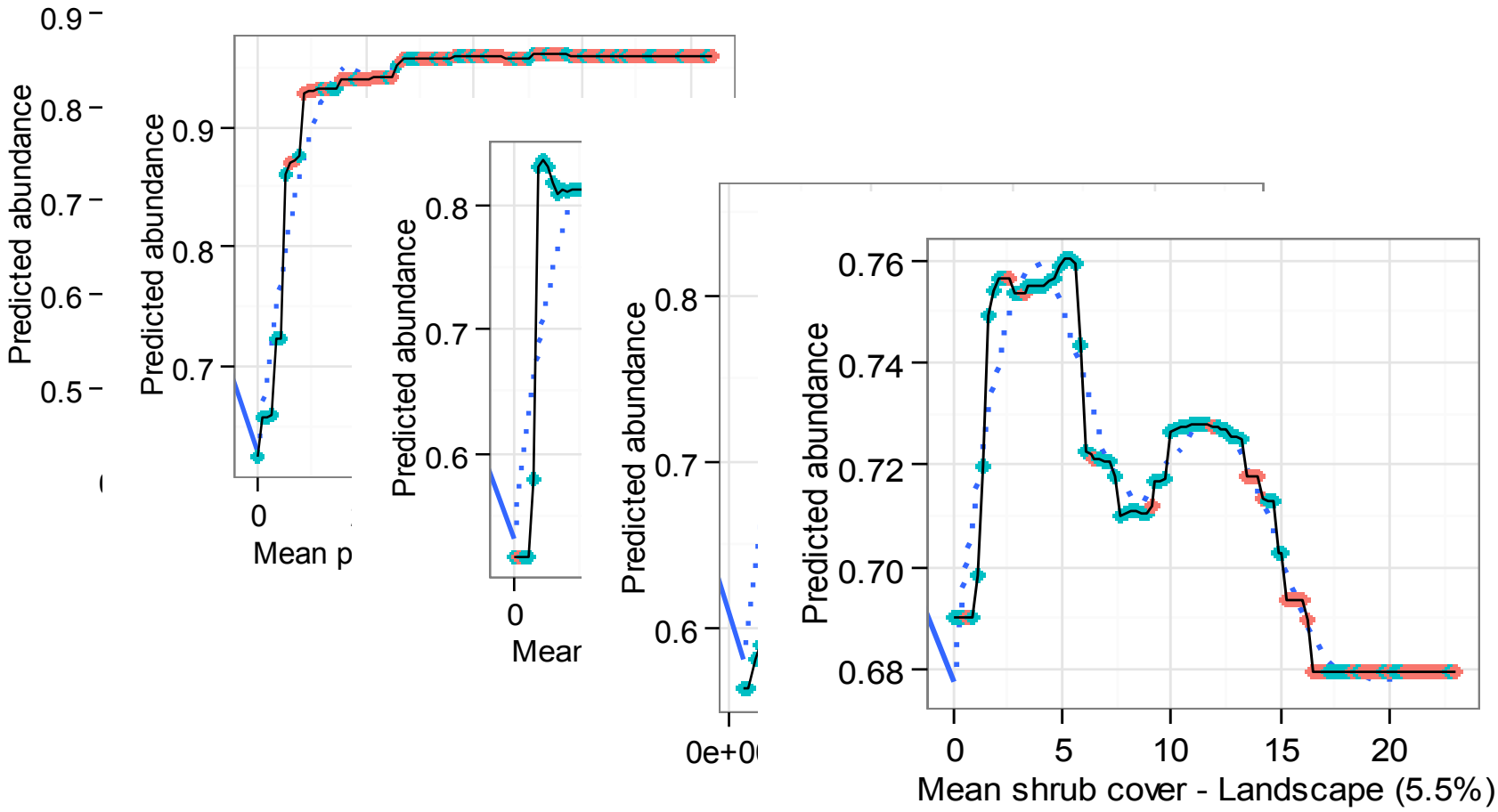
Landscape model results



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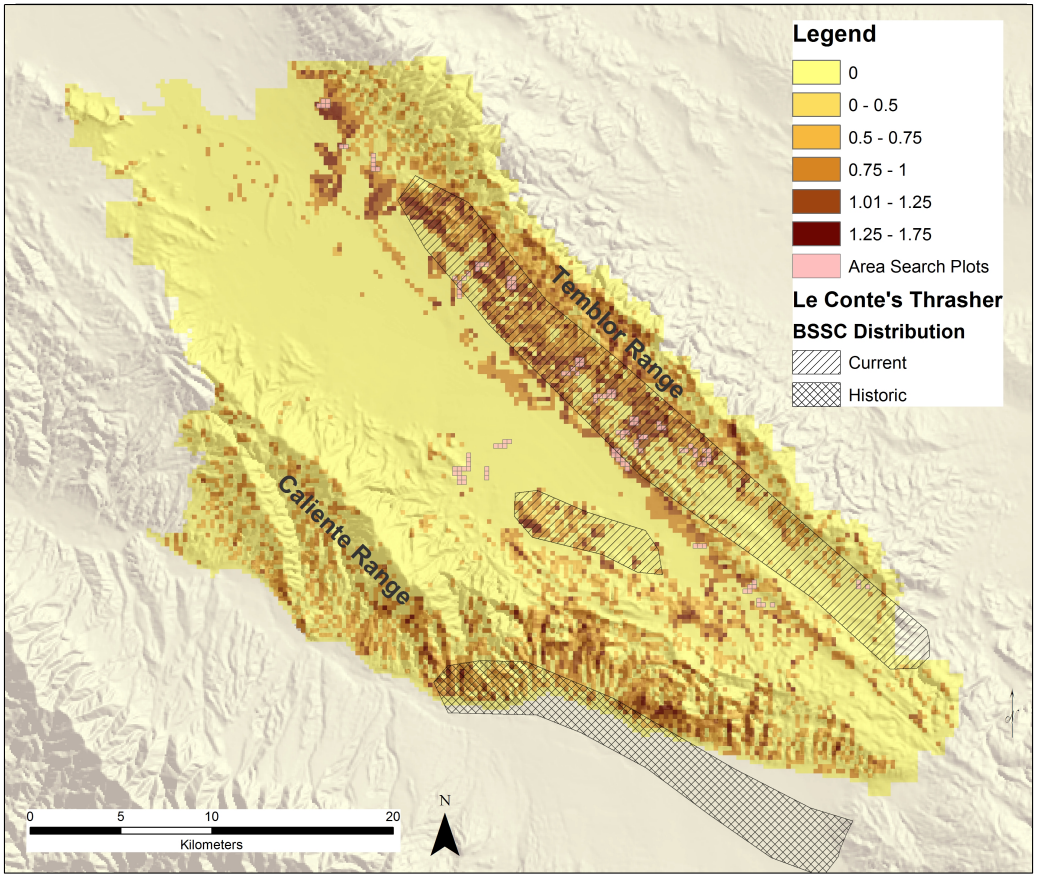
Results – landscape model

Where?

Model predicts density in all locations

Set threshold for 0 abundance (< 2 pairs/km2), conservative



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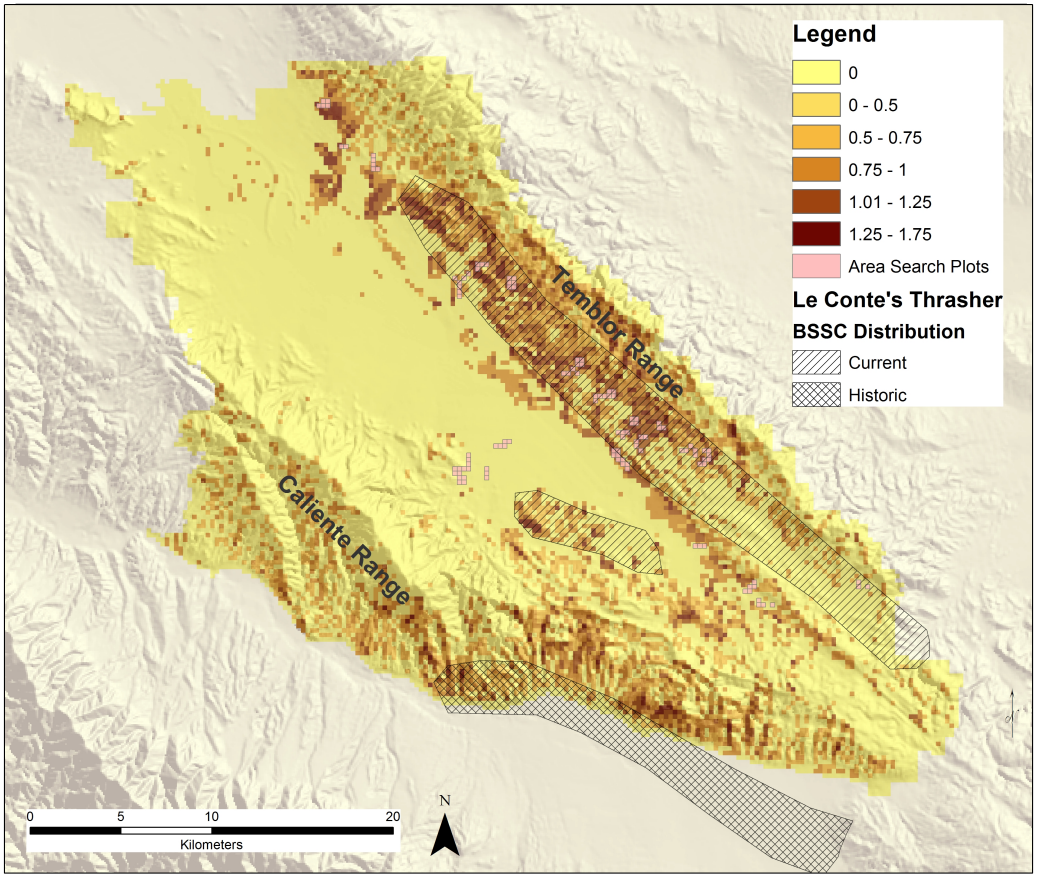
Results – landscape model
How many LCTH?

High LCTH density locations are independent of threshold

How many LCTH? Threshold dependent (BIG caveat)



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Management recommendations

- Target priority areas for conservation based on high density models (improvement over occupancy models)
- Manage for LCTH-friendly habitat (features identified in this project):
  - % ground cover (~80%?)
  - % shrub cover in general (~10-20%)
  - % saltbush cover (part of the shrub cover

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Management recommendations

- Manage areas with 0.5-1 bird/hectare to target >1 bird/hectare
- Validate the model: survey predicted new high-density areas
- Use model results to conserve areas outside the CPNM
- Improve area search survey to estimate trends and set management targets based on trends

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Next steps

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Improving model

- Survey (again) fully randomized wrt relevant density, detection covariates
- Survey fully randomized wrt relevant landscape-level covariates
- Evaluate models at different plot sizes

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THANK YOU!

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Color Palette Reference Guide

Please use this page as a visual reference only for choosing colors from your custom color palette. This page is not editable.

Primary Palette

Bright Blue | Green | Dark Blue

Bright Blue, Green, and Dark Blue are the primary colors and take priority over the secondary palette.

Secondary Palette

Lichen | Poppy | Light Grey | Dark Grey

Lichen, Poppy, Light Grey, and Dark Grey are used minimally and when you need more colors than the Blues and Green.

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