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Pilot Test of Desert Tortoise Occupancy Sampling First Year Preliminary Results

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Outline

- BCCE Management Goal
- Occupancy Sampling
- Study Objectives
- Development of Protocol
- 2013 Activities
- Study Design
- 2013 Preliminary Results
- Protocol Adjustments
- Next Steps



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BCCE Management Goal

- Manage BCCE for the Desert Tortoise
 - Make informed land management decisions to benefit the desert tortoise
 - Implement adaptive management practices at useful spatial and temporal scales





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Occupancy Sampling

- Assesses population status and trends by changes in the proportion of occupied sample units
 - Occupied is defined by live tortoises or active burrows
 - Does not estimate abundance or density
- Greater ability to detect annual changes in status and trends



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Study Objectives

Desert Tortoise Occupancy and Habitat Covariates Sampling Pilot Study

1. Analyze status and trend in desert tortoise occupancy/
use within the BCCE
2. Correlate pattern and change in occupancy/use with
habitat, habitat alteration, and management practices
 - Covariates (soils, vegetation, threats)



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Development of Protocol

Pilot Test for Occupancy Developed by:

- Enduring Conservation Outcomes, LLC
- DCP staff

Input Provided by:

- USFWS, Recovery Office and Local Office
- University of Arizona
- Independently Peer Reviewed

Monitoring Protocol

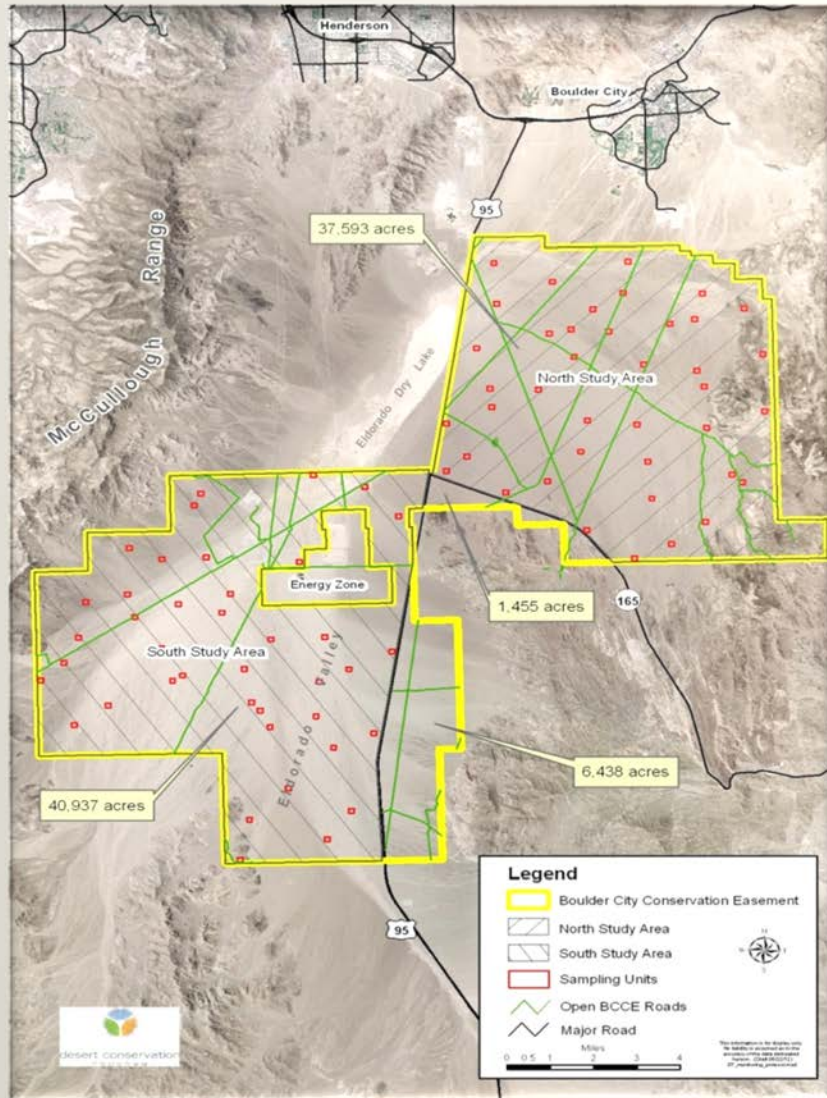
Testing the Use of Occupancy Sampling
to Detect Status and Trends of
Mojave Desert Tortoise in the
Boulder City Conservation Easement

Clark County
Multiple Species Habitat Conservation
Plan





- Implemented monitoring protocol for desert tortoise occupancy sampling
 - Data collection for first field season
 - NewFields Companies, LLC
- Reviewed and prepared data for analysis
 - 2 years of data



Two study areas

- North Study Area
 - 37,593 acres
- South Study Area
 - 40,937 acres
- 80 randomly placed survey plots
 - 40 in each area
 - 4 hectares



- Field season
 - Mid March through mid May
 - Field day
 - Start 30 minutes after sunrise, end ~ 2:00 p.m.
- Survey plots
 - Each three times during the season
 - Each first in the day at least once
 - 10-meter belt transects
 - 100% coverage
 - Incidental observations





- Six Data Forms

1. Start Plot
2. Live Tortoise
3. Burrow
4. Carcass
5. End Plot
6. End Day

- Data Collection

- GPS Trimble XT
- A cloud-based *mobile data collection* tool

- Tracked Route Logs

- Garmin





• Tortoise

– Ground temperature

– Location of tortoise

- Burrow, open, rock, vegetation, pallet, wash

– Behavior

– Adult Tortoise Measurements

- Sex
- MCL
- Tagged

Live Tortoise Data Sheet

Observation #: 1 GPS Unit #: 1 Date: 2012/04/27 Time: 1304
(YYYY/MM/DD) (0000-2400)

Plot #/INCIDENTAL (circle one): BC-B-024 Observer Name: Bickmore

UTMs: N 3969068.13 E 686850.62

Location of Tortoise (circle one): Burrow Open Rock Vegetation Pallet Other: _____

Behavior when found (circle one): Walking Basking Eating Digging
 Resting Fighting Mating Other: _____

Cloud Cover (circle one): Cloudy Overcast Sunny Raining Other: _____

Tortoise found in wash (circle one): Yes No Ground Temperature: 30 °C

Sex (circle one): Male Female Unknown MCL: 187.2 mm

Tag # (if present): N/A Tag color (if present): N/A

New Tag # (if applied): DCP-001 Photograph Taken (circle one): Yes No

Observation #: _____ GPS Unit #: _____ Date: _____ Time: _____
(YYYY/MM/DD) (0000-2400)

Plot #/INCIDENTAL (circle one): _____ Observer Name: _____

UTMs: N _____ E _____

Location of Tortoise (circle one): Burrow Open Rock Vegetation Pallet Other: _____

Behavior when found (circle one): Walking Basking Eating Digging
 Resting Fighting Mating Other: _____

Cloud Cover (circle one): Cloudy Overcast Sunny Raining Other: _____

Tortoise found in wash (circle one): Yes No Ground Temperature: _____ °C

Sex (circle one): Male Female Unknown MCL: _____ mm

Tag # (if present): _____ Tag color (if present): _____

New Tag # (if applied): _____ Photograph Taken (circle one): Yes No



- **Adult Tortoise Burrows**

- Condition of burrow
- Burrow dimensions
- Burrow location (wash)
- Substrate type
- Photograph

- **Active Classification**

- Burrow, den

Burrow Observation Data Sheet

Observation #: 1 GPS Unit #: 1 Date: 2012/04/27 Time: 11244
(YYYY/MM/DD) (0000-2400)

Plot #/**INCIDENTAL** (circle one): incidental Observer Name: Bickmore

UTMs: N 3969292.85 E 686818.09 Is it (circle one): **Burrow** Den

Occupied by live tortoise: Yes / **No** / Unknown Tortoise Data Sheet completed: Yes / **No**

Burrow width: 190 cm Burrow height: 80 cm Burrow found in wash: Yes / **No**

Burrow collapsed or silted in: Yes / **No** Scat or tracks visible at burrow opening: **Yes** / No

Apron compacted or eroded from exposure: Yes / **No** Litter or debris accumulated at opening: Yes / **No**

Cobwebs present and trapped with debris or litter: Yes / **No** Burrow/Den Active: **Yes** / No / Unknown

Location of Burrow (circle one): Vegetation **Open** / Rock / Other: _____

Substrate Type (circle one): Sand **Gravel** / Rocky / Caliche / Other: _____

Photograph Taken (circle one): **Yes** / No

Observation #: 2 GPS Unit #: 1 Date: 2012/04/27 Time: 1309
(YYYY/MM/DD) (0000-2400)

Plot #/**INCIDENTAL** (circle one): BC-B-024 Observer Name: Bice

UTMs: N 3969189.77 E 686864.16 Is it (circle one): **Burrow** Den

Occupied by live tortoise: Yes / **No** / Unknown Tortoise Data Sheet completed: Yes / **No**

Burrow width: 200 cm Burrow height: 120 cm Burrow found in wash: Yes / **No**

Burrow collapsed or silted in: Yes / **No** Scat or tracks visible at burrow opening: Yes / **No**

Apron compacted or eroded from exposure: Yes / **No** Litter or debris accumulated at opening: Yes / **No**

Cobwebs present and trapped with debris or litter: Yes / **No** Burrow/Den Active: **Yes** / No / Unknown

Location of Burrow (circle one): **Vegetation** / Open / Rock / Other: _____

Substrate Type (circle one): Sand **Gravel** / Rocky / Caliche / Other: _____

Photograph Taken (circle one): **Yes** / No



Tortoise Observations

Tortoise Observations	#
Total Tortoise Observations	18
tortoise observations in plots	11
incidental tortoise observations	7
Tortoises not tagged	11
juvenile tortoises	4
tortoises in burrows	5
mating	2



Burrow Observations


Desert Tortoise Burrows Identified	#
Total Number of DT Burrows	171
active burrows identified	27
active burrows in plots	15
active incidental burrows	12
active burrows w/ tortoise	6




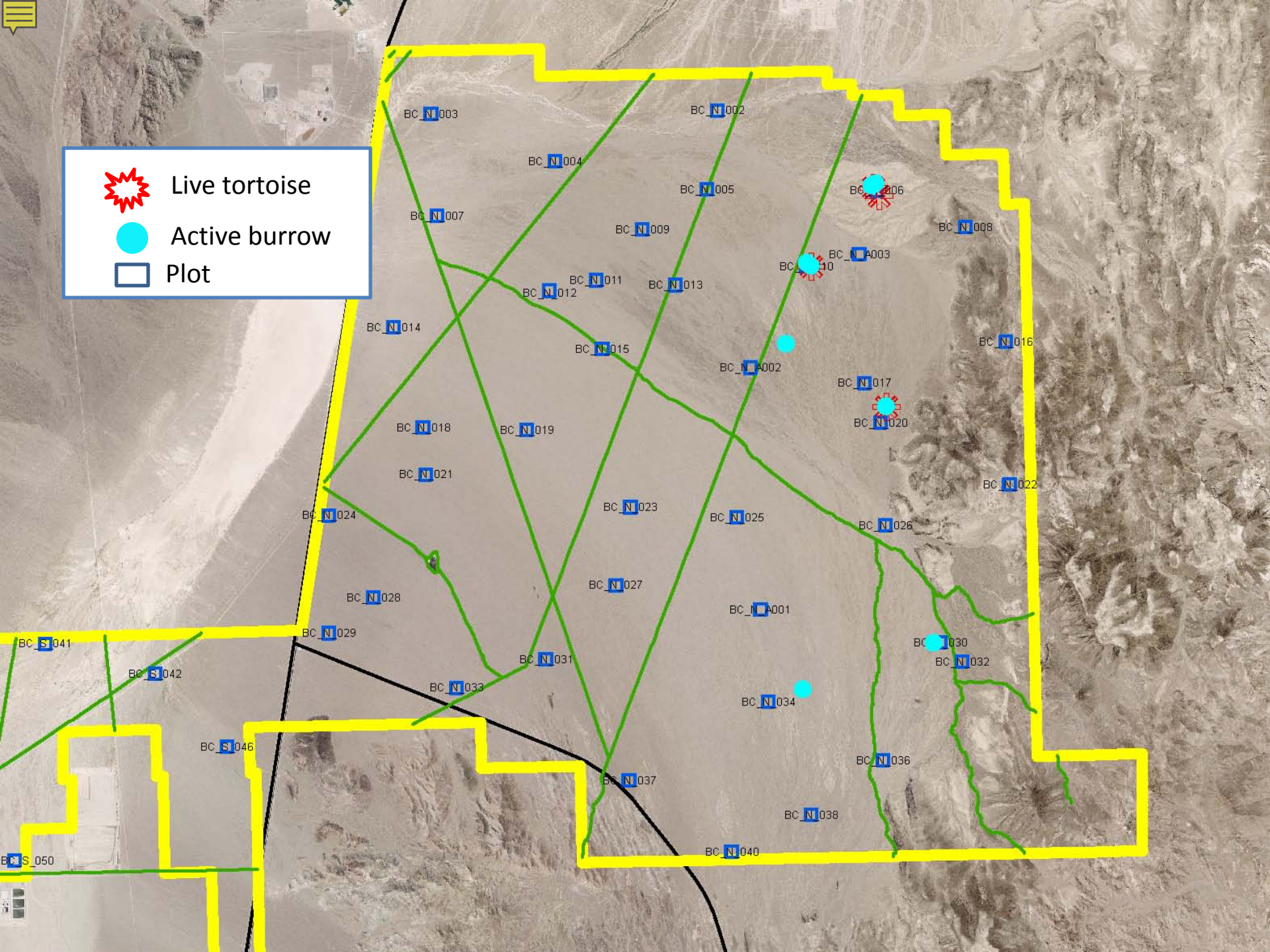
Occupied Plots

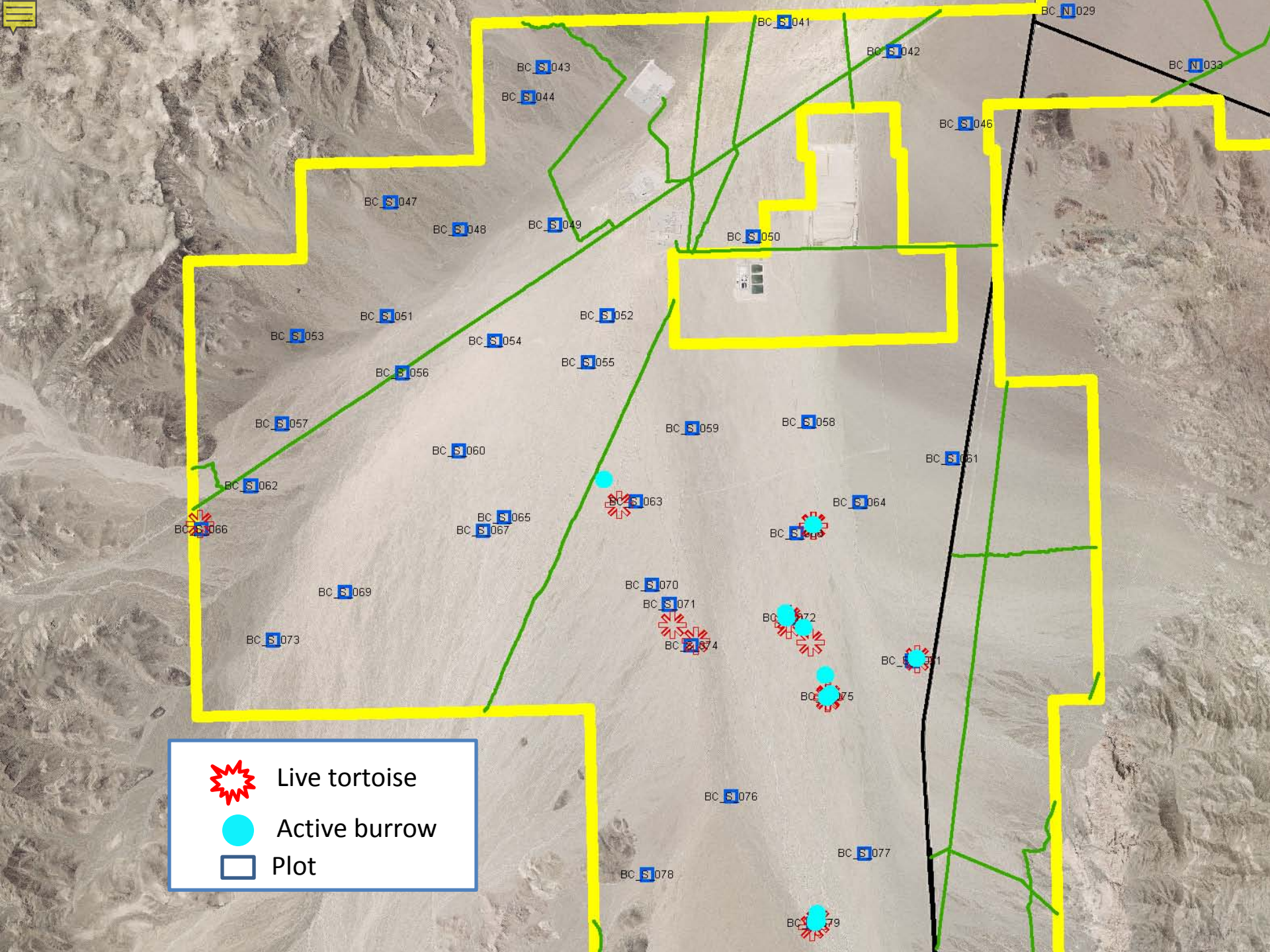
Observations	# of Observations	# of Plots
Number of Plots Occupied	7	7
Active Burrows in Plots	15	6
Tortoise Observations in Plots	11	7

 Live tortoise

 Active burrow

 Plot

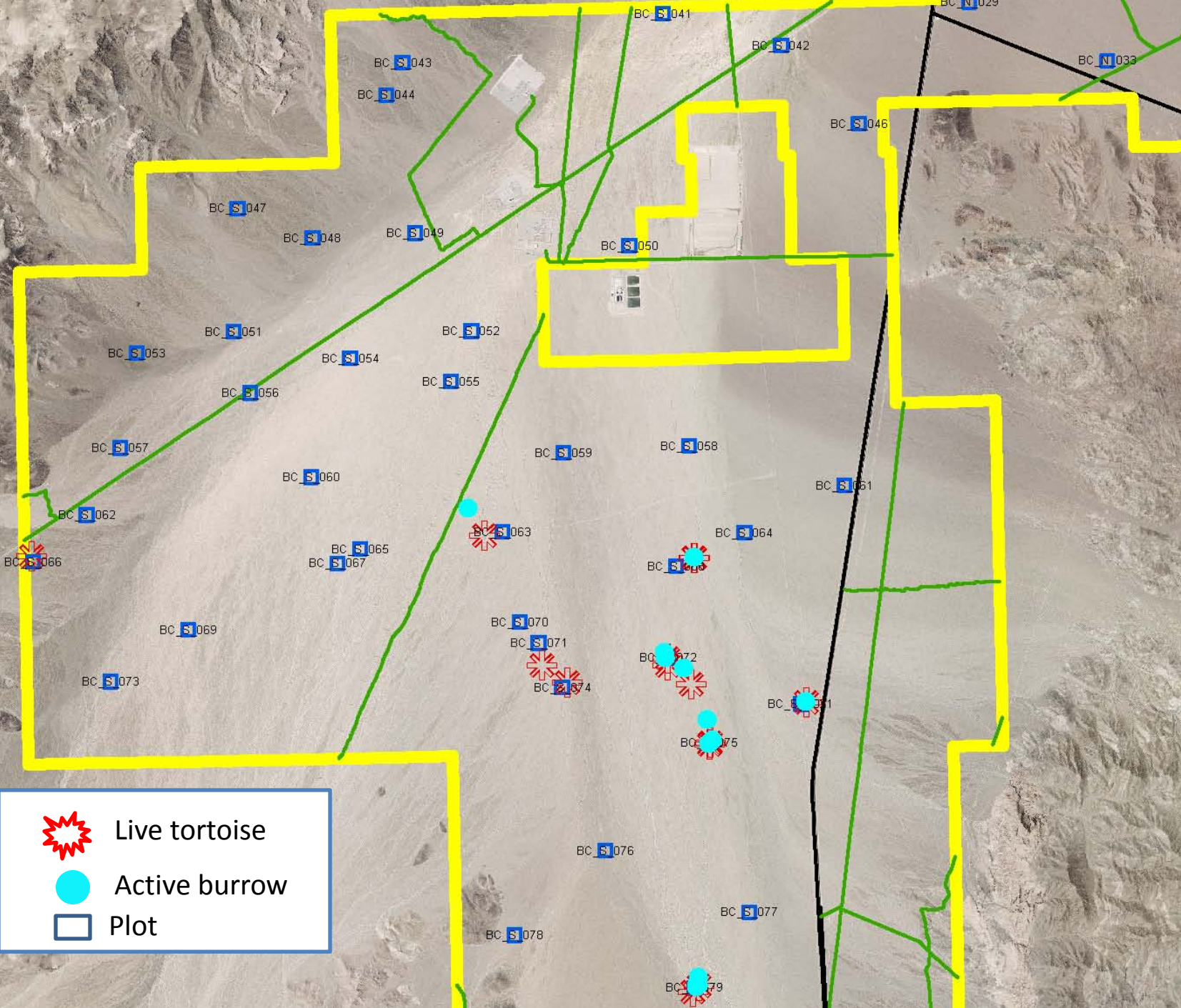




 Live tortoise

 Active burrow

 Plot





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2013

Preliminary Results

Tortoise Observations

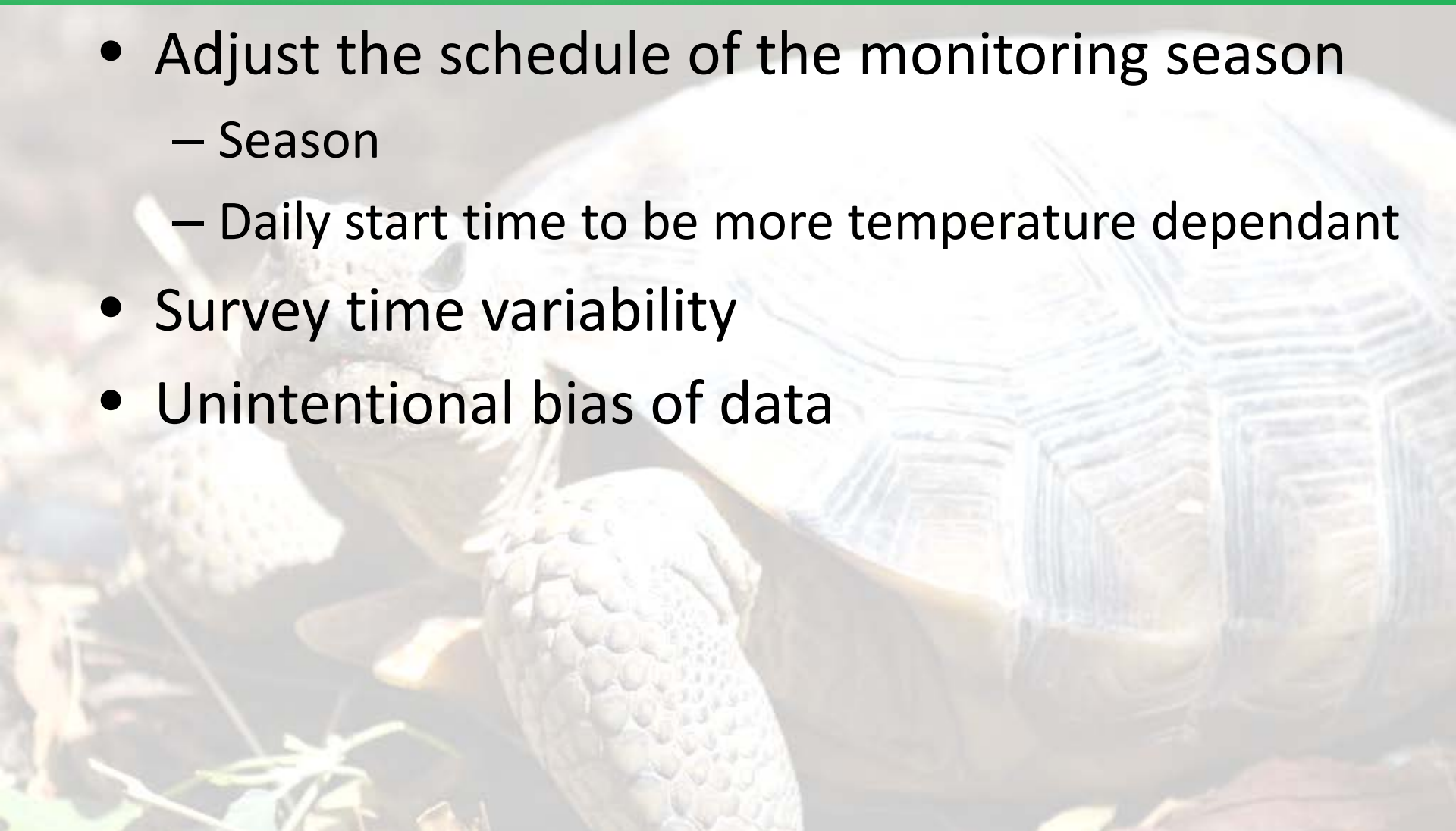
Plot Round	Dates	# Tortoises	Average Ground Temperature
1 st Round	3/11-3/25	1	24.5 °C
2 nd Round	3/26-4/7	6	36.27°C
3 rd Round	4/8-4/21	11	29.08 °C



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Protocol Adjustments

- Adjust the schedule of the monitoring season
 - Season
 - Daily start time to be more temperature dependant
- Survey time variability
- Unintentional bias of data





Next Steps

- Initiate covariate sampling
- Conduct second pilot field season
- Analyze occupancy sampling data
 - 2013-2014 occupancy data
- Correlate Occupancy and Covariate Data
- Finalize Protocol
- Habitat Model
- Recommendations for BCCE





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