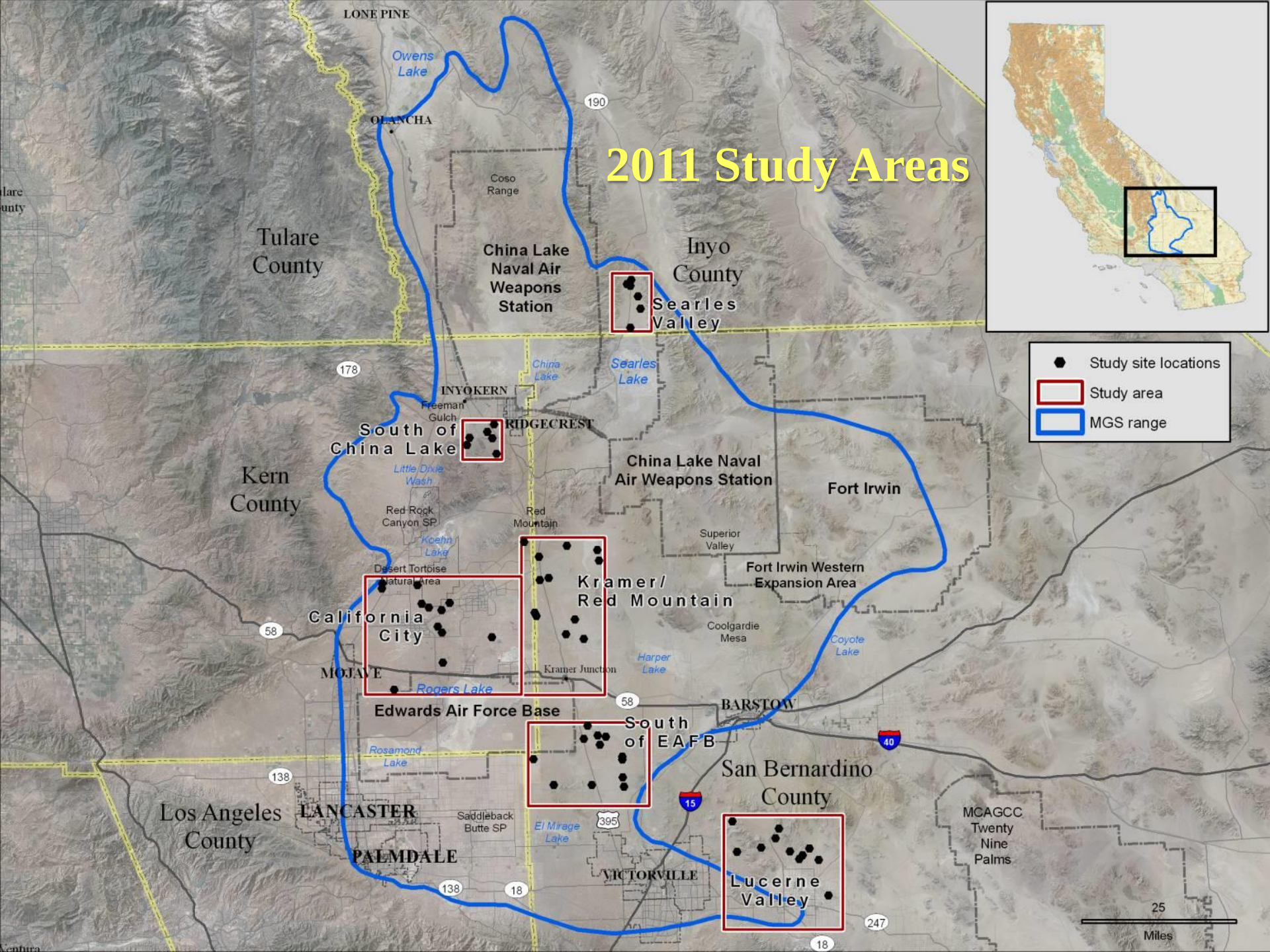
Use of Camera Traps to Survey and Monitor Mohave Ground Squirrels

2011 Results

David Delaney

Philip Leitner

California State University Stanislaus


2011 Study Areas
Study site locations
Study area
MGS range
LONE PINE
Owens Lake
OLANCHA
190
Coso Range
Tulare County
China Lake Naval Air Weapons Station
Inyo County
Searles Valley
178
China Lake
Searles Lake
INYOKERN
Freeman Gulch
RIDGECREST
South of China Lake
Little Dixie Wash
Kern County
China Lake Naval Air Weapons Station
Fort Irwin
Red Rock Canyon SP
Red Mountain
Koehn Lake
Superior Valley
Desert Tortoise Natural Area
Fort Irwin Western Expansion Area
Kramer/ Red Mountain
California City
58
Coolgardie Mesa
Coyote Lake
Harper Lake
MOJAVE
Kramer Junction
Rogers Lake
Edwards Air Force Base
BARSTOW
South of EAFB
40
Rosamond Lake
138
San Bernardino County
Los Angeles County
LANCASTER
Saddleback Butte SP
15
395
El Mirage Lake
MCAGCC Twenty Nine Palms
PALMDALE
VICTORVILLE
Lucerne Valley
138
18
247
18
25
Miles

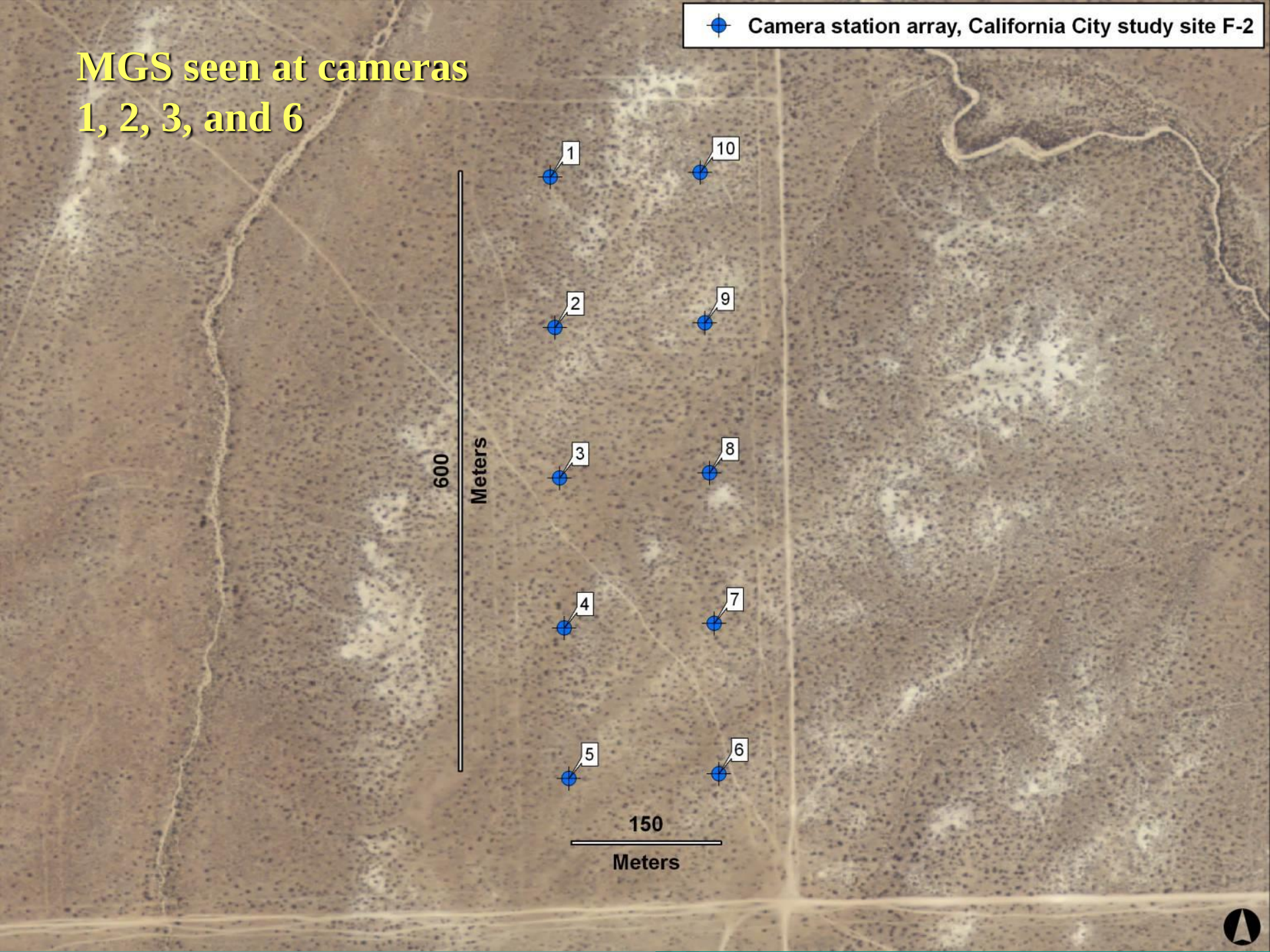
Project Goals/Objectives 2011-12

- 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

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



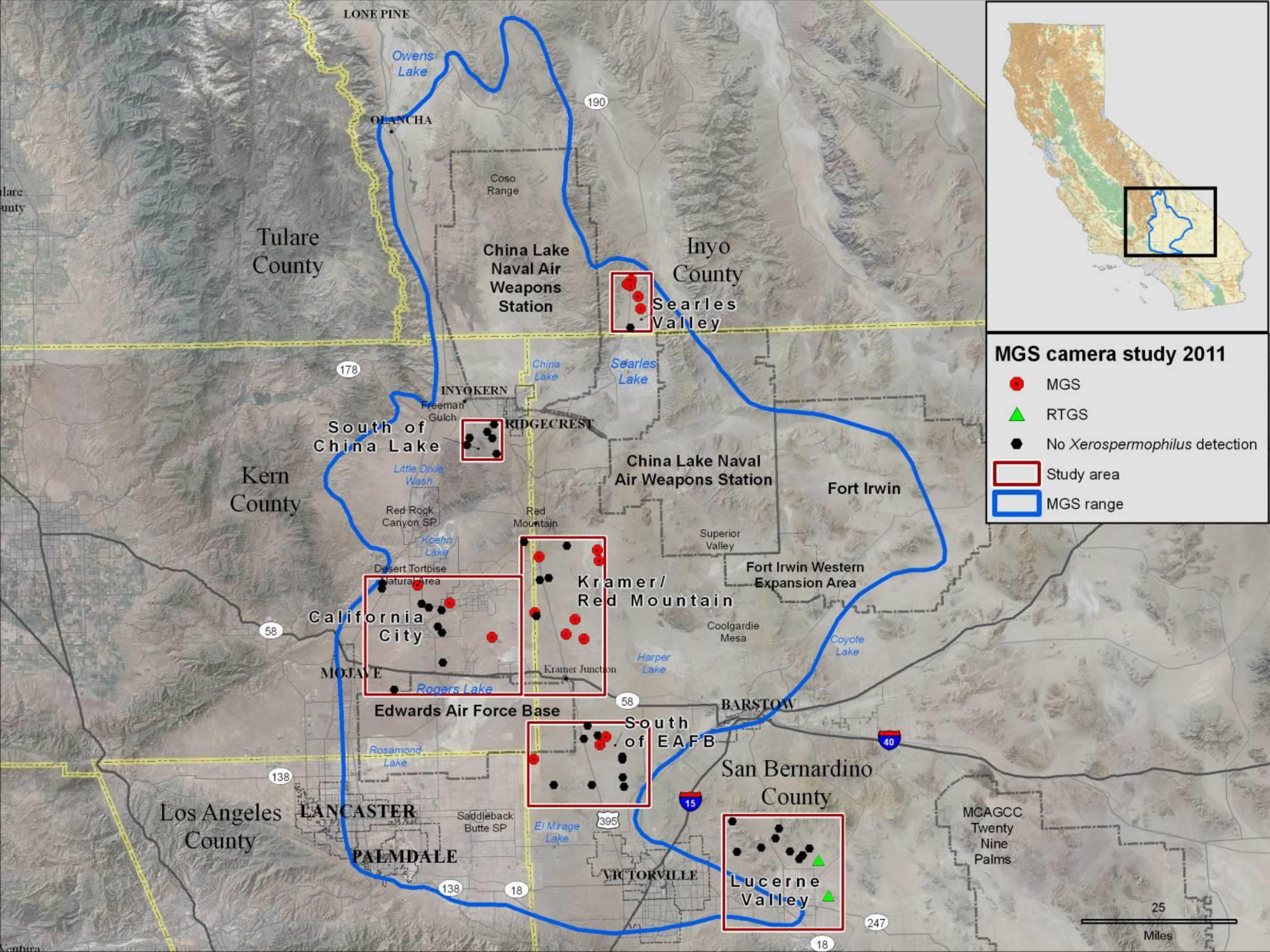
Sample Camera Trap Data: Mohave Ground Squirrel

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.


MGS camera study 2011
MGS
RTGS
No Xerospermophilus detection
Study area
MGS range
LONE PINE
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Coso Range
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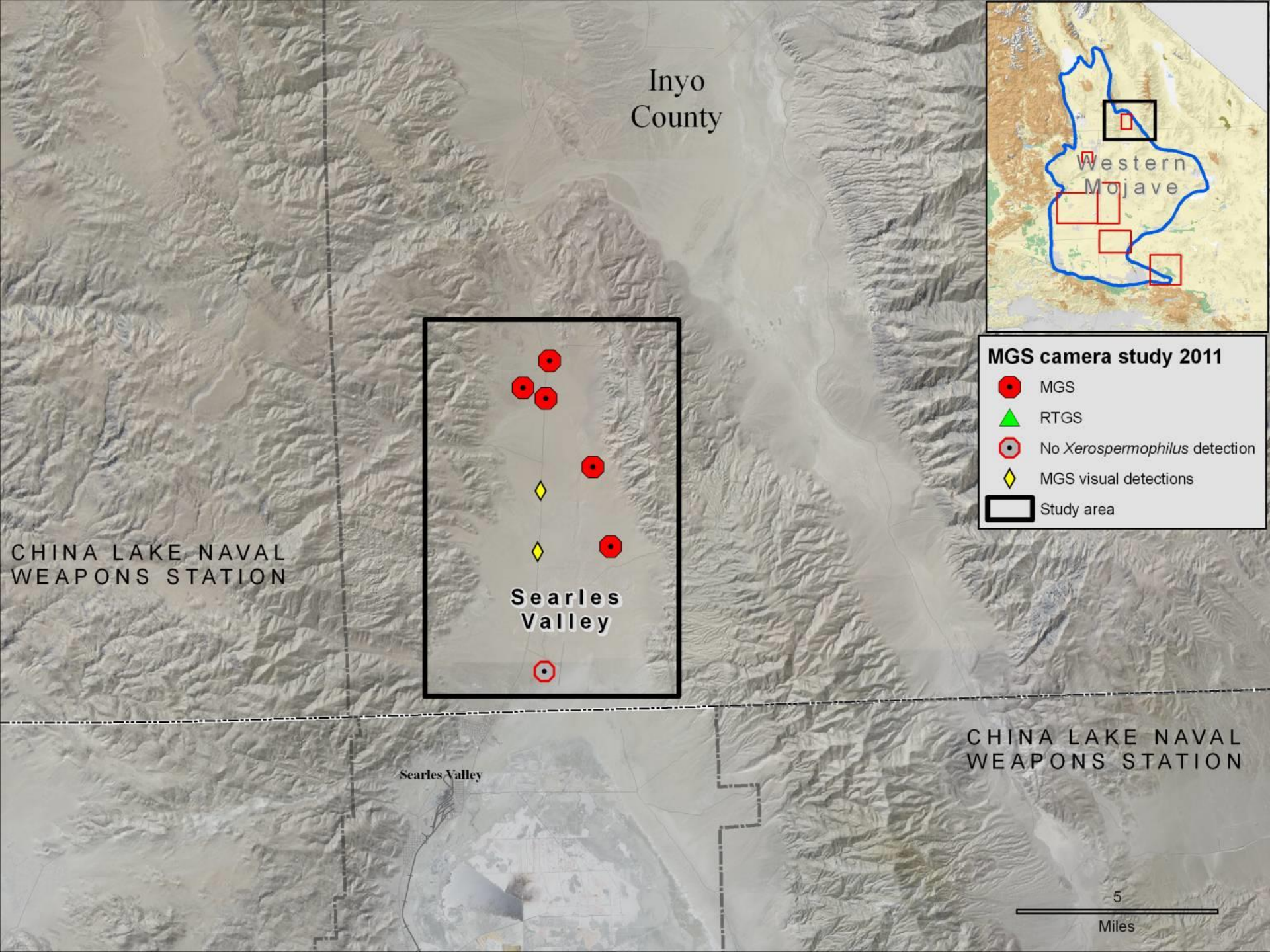
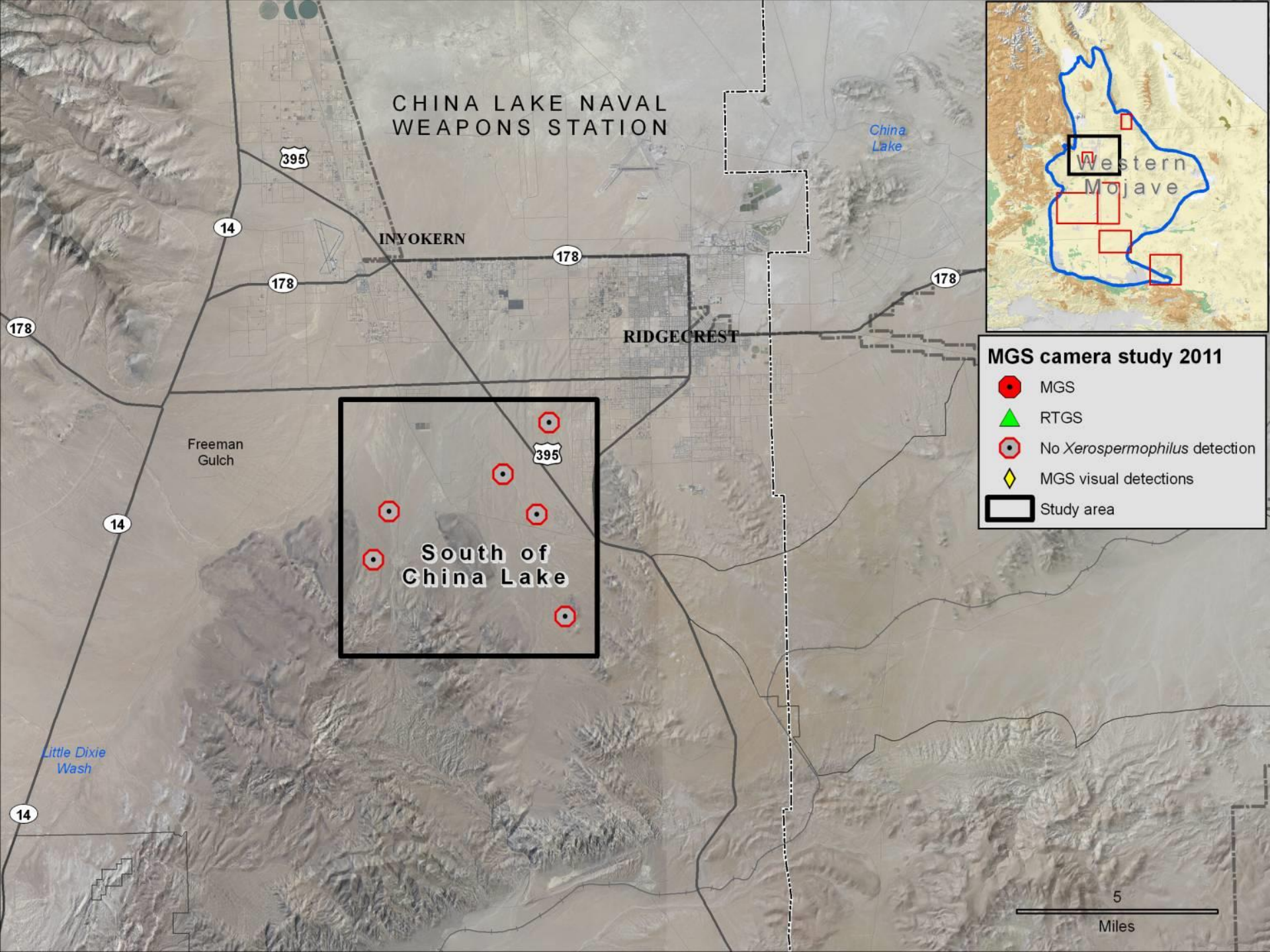

Inyo County
Western Mojave
MGS camera study 2011
MGS
RTGS
No *Xerospermophilus* detection
MGS visual detections
Study area
CHINA LAKE NAVAL WEAPONS STATION
Searles Valley
Searles Valley
CHINA LAKE NAVAL WEAPONS STATION
5
Miles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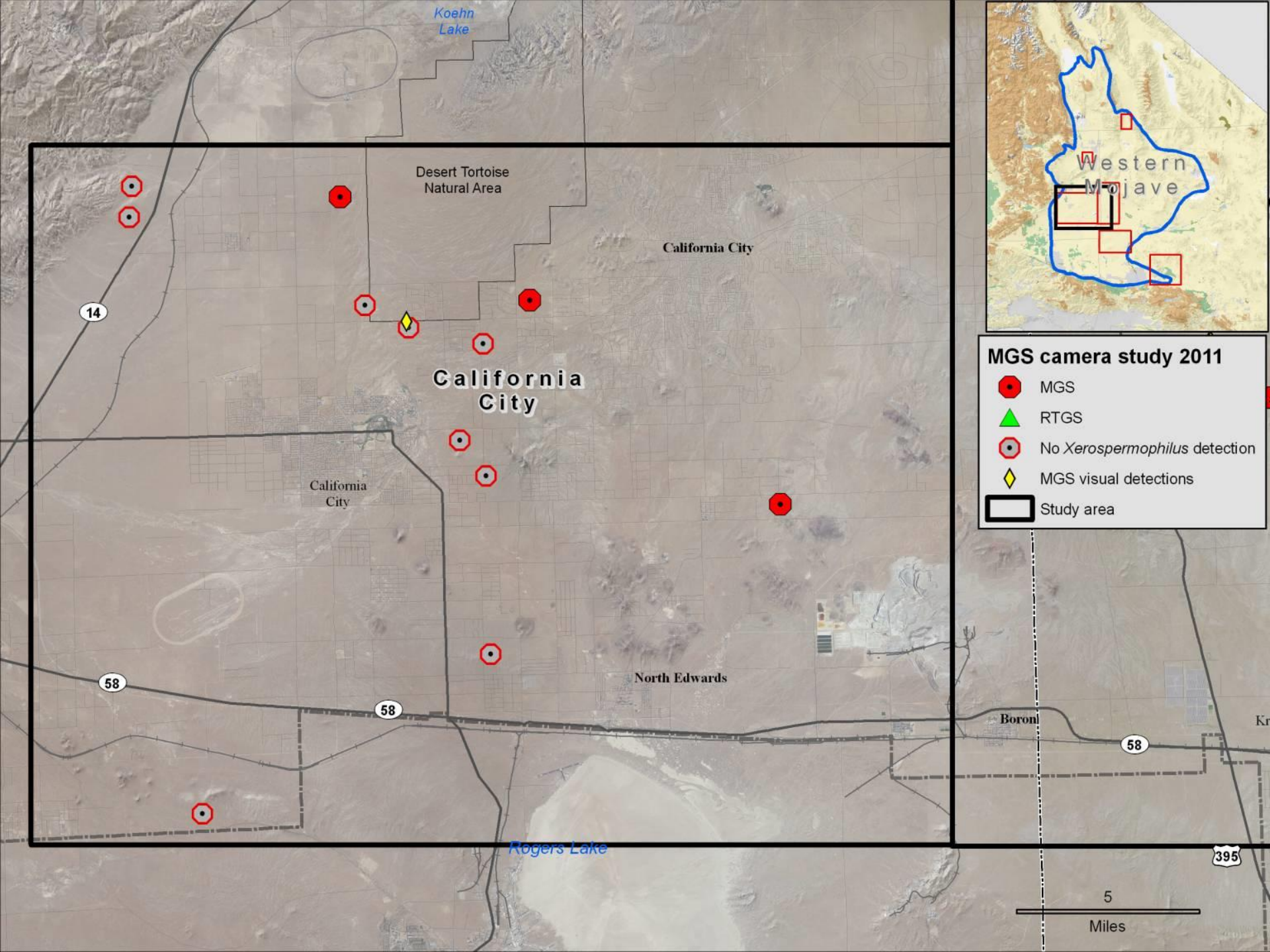
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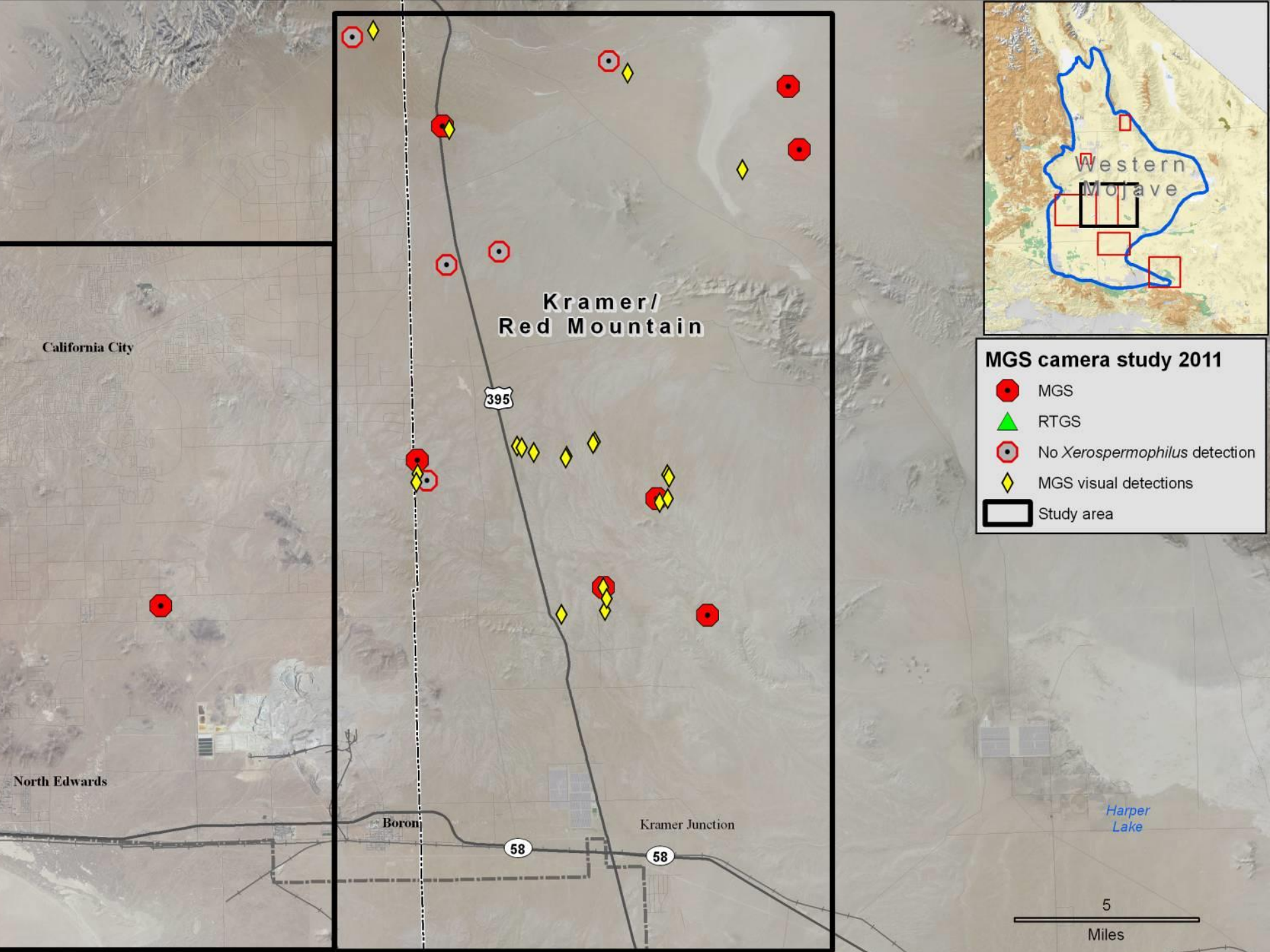
Study area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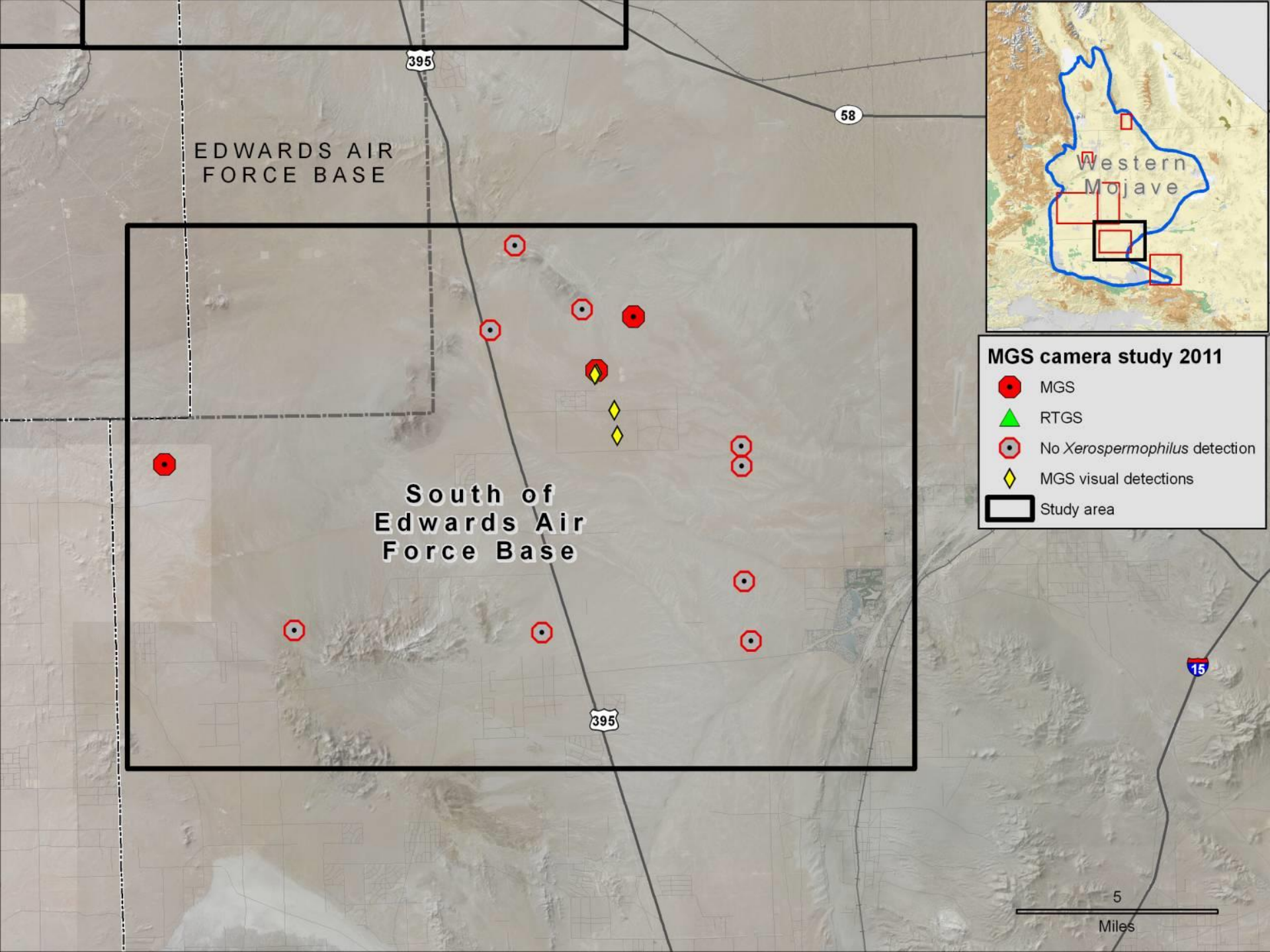
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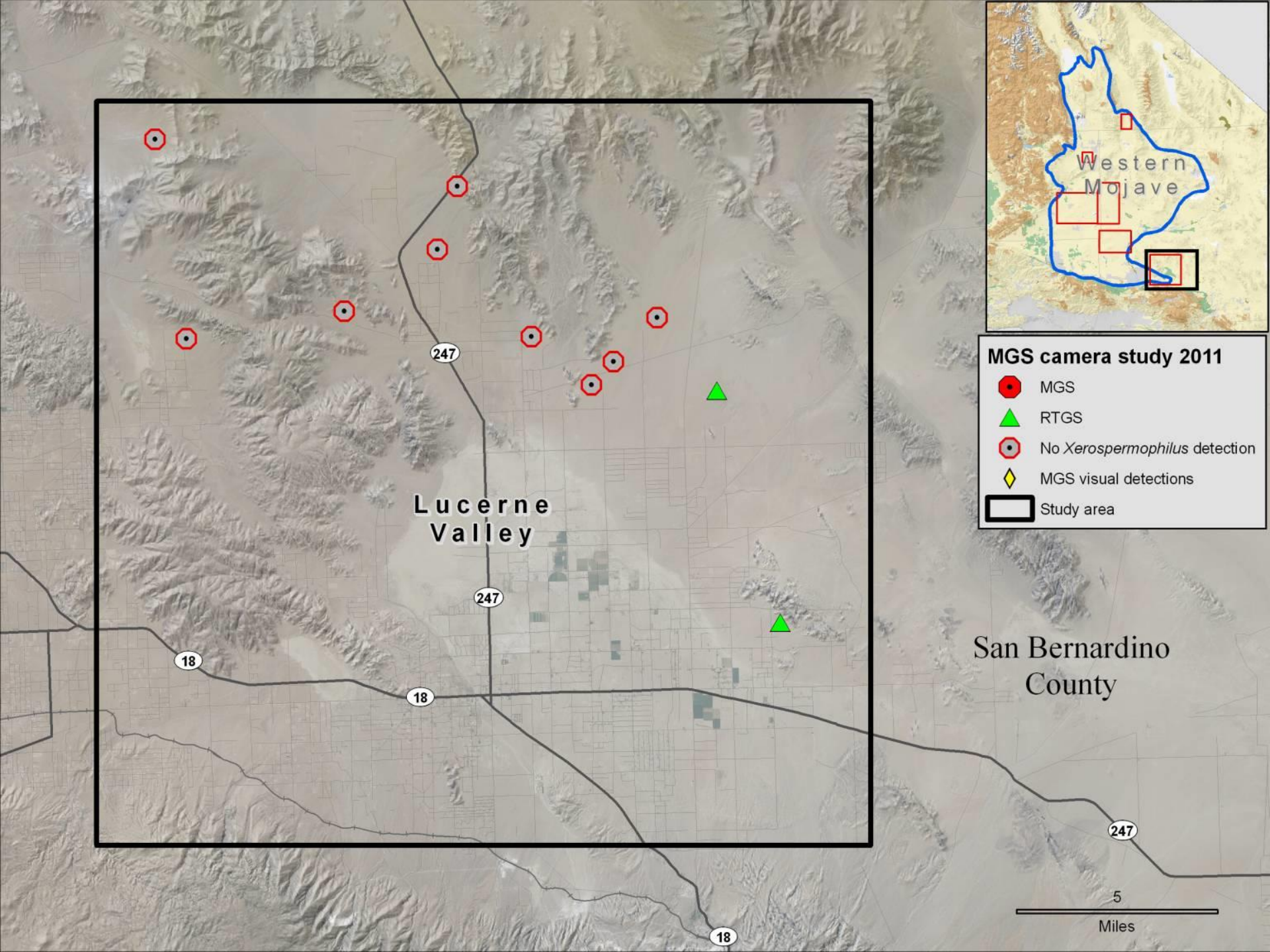
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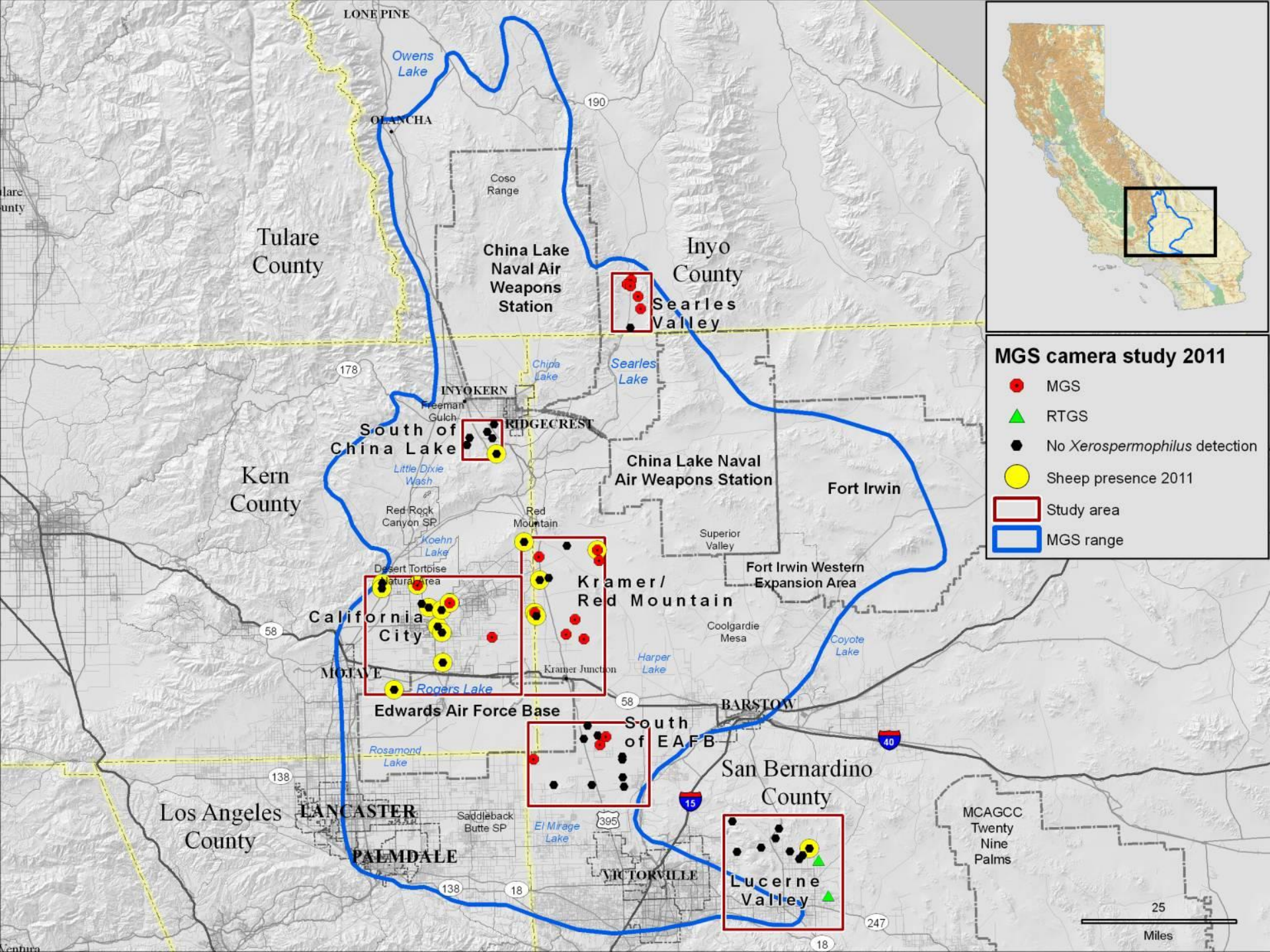
Summary of Preliminary 2011 Camera Trap Results

- 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

Intra-/Interspecific Interactions

Examples of Nocturnal Non-Target Species Detections

Examples of Diurnal Non-Target Species Detections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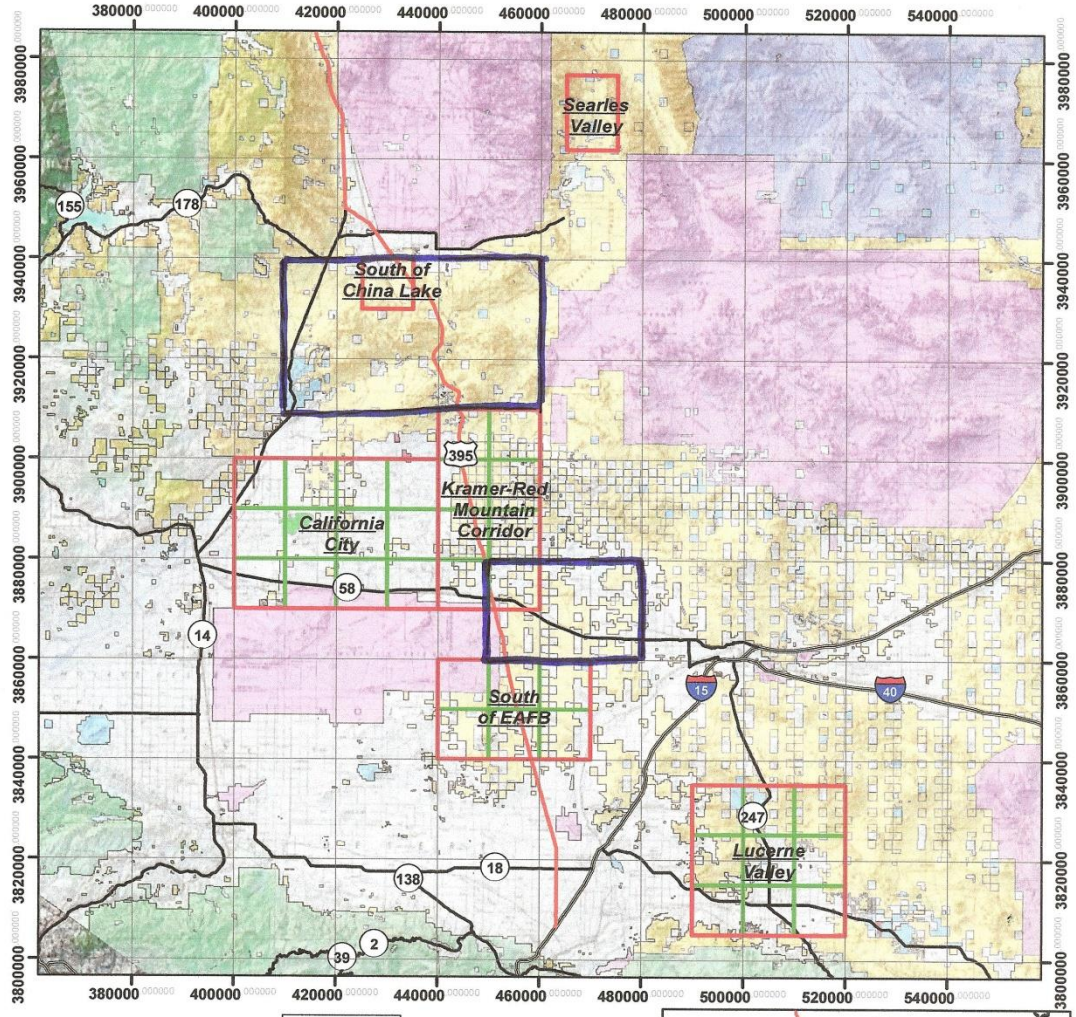
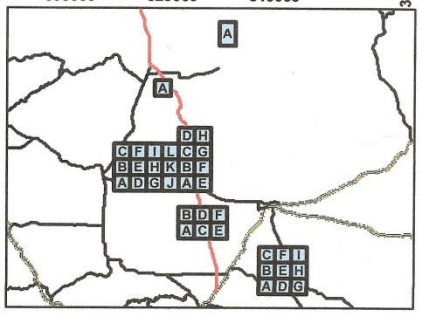


Overview

Mohave Ground Squirrel Survey Locations

Possible 2012 Study Areas



Legend

- Survey Region
- Survey Sub-Region
- INTERSTATE
- US ROUTE
- STATE ROUTE
- BLM
- BOR
- COUNTY OR LOCAL LANDS
- DOD
- DOE
- NATIONAL PARK
- NATIONAL RECREATION AREA
- NATIVE AMERICAN RESERVATION
- PRIVATE
- STATE
- STATE WILDLIFE RESERVE
- UNDESIGNATED
- USFWS WILDLIFE REFUGE
- WILDERNESS AREA

Map Prepared By:

MOJAVE DESERT

Questions?

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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

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