Le Conte’s Thrasher Monitoring and Conservation on the Carrizo Plain

Dennis Jongsomjit, Geoffrey Geupel and Jim Tietz

Point Blue
Conservation science for a healthy planet.

November 8, 2013
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
- 140 seasonal and full time staff
- 2013 budget: $9.7 million
- Advancing conservation through science, partnerships, outreach
Point Blue

Originally PRBO Conservation Science, founding member of the AKN
Content

Part 1 – Conservation needs of the Le Conte’s Thrasher

Part 2 – Project history, goals and objectives

Part 3 – Development of monitoring methods

Part 4 – Results, habitat models, and next steps
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Le Conte’s Habitat Needs

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

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

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

*Fitton, Shuford and Gardali (eds) 2008*
Distribution: *Toxostoma lecontei*

Uncommon resident of the southwestern deserts

2-3 subspecies
- *T.l. macmillanorum*?
- *T.l. lecontei*
- *T.l. arenicola*

From The Birds of North America Online
Distribution: *Toxostoma lecontei*

- *T.l. macmillanorum*

The Monument is one of the largest intact patches of habitat in the current range.
Conservation Challenges

Identified as a Bird Species of Special Concern by CA Dept of Fish and Wildlife

- Habitat loss and degradation
- High intensity fire – type conversion
- Grazing impacts
- Climate change – drought
Conservation Challenges

No systematic effort to track populations (surveillance monitoring)

Existing monitoring programs not sufficient for its patchy distribution and early breeding (eBird, BBS, CBC)

Lacking information to guide and target restoration (effectiveness monitoring).

Little information on population
Content

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Project History

• Funded in 2010 BLM NLCS grant. Initial habitat model and monitoring plots developed

• Monitoring methods and habitat model were tested and refined in 2011

• Final area search plots established in 2012

• Surveys continued in 2013
Project Objectives

• Collect baseline population data of the San Joaquin population of Le Conte’s Thrasher and inventory breeding songbird.

• Describe and refine knowledge of spatial distribution and habitat associations of Le Conte’s throughout the Monument.

• Develop and test appropriate cost effective monitoring protocols

• Develop an online data-entry site to allow for the systematic collection, sharing, and analysis of population data.
Project Long-Term Goals

- Develop a habitat-based Le Conte’s Thrasher abundance model and population estimates within the Monument.

- Expand monitoring beyond the Monument using protocols established.

- Develop recommendations to guide restoration and management geared towards recovery.

- Continue monitoring to determine impacts of continuing land use and climate change.
Le Conte’s Thrasher

(San Joaquin population) (Toxostoma lecontei) is a Bureau of Land Management sensitive species as well as a California species of special concern. Its historical range was from southern Fresno County to the Transverse Ranges in Kern County, west through the Curanuma Valley (San Luis Obispo County). It is now found only in the Mariposa-McClure area, the Carrizo Plain, and possibly the Lost Hills area. The Carrizo Plain National Monument is one of the largest intact parcels of habitat in the thrasher’s current range. Current bird monitoring methods and programs do not adequately address censusing and tracking this secretive species, or its present exact distribution and habitat associations. It is a resident, non-migratory species; therefore, the factors that drive its population are local. Habitat loss due to energy development, agriculture, and wildfire may be the largest inhibitors of population growth and habitat reoccupation as Le Conte’s Thrashers in the San Joaquin Valley depend on the presence of saltbush (Amphelx species) and do not tolerate high levels of human disturbance.

Objectives:

Locally this project will establish a baseline population index of the San Joaquin population of Le Conte’s thrashers as well as a songbird inventory of breeding birds within the Carrizo Plain National Monument. This baseline information will assist in the long-term monitoring of population and species changes in suitable habitat and changes in distribution inside the National Monument. The information acquired regarding habitat associations and human disturbance factors in the National Monument can also serve to guide BLM in developing energy elsewhere on the San Joaquin Valley floor and other areas adjacent to the Monument.

Final Report to the BLM

Download the final report to the Bureau of Land Management presenting our findings from the 2010 and 2011 field season surveys conducted within the Carrizo Plain National Monument.

- Download report PDF
Online Data Entry

Citizen Scientists

Add a New Visit

Project Carrizo Plain National Monument Monitoring (CPNMM)
Form LeConte's Thrasher Survey Form
Location Priority_1_10 (PR1_10)
Date 2013-10-30 Time 06:00 to 09:00
Primary Observer My own observations

Finally, what species did you see at your survey area?

Enter observation information below, and click "next" or hit Enter after entering full observation data. Repeat for as many observations as you have for this visit. Use the Tab to move from field to field. Click on "Save & proof this visit" to save and review your entries. Click on "Save & start a new visit" to save and immediately start entering a new visit, proofing entries later.

Species Code or Name

Observation Data

Cues: C (Call), D (Drumming [e.g., woodpeckers]), F (Fly Over), H (Wing whir [e.g., hummingbirds, doves]), J (Juvenile), S (Song), V (Visual)

Behavior

Forage Flock Copulate Display Pair Material Food Nest Fledge

Observ. Comments

next

Save & proof this visit Save & start new visit

or:

No species observed
Save & proof this visit
Avian Knowledge Network

**Users**
Distribute observations from nodes (eg: GBIF, ORNIS)

**Node Partners**
Use node applications and services (eg: Joint Venture, Fed. Agency, Land Manager)

**Data Providers**
Contribute observations to nodes—surveys, counts, etc. (eg: BBS, Bird Observatory, eBird, Researchers)

**WORLDWIDE**
eBird
Cornell Lab of Ornithology

**CALIFORNIA**
CADC
PRBO
Conservation Science

**CANADA**
Nature Counts
Bird Studies Canada

**MIDWEST US**
MWADC
Midwest Coordinated Bird Monitoring

Point Blue
Carrizo Colloquium
Decision Support Systems

Data collection

Analysis, Decision-support (DST)

Data management
Statewide Models ~200 Species
www.data.prbo.org/cadc

GIS maps
Model results summary
Location/count data
Analysis tools

Le Conte’s Current and Future models
Focused on climate change impacts
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Projecting Across the Landscape

Spatial Predictions

Observations

Environmental variables
Projecting Across the Landscape

Vegetation type
Percent saltbush types within 1km (allscale and spiny)
Distance to stream
Mean Slope
Elevation

Spatial Predictions
Observations
Environmental variables
Percent Allscale Saltbush
Mean Slope
Vegetation Type
Projecting Across the Landscape

Historic sightings provided by the BLM and birders

42 initial locations

Spatial Predictions

Observations

Environmental variables
Projecting Across the Landscape

Model projected across the Monument

New data collected in 2010 used to test and refine the model.

Spatial Predictions

Observations

Environmental variables
Habitat Suitability Model
Comparison With Known Range
Plot Selection

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

Plots are 250m$^2$ – approximate size of a thrasher territory.

117 plots established.
Area search surveys (20 minutes)

- Allows thorough and repeatable survey of an area
- Works well for elusive species
- Flexible – allows for multiple observers and pauses to search and locate individuals and nests of birds
- Provides information on abundance
- Provides information on habitat relationships via vegetation relevés
La Conte’s Thrasher Survey Form - Carrizo Plain

Observer Information

<table>
<thead>
<tr>
<th>First name</th>
<th>Last name</th>
<th>Date</th>
<th>Visit # (if known)</th>
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<table>
<thead>
<tr>
<th>Email address</th>
<th>Start time</th>
<th>End time</th>
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<tr>
<th>Phone (if applicable)</th>
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Survey Information

<table>
<thead>
<tr>
<th>Temp (°F or °C)</th>
<th>Wind speed</th>
<th>Wind direction</th>
<th>Rain</th>
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<tbody>
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PLOT

<table>
<thead>
<tr>
<th>Boundaries</th>
<th>East</th>
<th>North</th>
<th>West</th>
<th>South</th>
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<tr>
<td></td>
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Vegetation (entire plot)

<table>
<thead>
<tr>
<th>Common Saltbush</th>
<th>% Cover</th>
<th>High ht (0.1 m)</th>
<th>Low ht (0.1 m)</th>
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<table>
<thead>
<tr>
<th>Spiny Saltbush</th>
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<table>
<thead>
<tr>
<th>Ephedra</th>
<th>Other shrubs</th>
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</thead>
<tbody>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Trees</th>
<th>Grass</th>
<th>Barren Ground</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

Bird & Mammal Species Within Plot

<table>
<thead>
<tr>
<th>Species</th>
<th>Tally of Individuals</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(e.g., Visual, Call, one letter per individual)</td>
<td>(check if applicable)*</td>
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Additional notes/obs


Jim Tietz  and volunteer
Vegetation Relevés

( By plot and LETH sighting)

- 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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Le Conte’s Thrasher Detections

2010 – 18 detections over 234 plot visits
2011 – 47 detections over 170 plot visits
2012 – 46 detections over 152 plot visits
2013 - 48 detections over 201 plot visits

Actual nest site
# Total Species Detected

53 avian species and 5 mammals detected during surveys

<table>
<thead>
<tr>
<th>American Pipit</th>
<th>Horned Lark</th>
<th>Savannah Sparrow</th>
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</thead>
<tbody>
<tr>
<td>Bewick's Wren</td>
<td>House Finch</td>
<td>Say's Phoebe</td>
</tr>
<tr>
<td>Brewer's Blackbird</td>
<td>Lark Sparrow</td>
<td>Sharp-shinned Hawk</td>
</tr>
<tr>
<td>Burrowing Owl</td>
<td>Le Conte's Thrasher</td>
<td></td>
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<tr>
<td>Spotted Towhee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California Towhee</td>
<td></td>
<td>Western Meadowlark</td>
</tr>
<tr>
<td>Common Raven</td>
<td>Mountain Bluebird</td>
<td></td>
</tr>
<tr>
<td>Le Conte's Thrasher</td>
<td></td>
<td>White-crowned Sparrow</td>
</tr>
<tr>
<td>Cooper's Hawk</td>
<td>Mourning Dove</td>
<td></td>
</tr>
<tr>
<td>Eurasian Collared-Dove</td>
<td>Northern Mockingbird</td>
<td>European Starling</td>
</tr>
<tr>
<td>Starling</td>
<td>Peregrine Falcon</td>
<td>Ferruginous Hawk</td>
</tr>
<tr>
<td>Wren</td>
<td>Golden Eagle</td>
<td>Sage Sparrow</td>
</tr>
<tr>
<td>Hermit Thrush</td>
<td>Sage Thrasher</td>
<td></td>
</tr>
</tbody>
</table>

**Mammals** Black Tailed Jackrabbit

<table>
<thead>
<tr>
<th>California Ground Squirrel</th>
<th>Desert Cottontail</th>
<th>San Joaquin Antelope Squirrel</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Joaquin Kit Fox</td>
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</tbody>
</table>
Habitat Model Test

Model testing was good – with a high ability to discriminate between presence location and a random location.
Habitat Associations

Only two species of shrub associated with thrasher sightings: allscale saltbush (*Atriplex polycarpa*) and desert tea (*Ephedra californica*)

Highest densities in areas with large shrubs

Largest shrubs found on flat or gently sloping open habitat

- ~15% shrub cover and 14% bare ground
Habitat Associations

Thrasher detection where allscale saltbush was absent tended to have more desert tea (*Ephedra*)

- ~12% cover of desert tea when allscale absent
Habitat Associations

Little association with spiny saltbush (*Atriplex spinifera*)
Habitat Associations - Nests

Nests located each year – approx 20 nests total

Most nests located in Allscale Saltbush but also in Desert Tea (*Ephedra*)

Average 1.5 meters in height

Allscale or Ephedra cover average 15%

Bare ground average 26%

Grass cover average 56%
Occupancy Modeling

Allow us to explore occupancy in relation to habitat characteristics

Corrected for detection probability

As shrub cover increases, occupancy decreases

In line with previous studies
Tall sparse shrubs needed for nesting and foraging
Occupancy Modeling

As bare ground increases, occupancy increases

Also in line with previous studies
Bare ground needed for foraging
Other Findings

Some areas of the Monument appeared to have unhealthy allscale saltbush – unknown causes.

Areas along the western edge of the valley had few or no thrasher detections, despite habitat model. These areas appeared to have more moisture and denser shrub and ground cover.
Next Steps: Expand Surveys?
Needs and Recommendations

Continue to collect population and habitat data over time
  • Refine habitat association models
Needs and Recommendations

Continue to collect population and habitat data over time
  • Refine habitat association models

Use newly created vegetation layers to create abundance models across the landscape
  • Establish population goals and restoration targets
  • Identify potential habitat
Needs and Recommendations

Continue to collect population and habitat data over time
  • Refine habitat association models

Use newly created vegetation layers to create abundance models across the landscape
  • Establish population goals and restoration targets
  • Identify potential habitat

Connect or expand monitoring to other areas where San Joaquin population occurs
  • Determine health of overall population
  • Establish habitat connections between subpopulations (models and surveys/eBird?)
Acknowledgments

• **BLM** for financial support

• **BLM** biologists and ecologists **Kathy Sharum, James Weigand, and Geoff Walsh**

• The **volunteer surveyors** who donated their time: Matt Brady, Brent Campos, Ryan DiGaudio, Tom Edell, Geoff Geupel, Michelle Gilbert, Oliver James, Nora Livingston, Alex Metea, Adam Searcy, Kristin Sesser, Kathy Sharum, Maggie Smith, and Khara Strum,
Thank you!
Sampling Climate Space

Points represent eBird and point counts in principal components space for environmental data.
Principal Components For a Single Species

- Red = eBird
- Blue = point counts
- Yellow warbler