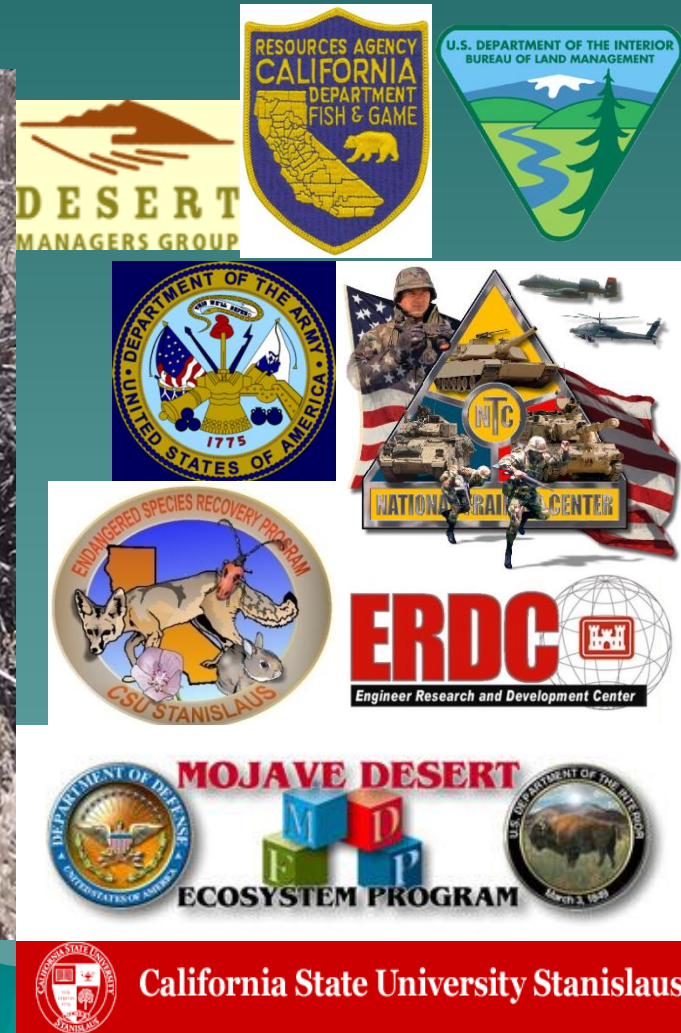


Use of Camera Traps to Survey and Monitor Mohave Ground Squirrels

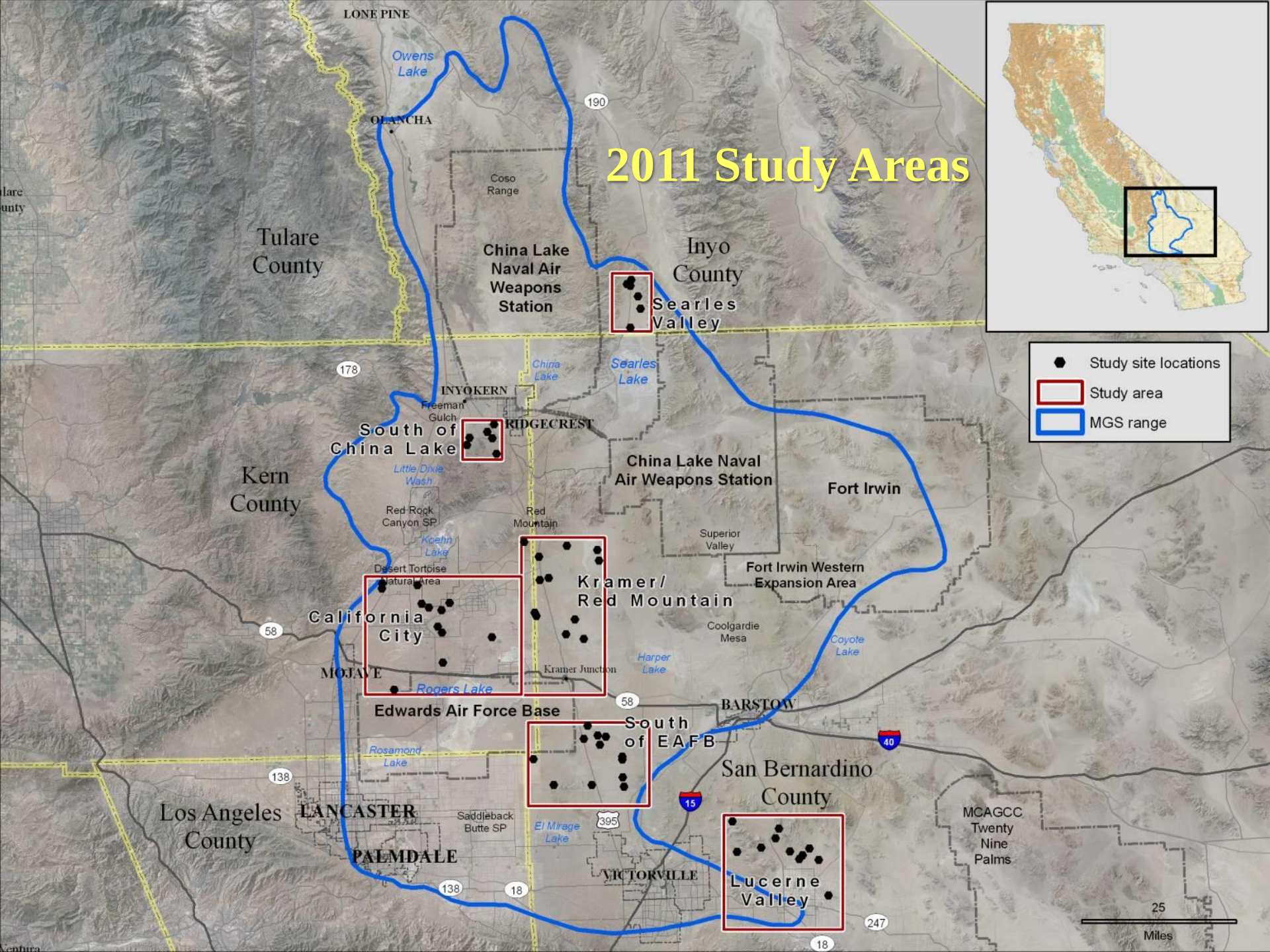
2011 Results



David Delaney
Philip Leitner



2011 Study Areas



Project Goals/Objectives 2011-12

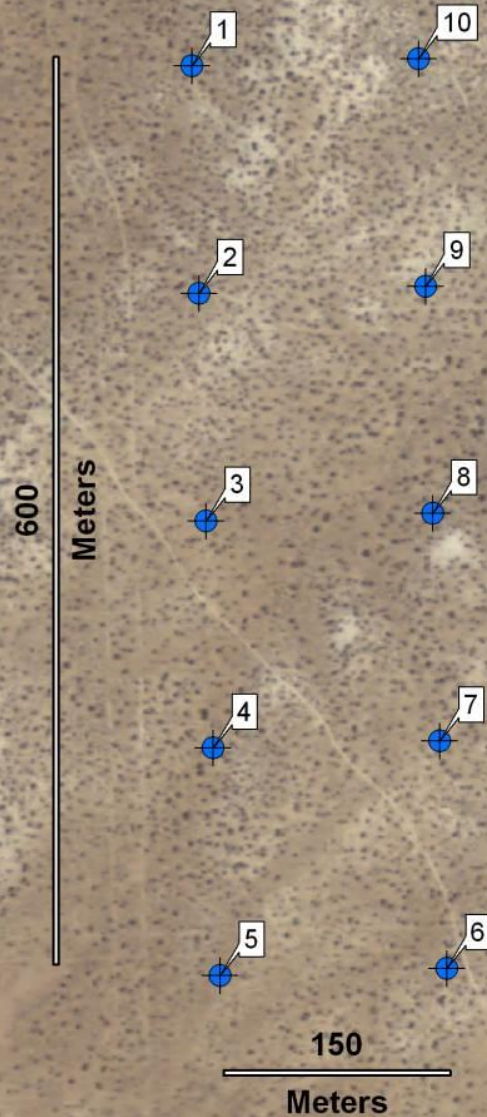
- ◆ Conduct large scale field test of camera trap surveys
 - ◆ Provide data to help validate the PACT model that the CEC PIER program is evaluating
 - ◆ Provide field data to help test the MGS habitat suitability model that the USGS has developed
 - ◆ Vegetation sampling data will be directly applicable with ongoing CDFG vegetation mapping projects
 - ◆ Research findings will be applicable across DoD and non-DoD lands
 - ◆ Project results will improve our knowledge of MGS distribution
- 
- A stylized, dark teal mountain range graphic is located in the bottom right corner of the slide, partially overlapping the text area.

Approach

- ◆ Record ground squirrel presence at 2 x 5 grid pattern feeding stations (10 cameras with 150 m spacing)
- ◆ Reconyx trail cameras: Models RC-60, HC500 and PC800 (0.2 trigger speed, no delay between HD photos)
- ◆ Record animal visitation 24 hours/day during weekdays
- ◆ Monitor potential MGS presence at 60 grids 3 times from Feb-June using camera traps



MGS seen at cameras
1, 2, 3, and 6



Sample Camera Trap Data: Mohave Ground Squirrel



White-Tailed Antelope Ground Squirrel

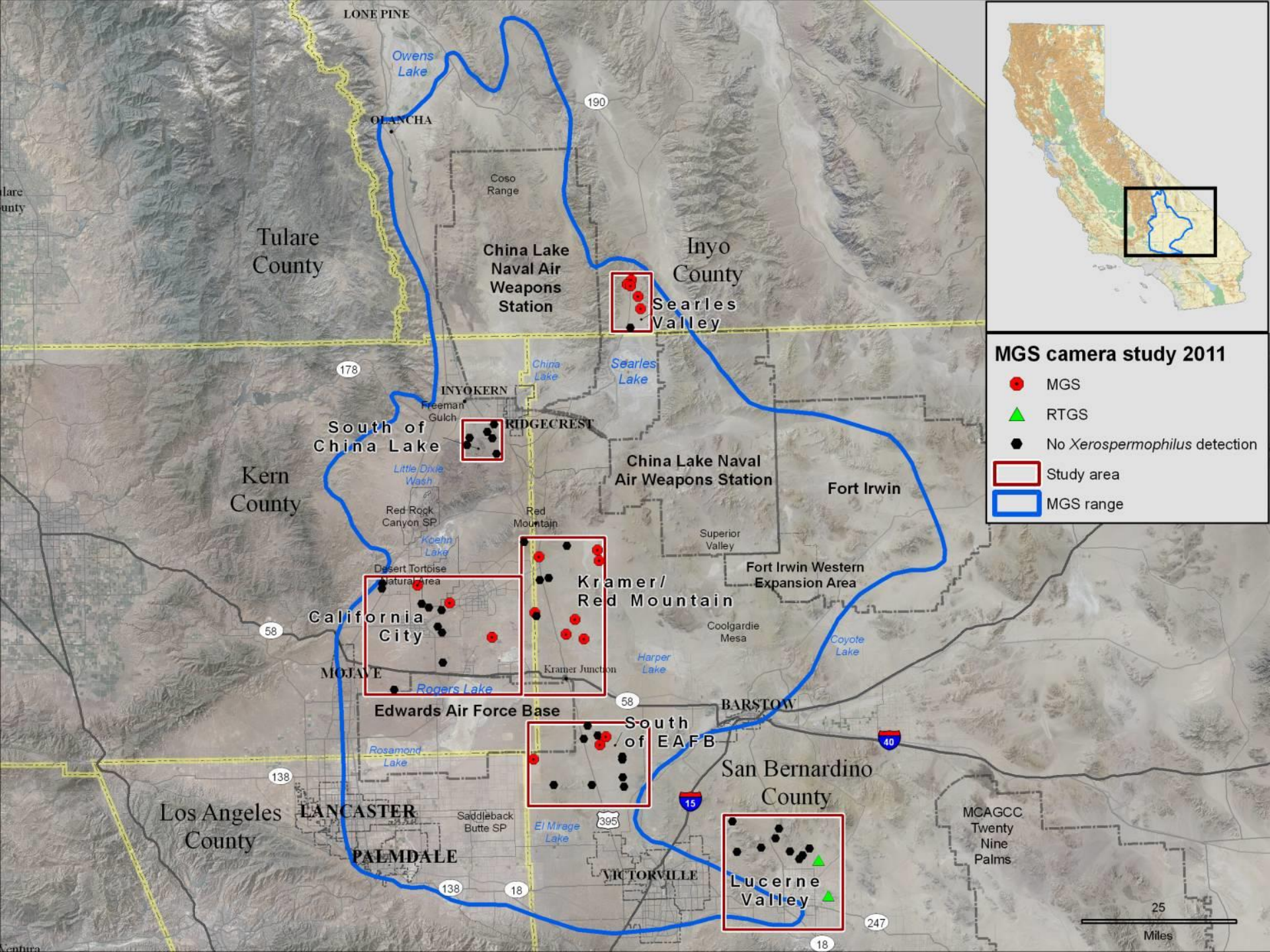


Round-Tailed Ground Squirrel

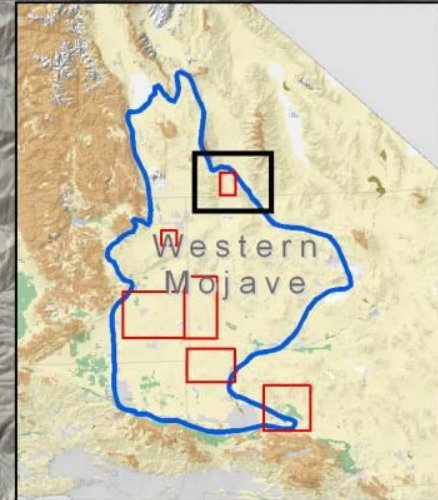


Grid Name	MGS Detections	RTGS Detections
Searles Valley	83.3% (5 of 6)*	0.0% (0 of 6)
S. of China Lake	0.0% (0 of 6)	0.0% (0 of 6)
California City	33.3% (4 of 12)*	0.0% (0 of 12)
Kramer/Red Mtn	58.3% (7 of 12)*	0.0% (0 of 12)
S. of EAFB	25.0% (3 of 12)*	0.0% (0 of 12)
Lucerne Valley	0.0% (0 of 12)	16.7% (2 of 12)
Total	31.7% (19 of 60)	3.3% (2 of 60)

* Detections to date. Could find additional MGS sites once data reduction is complete.



Inyo County



MGS camera study 2011

-  MGS
-  RTGS
-  No *Xerospermophilus* detection
-  MGS visual detections
-  Study area

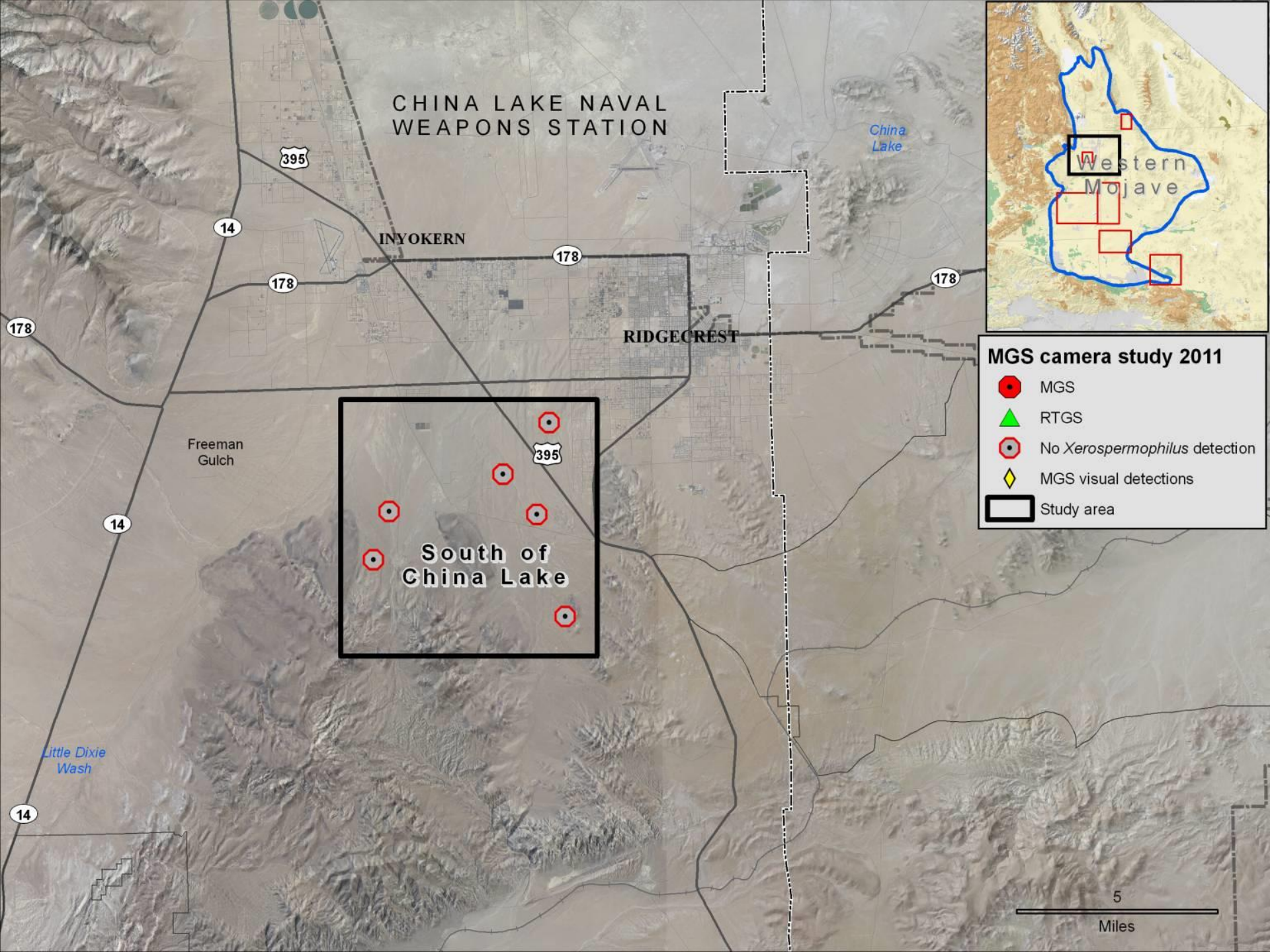
CHINA LAKE NAVAL
WEAPONS STATION

Searles
Valley

CHINA LAKE NAVAL
WEAPONS STATION

Searles Valley

5
Miles



CHINA LAKE NAVAL
WEAPONS STATION

China
Lake

INYOKERN

RIDGECREST

Freeman
Gulch

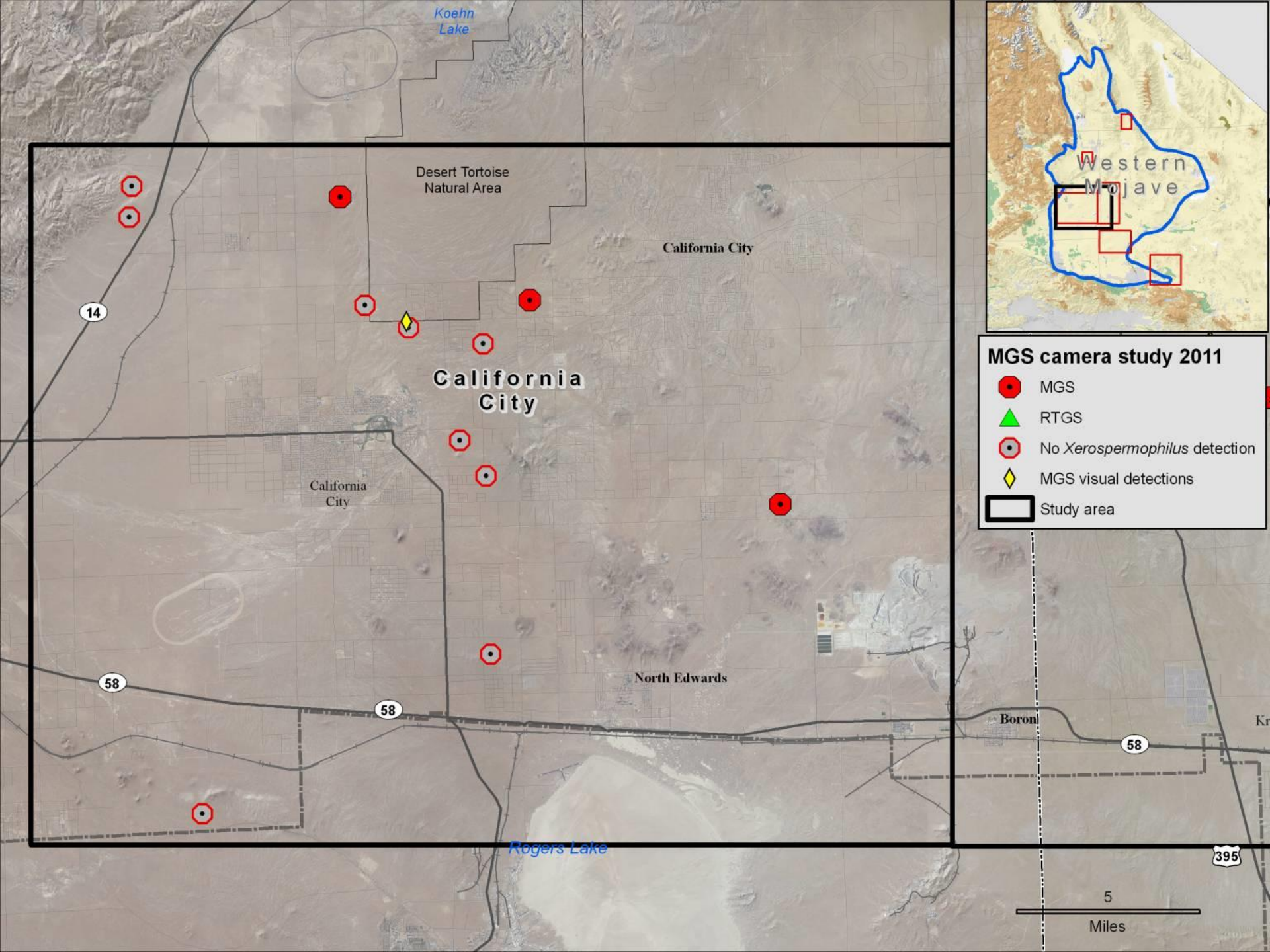
South of
China Lake

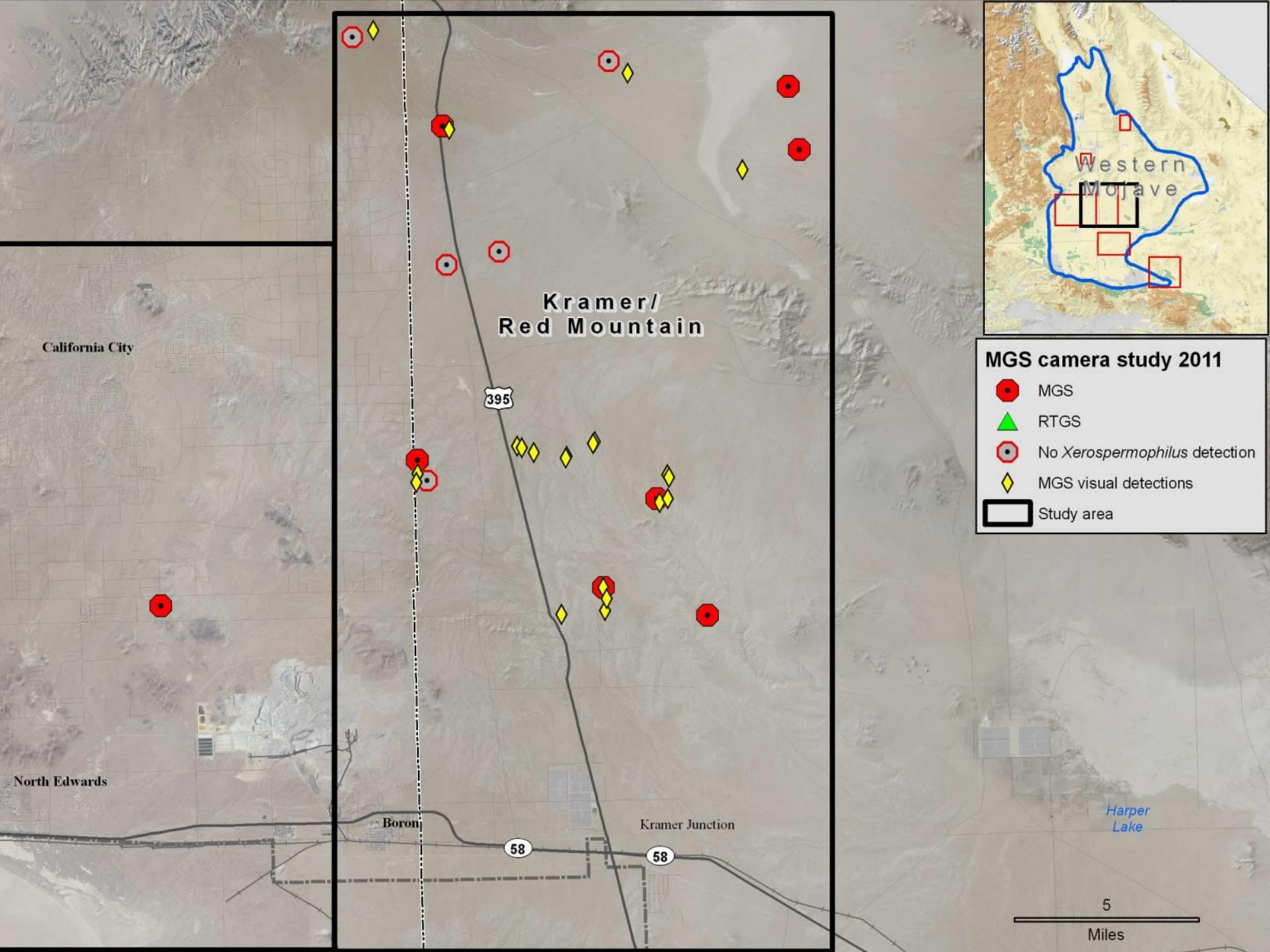
Little Dixie
Wash

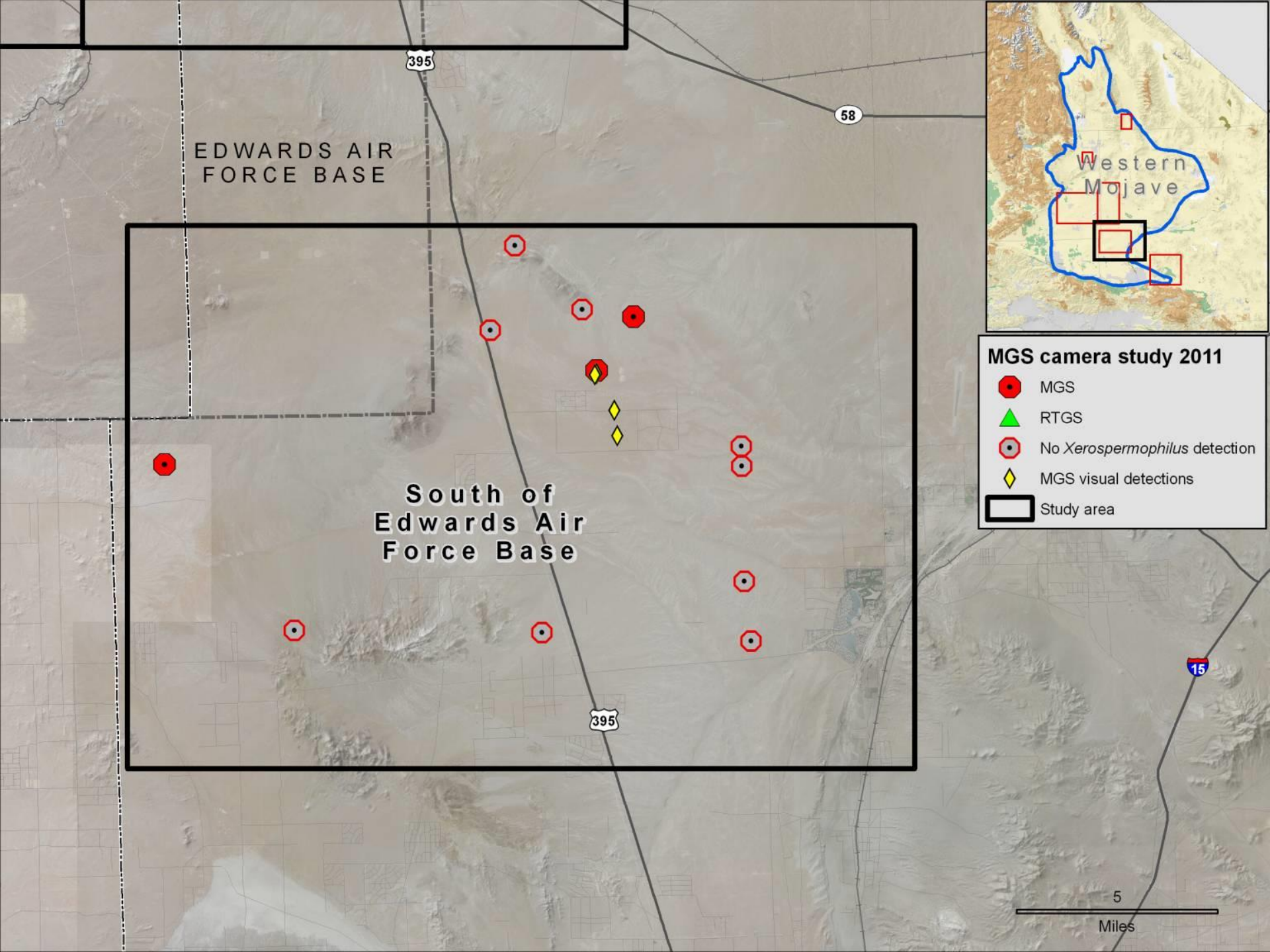
MGS camera study 2011

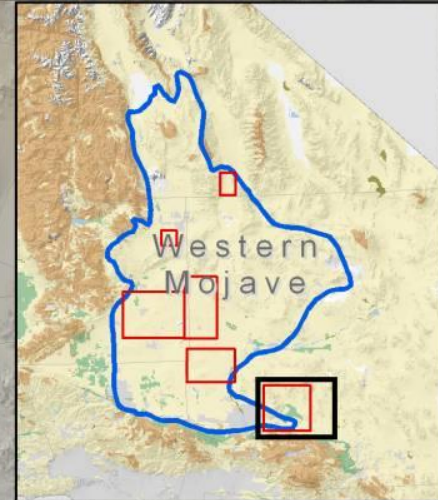
-  MGS
-  RTGS
-  No *Xerospermophilus* detection
-  MGS visual detections
-  Study area

5
Miles







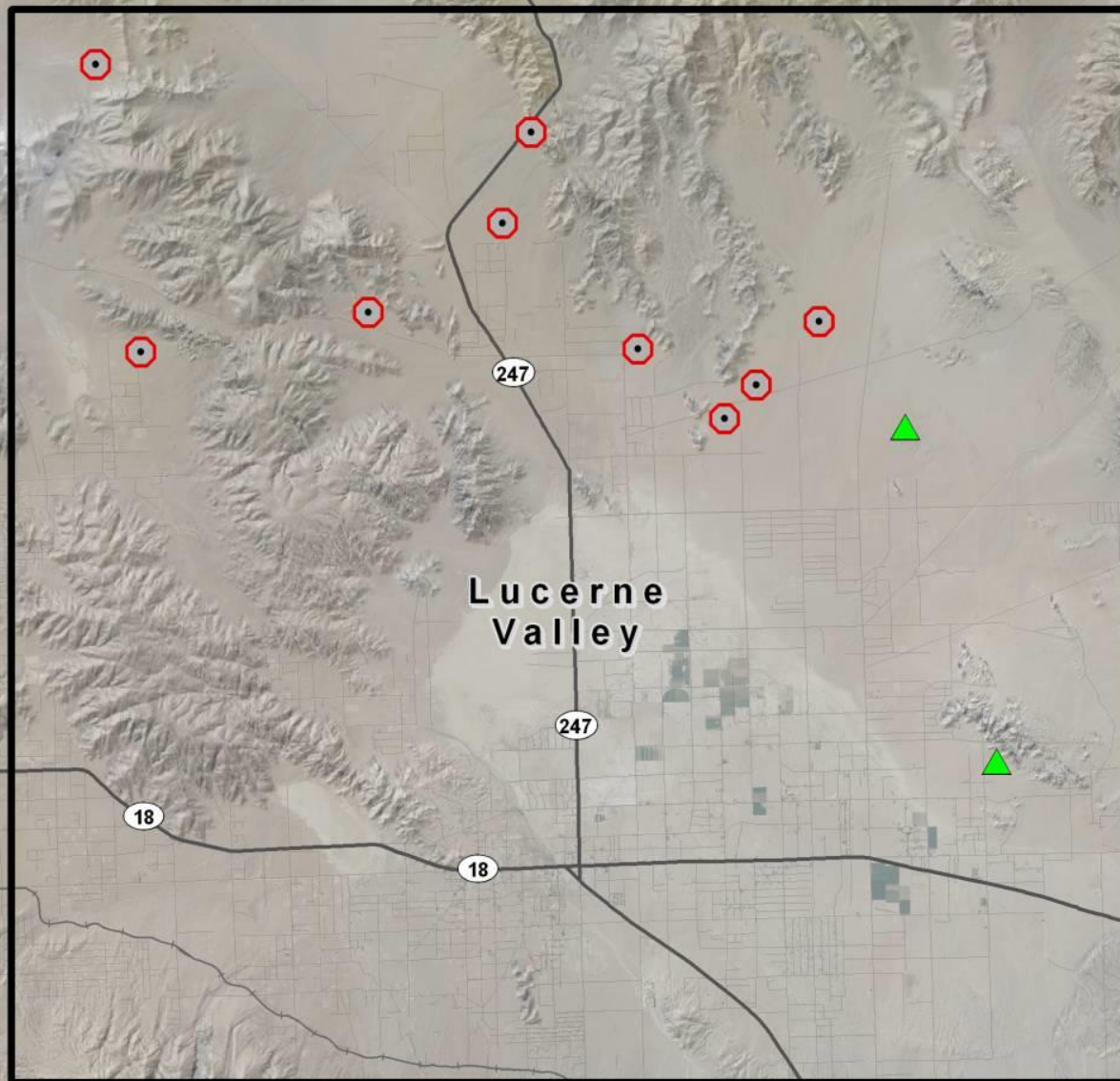


MGS camera study 2011

-  MGS
-  RTGS
-  No *Xerospermophilus* detection
-  MGS visual detections
-  Study area

San Bernardino
County

5
Miles



Summary of Preliminary 2011 Camera Trap Results

- ◆ Surveyed 60 grids 3 times in 2011 using camera traps (~600 camera sites) between Feb-June
 - ◆ Documented MGS, AGS, and RTGS presence at one or more locations
 - ◆ Documented general visitation times
 - ◆ Documented multiple visitations/day usually for all ground squirrel species
 - ◆ Documented intra- and interspecific interactions
 - ◆ Documented individual/group behavior
 - ◆ Documented multiple non-target species
- 
- A stylized, dark teal mountain range graphic is located in the bottom right corner of the slide, partially overlapping the text of the last bullet point. The mountains are depicted with sharp, jagged peaks and are rendered in a monochromatic teal color.

Intra-/Interspecific Interactions

AGS vs AGS



RTGS vs AGS



MGS vs AGS



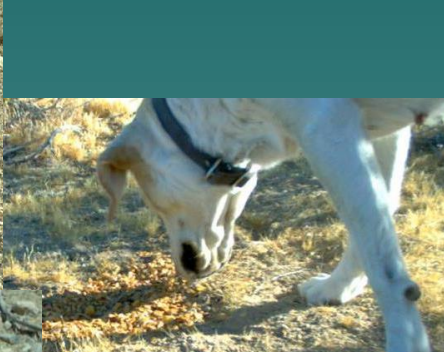
MGS vs MGS

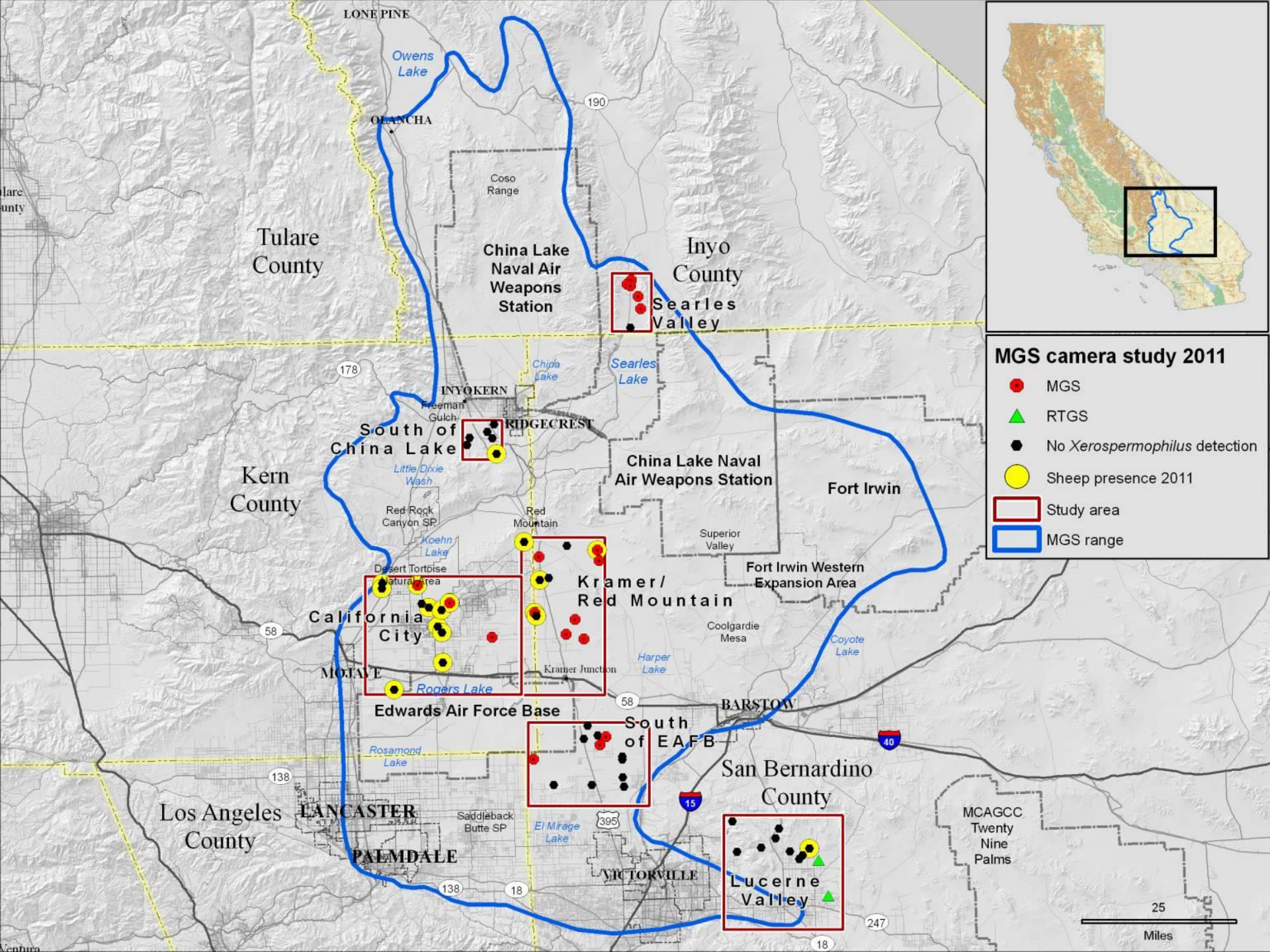


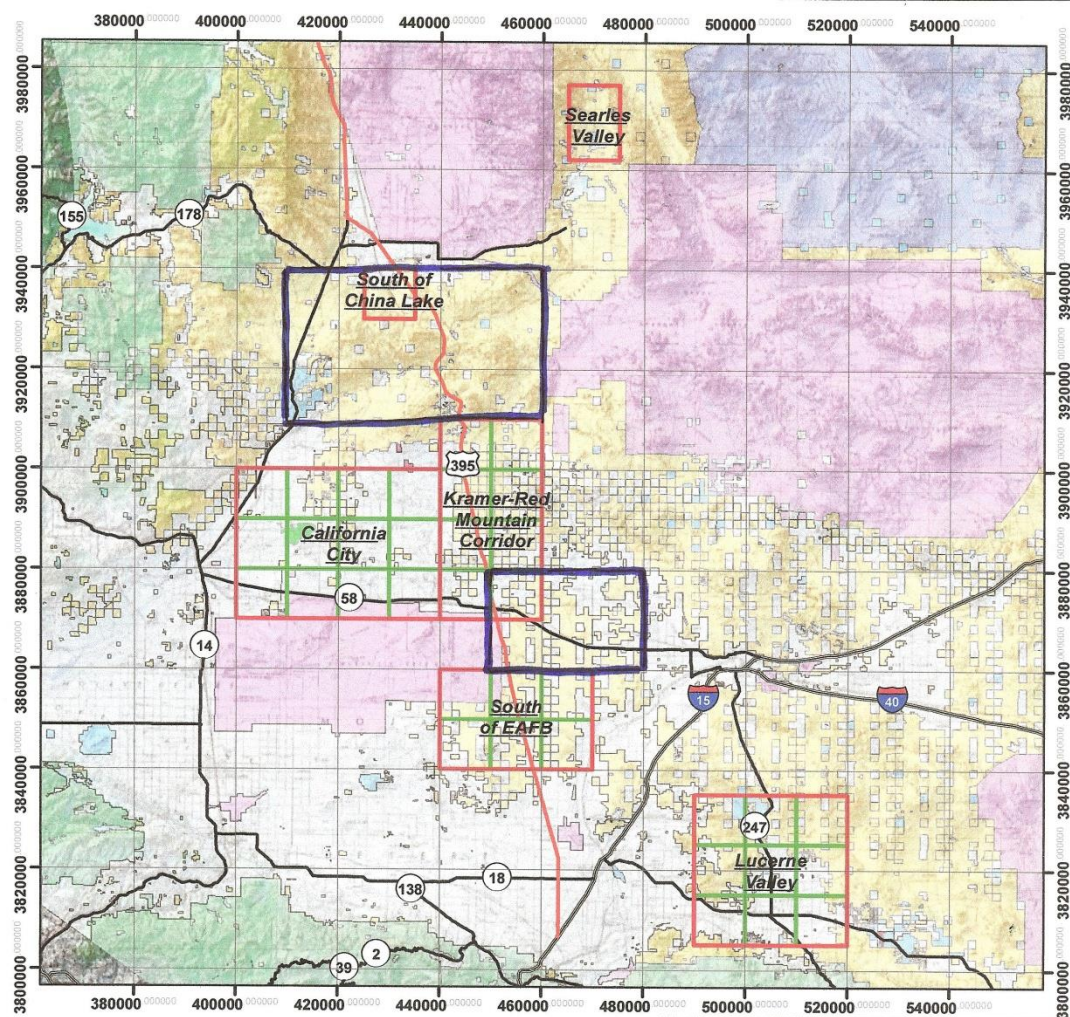
Examples of Nocturnal Non-Target Species Detections



Examples of Diurnal Non-Target Species Detections







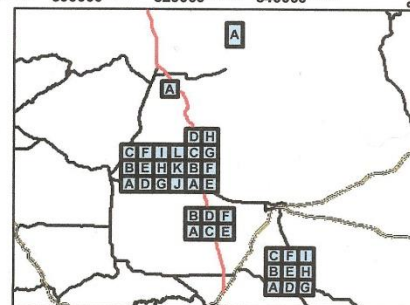
Overview

Mohave Ground Squirrel Survey Locations



*Possible 2012
Study Areas*

Legend



Map Prepared By:
MOHAVE DESERT

Questions?



2011-03-16 11:40:12 AM M 4/5

82°F



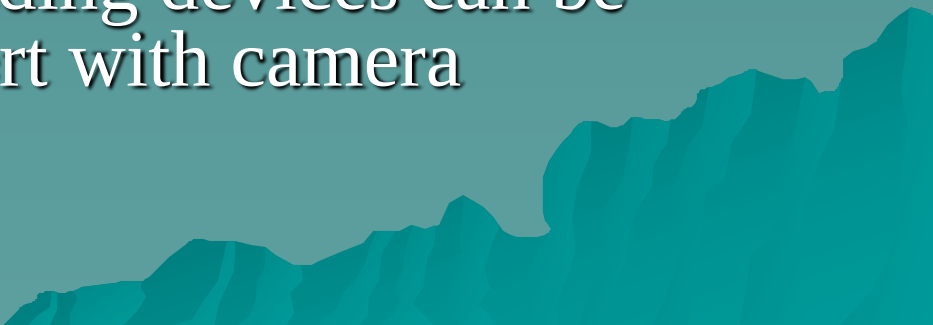
PC800 HYPERFIRE PRO

RECONYX

Advantages of Camera Traps

- ◆ Detect MGS if they are present at similar or greater effectiveness as live-traps
 - ◆ Does not require specialized qualifications/permits to operate, so is very cost effective
 - ◆ Non-invasive technique that is not limited by weather conditions
 - ◆ Documents activity patterns of animals
 - ◆ Records multiple visitations per day by animals
 - ◆ Documents intra-/interspecific behavioral interactions
 - ◆ Expedite live-trapping efforts
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, partially overlapping the text area.

Possible Future Uses of Camera Traps

- ◆ Determine the number of camera trap systems needed to fully sample conventional grid to directly compare with live-trapping surveys
 - ◆ Utilize camera traps to locate future trapping sites to improve the cost effectiveness of live-trapping
 - ◆ Investigate food preferences of MGS to possibly improve live-trapping effectiveness
 - ◆ Investigate how MGS interact with live-traps to possibly improve trapping effectiveness
 - ◆ Investigate if PIT tag reading devices can be effectively used in concert with camera traps/feeding stations
- 
- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, partially overlapping the bottom edge of the text area.