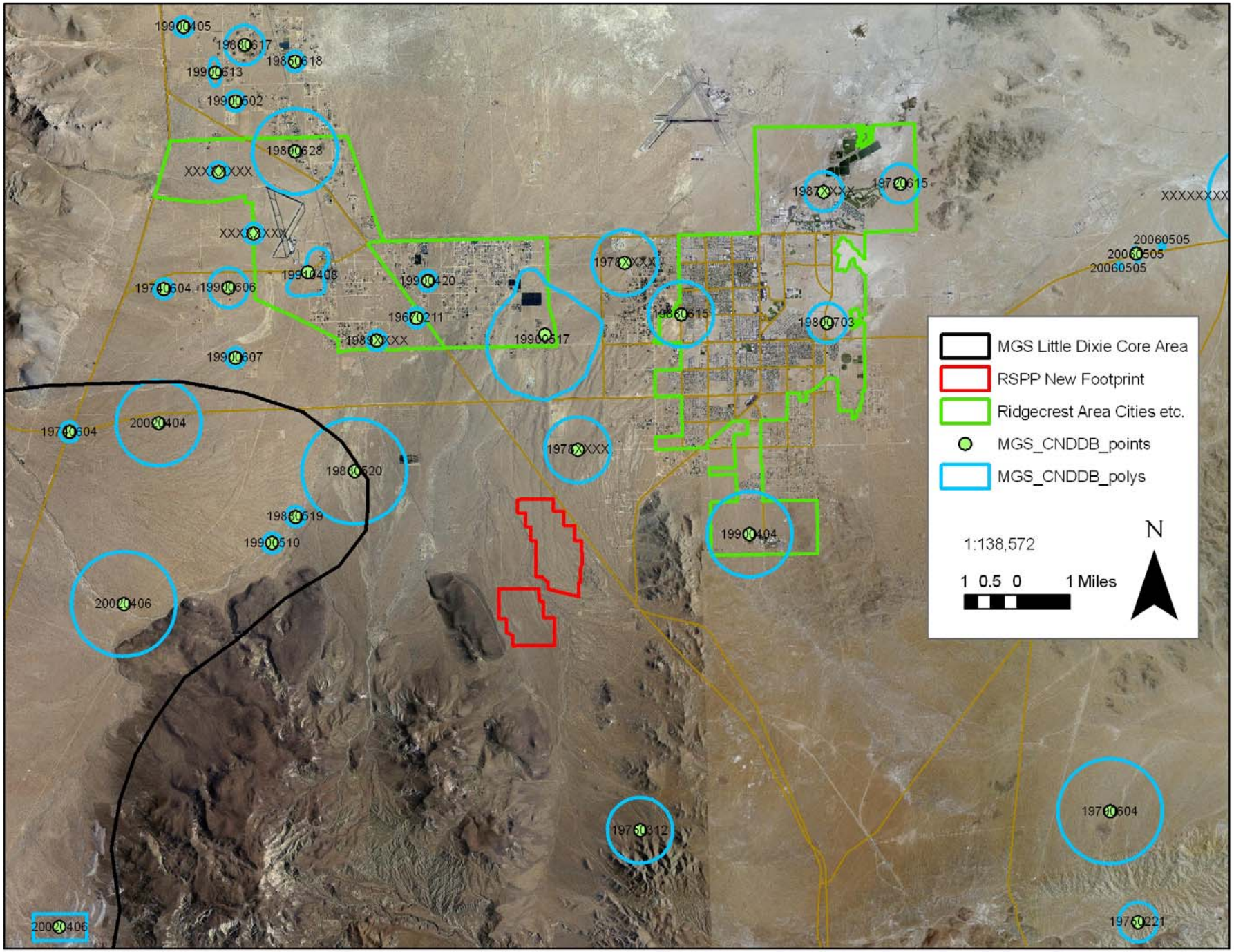
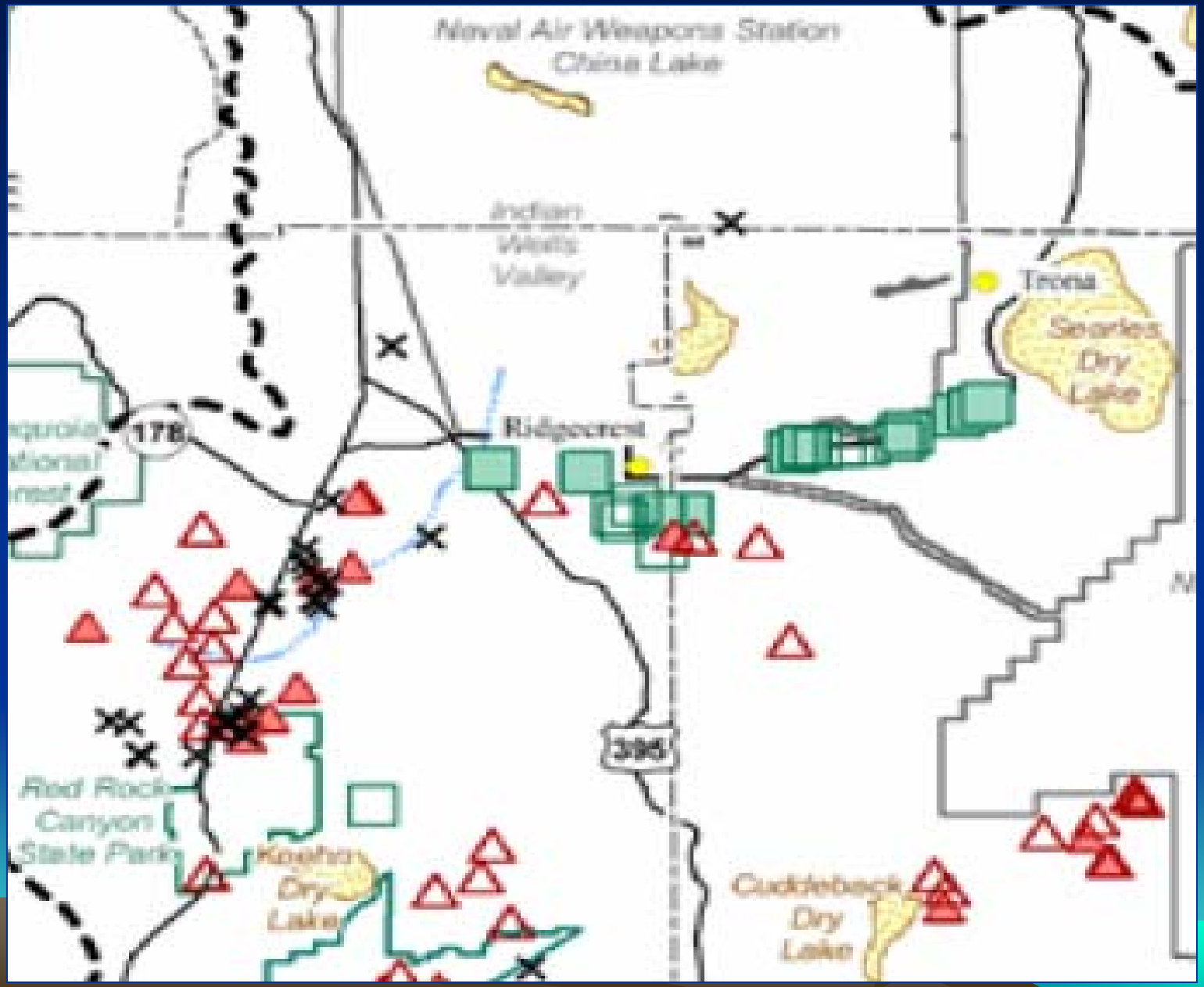
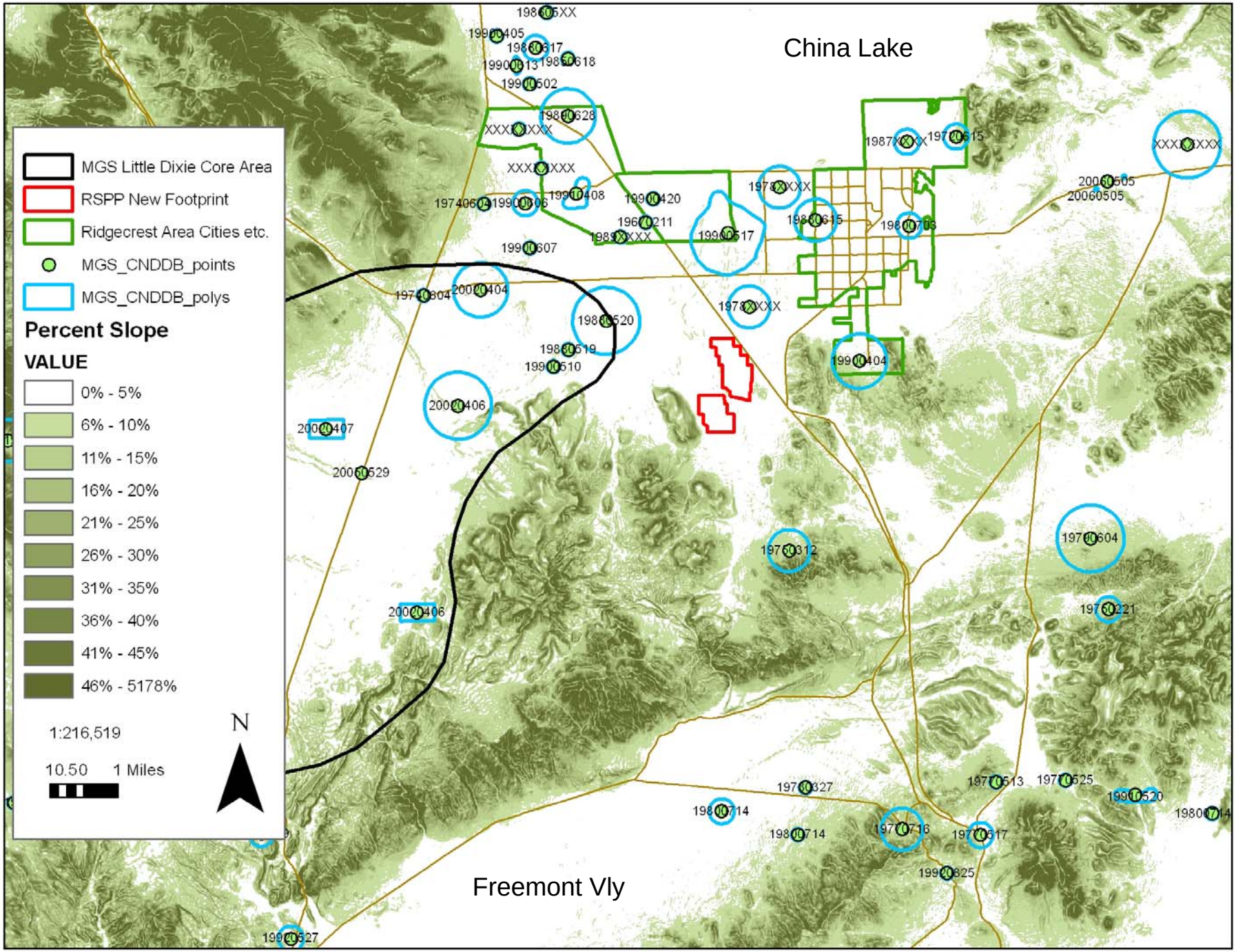
Potential Mohave Ground Squirrel Impacts Solar Millennium Ridgecrest Solar Power Project

Dave Hacker, Staff Environmental Scientist
California Department of Fish and Game
May 4, 2010


MGS Little Dixie Core Area
RSPP New Footprint
Ridgecrest Area Cities etc.
MGS_CNDDB_points
MGS_CNDDB_polys
1:138,572
1 0.5 0 1 Miles
N

From Leitner (2008) “Current Status of the Mohave Ground Squirrel”




China Lake
Freemont Vly
MGS Little Dixie Core Area
RSPP New Footprint
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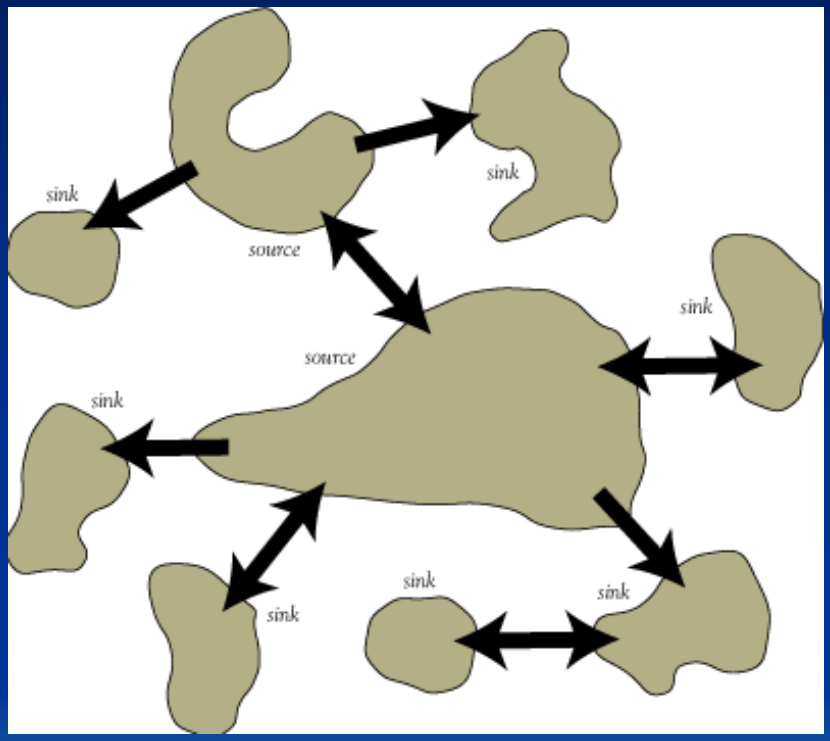
MGS_CNDDB_points
MGS_CNDDB_polys
Percent Slope
VALUE
0% - 5%
6% - 10%
11% - 15%
16% - 20%
21% - 25%
26% - 30%
31% - 35%
36% - 40%
41% - 45%
46% - 5178%
1:216,519
10.50 1 Miles
N

The Importance of Connectivity

- Global extinction usually results by gradual loss of individual populations
- Linkages decrease the chance of both local and global extinction for species by improving movement between populations.
- Connectivity permits ‘rescue effect’ to take place where immigration prevents local extinctions.
- Connectivity allows re-colonization.
- Increases the probability that a species is able to inhabit more patches of habitat at any given time, decreasing the chance that a catastrophe will wipe out all populations.
- Extinction due to genetic drift and inbreeding depression may also be reduced by increasing connectivity.

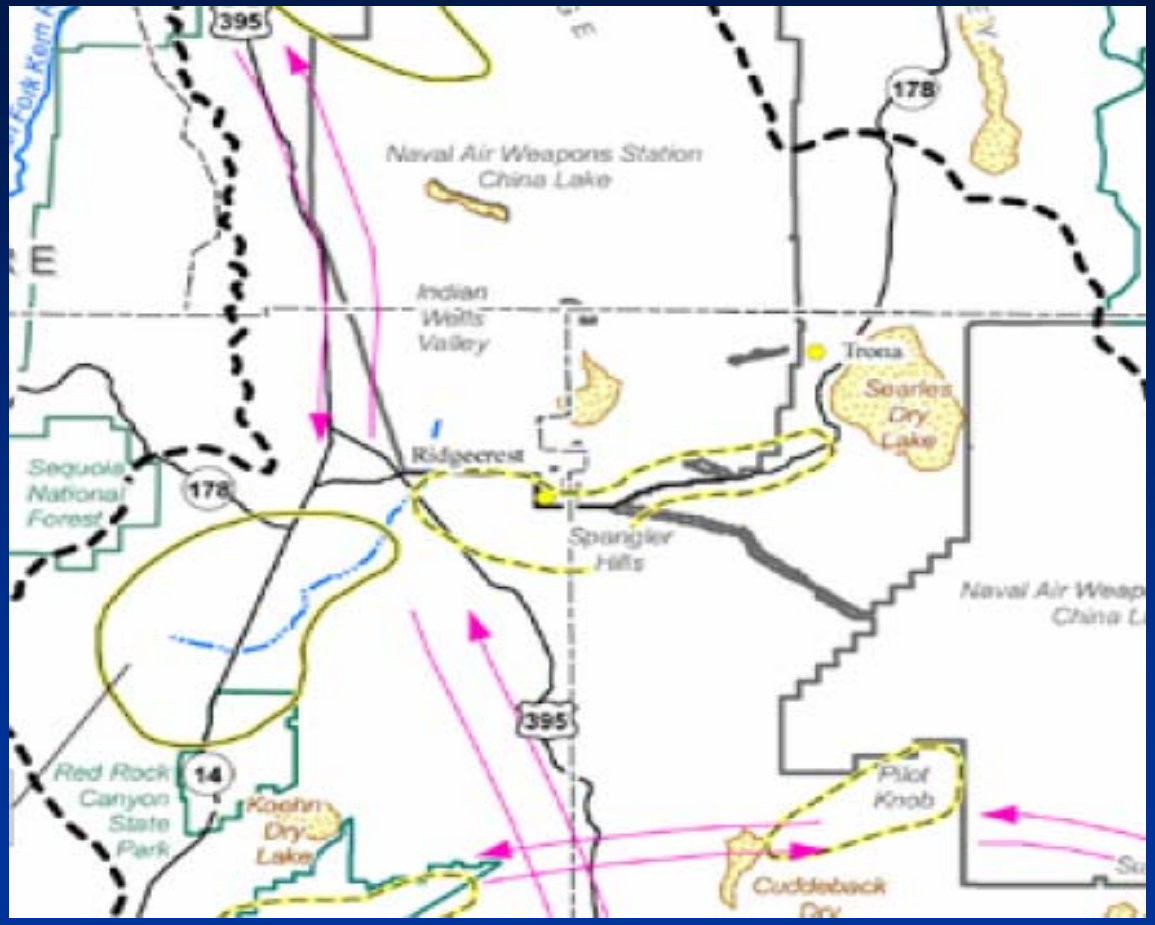
(Hilty et al. 2006).

The Role of the Matrix



"…we compile occupancy data from 1,015 bird, mammal, reptile, amphibian, and invertebrate population networks on 6 continents and show that patch area and isolation are surprisingly poor predictors of occupancy for most species. (Prugh et al. 2008)

"As Prugh and her colleagues conclude in their abstract (**1**), 'Improving matrix quality may lead to higher conservation returns than manipulating the size and configuration of remnant patches for many of the species that persist in the aftermath of habitat destruction.' We agree." (Franklin et al. 2009)



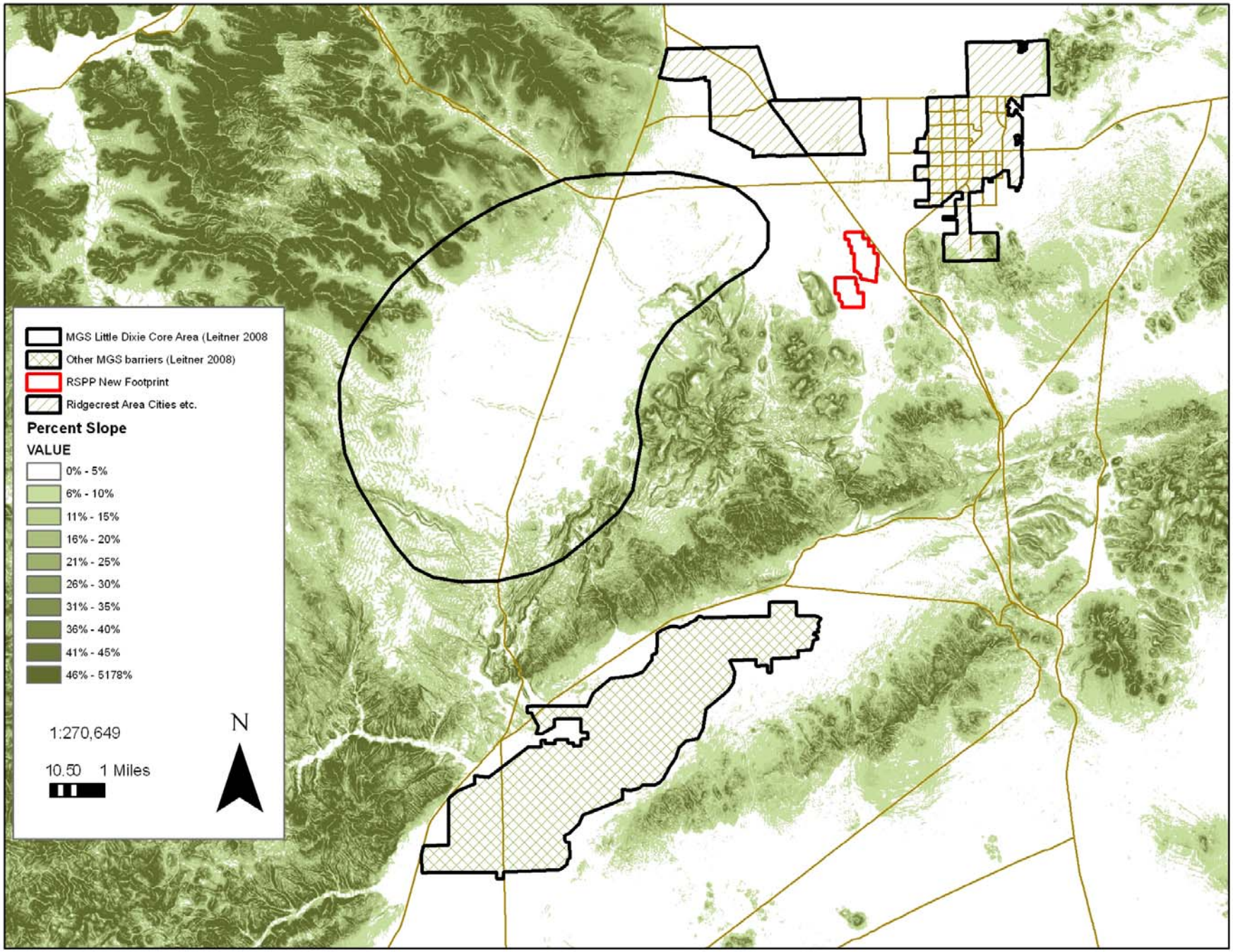
"It will be an important conservation goal to ensure sufficient connectivity between [core areas] to allow gene flow."

"Connectivity between the Little Dixie Wash core area and Edwards Air Force Base is most likely to be achieved by protection of a north-south habitat corridor along US Highway 395."

From Leitner (2008) "Current Status of the Mohave Ground Squirrel"

Is there Population Connectivity Between MGS Core Areas?

UN Reno (Marjorie Matocque) genetics work suggests some isolation of Little Dixie Wash and Coso populations, but also evidence of on-going exchange between all of the groups, including Little Dixie Wash.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Other MGS barriers (Leitner 2008)
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Ridgecrest Area Cities etc.
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11% - 15%
16% - 20%
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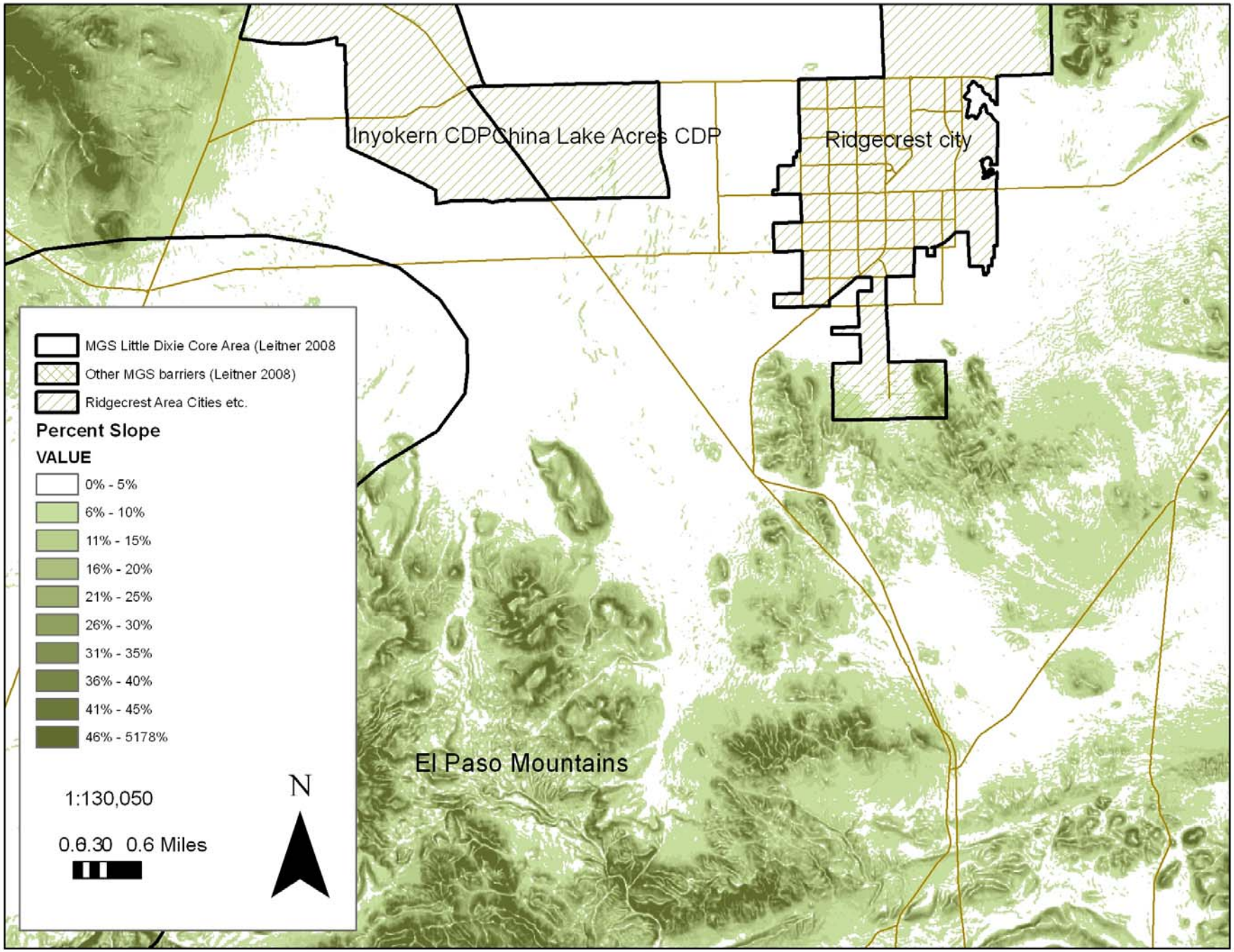
26% - 30%
31% - 35%
36% - 40%
41% - 45%
46% - 5178%
1:270,649
10.50 1 Miles
N


Inyokern CDP
China Lake Acres CDP
Ridgecrest city
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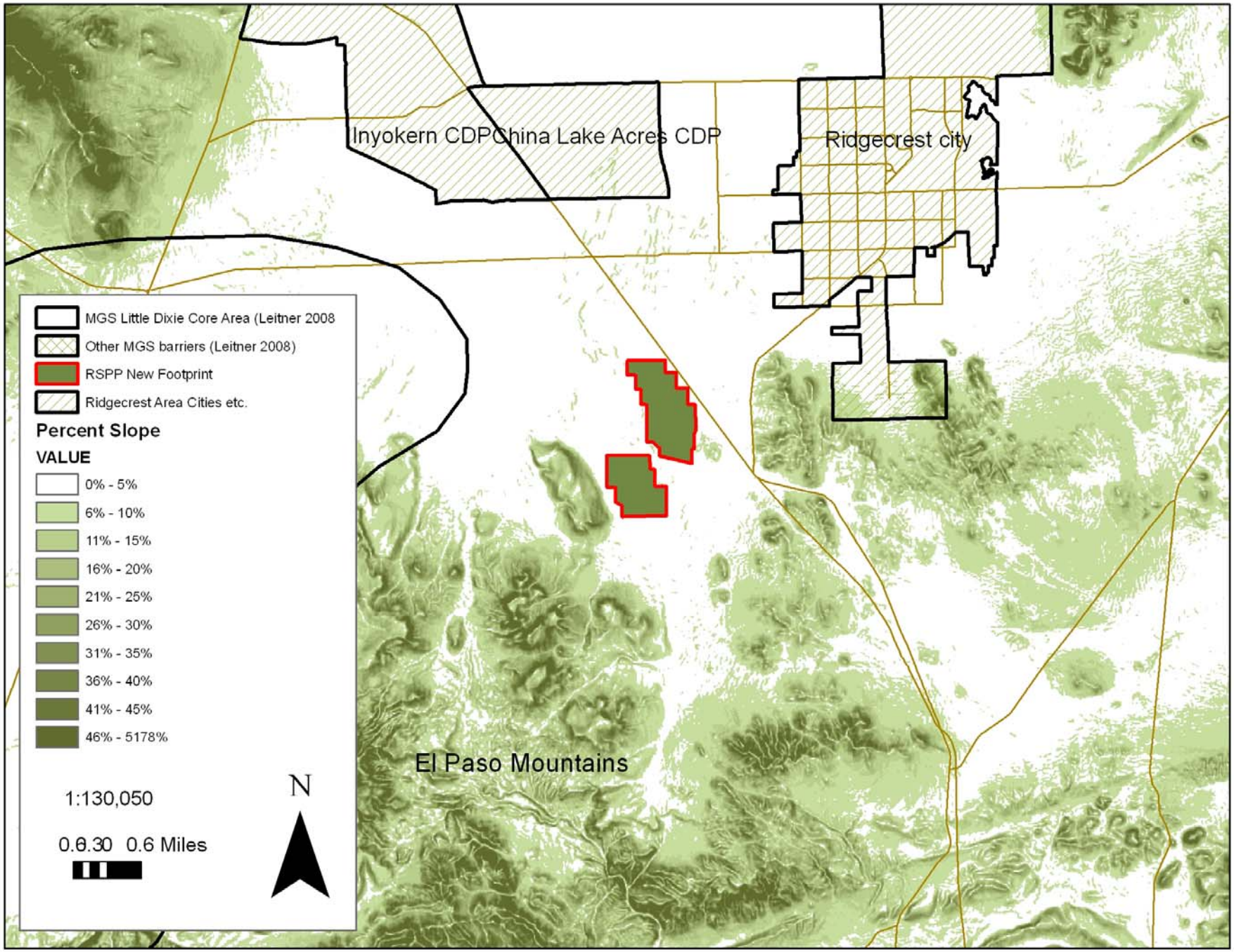
16% - 20%
21% - 25%
26% - 30%
31% - 35%
36% - 40%
41% - 45%
46% - 5178%
1:130,050
0.0 0.30 0.6 Miles
N
El Paso Mountains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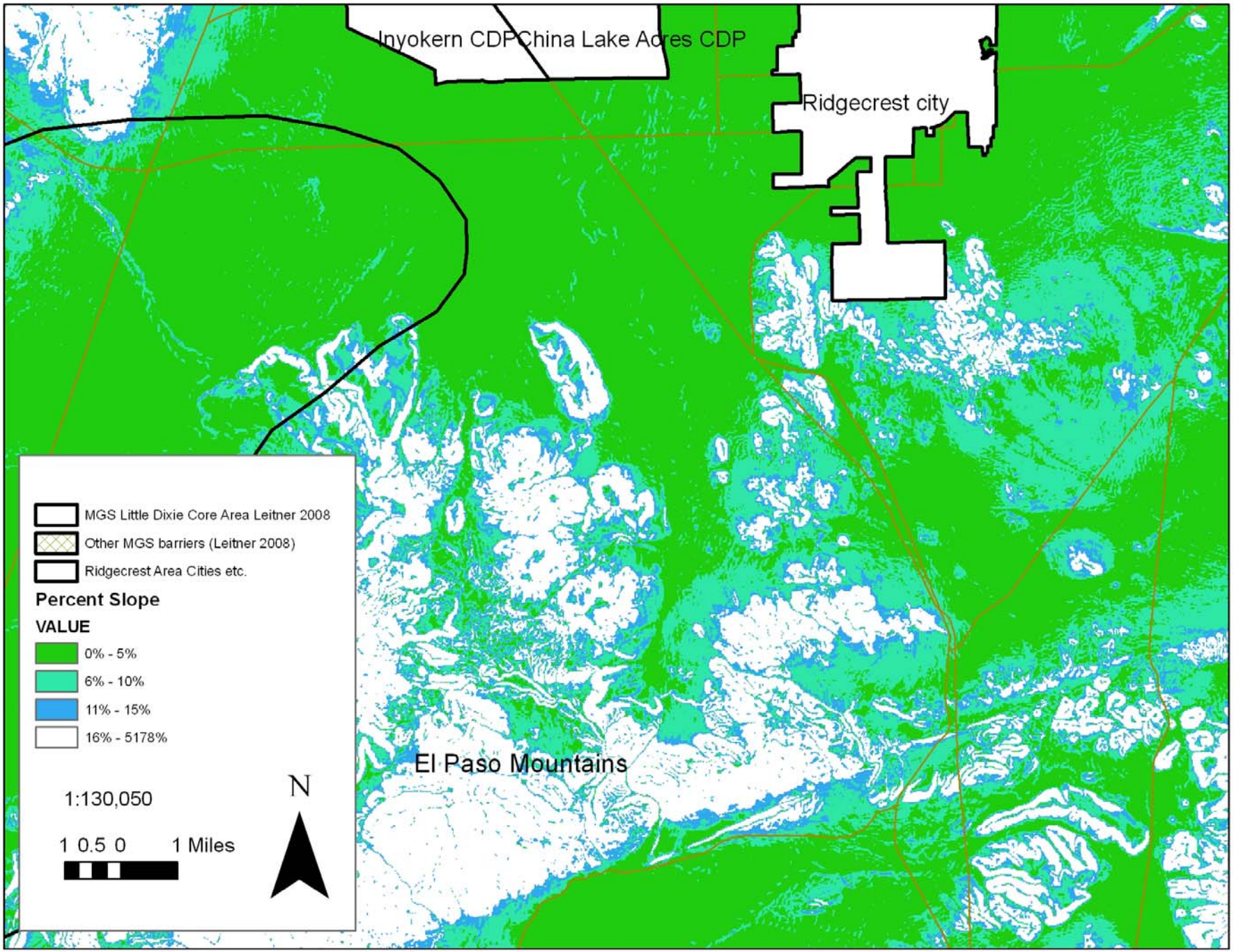
1:130,050
0.0 0.30 0.6 Miles
N
El Paso Mountains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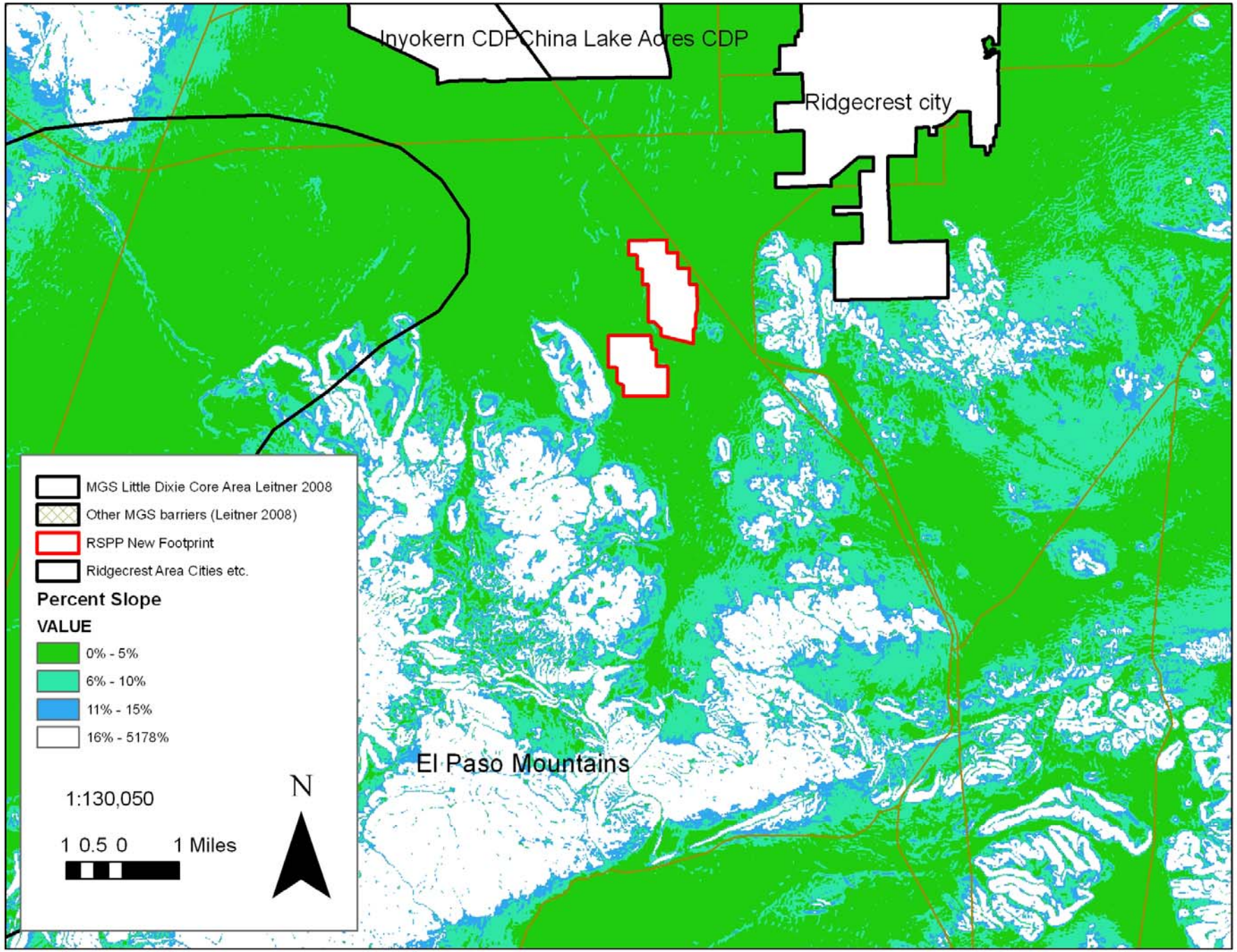
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China Lake Acres CDP
Ridgecrest city
El Paso Mountains
MGS Little Dixie Core Area Leitner 2008
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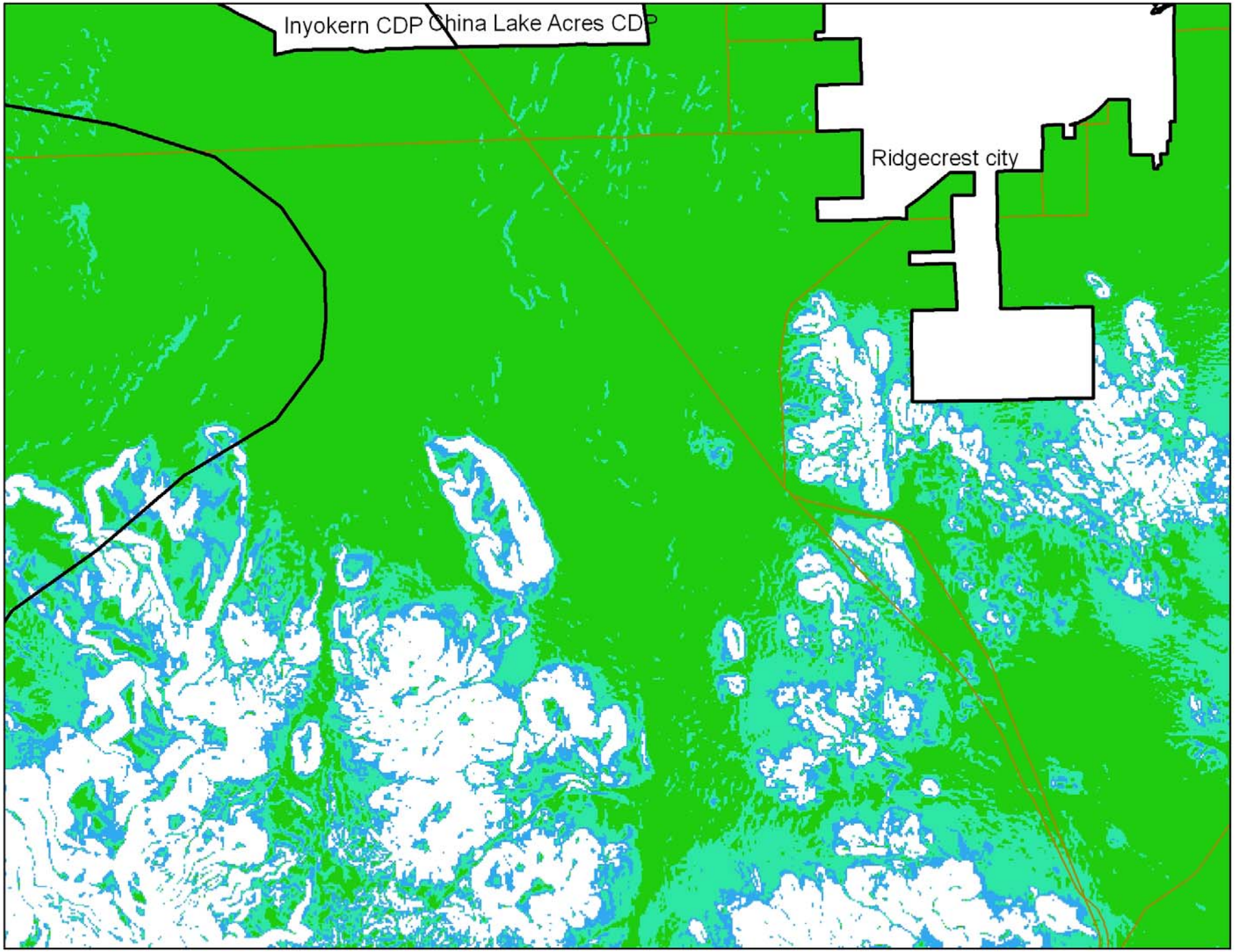
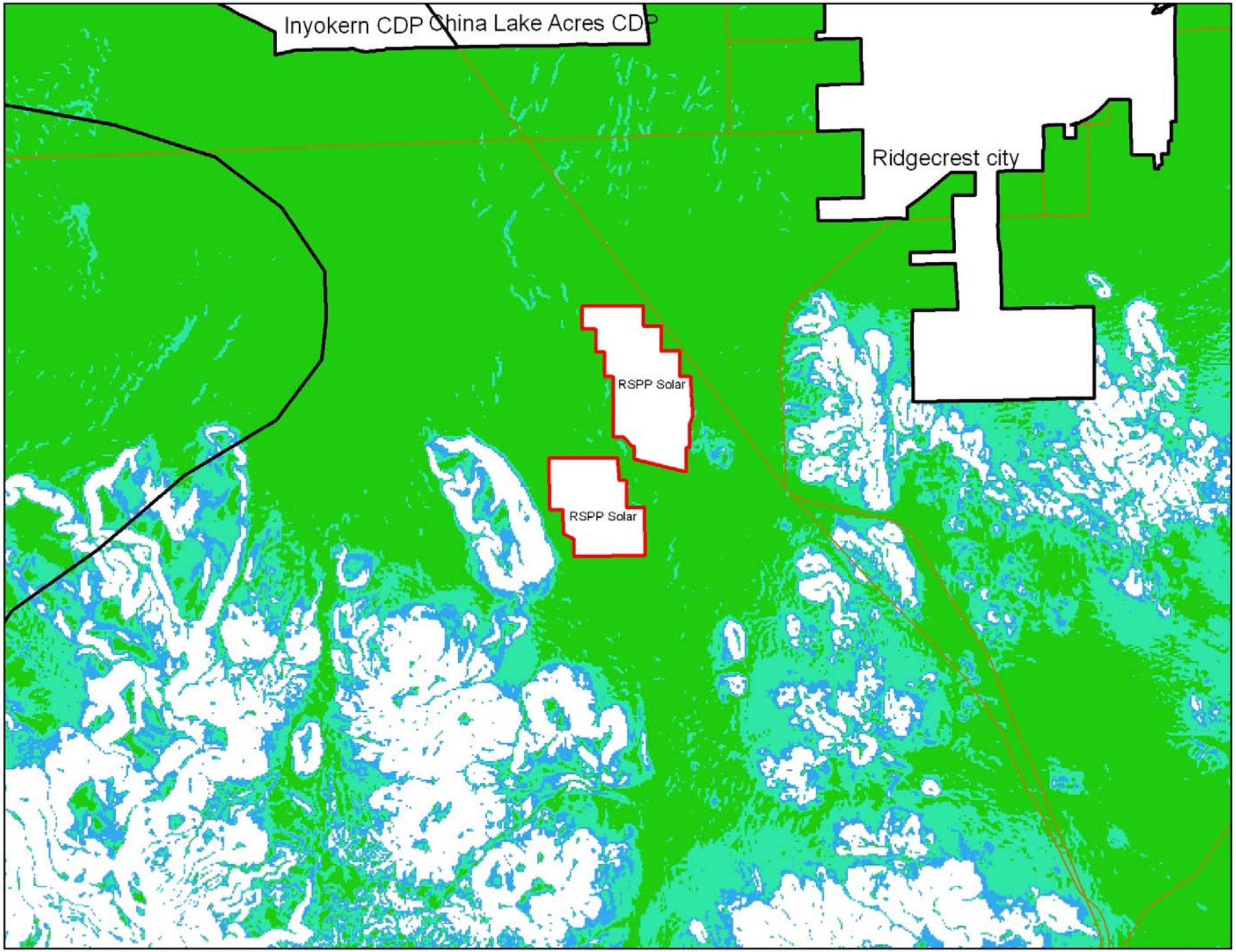
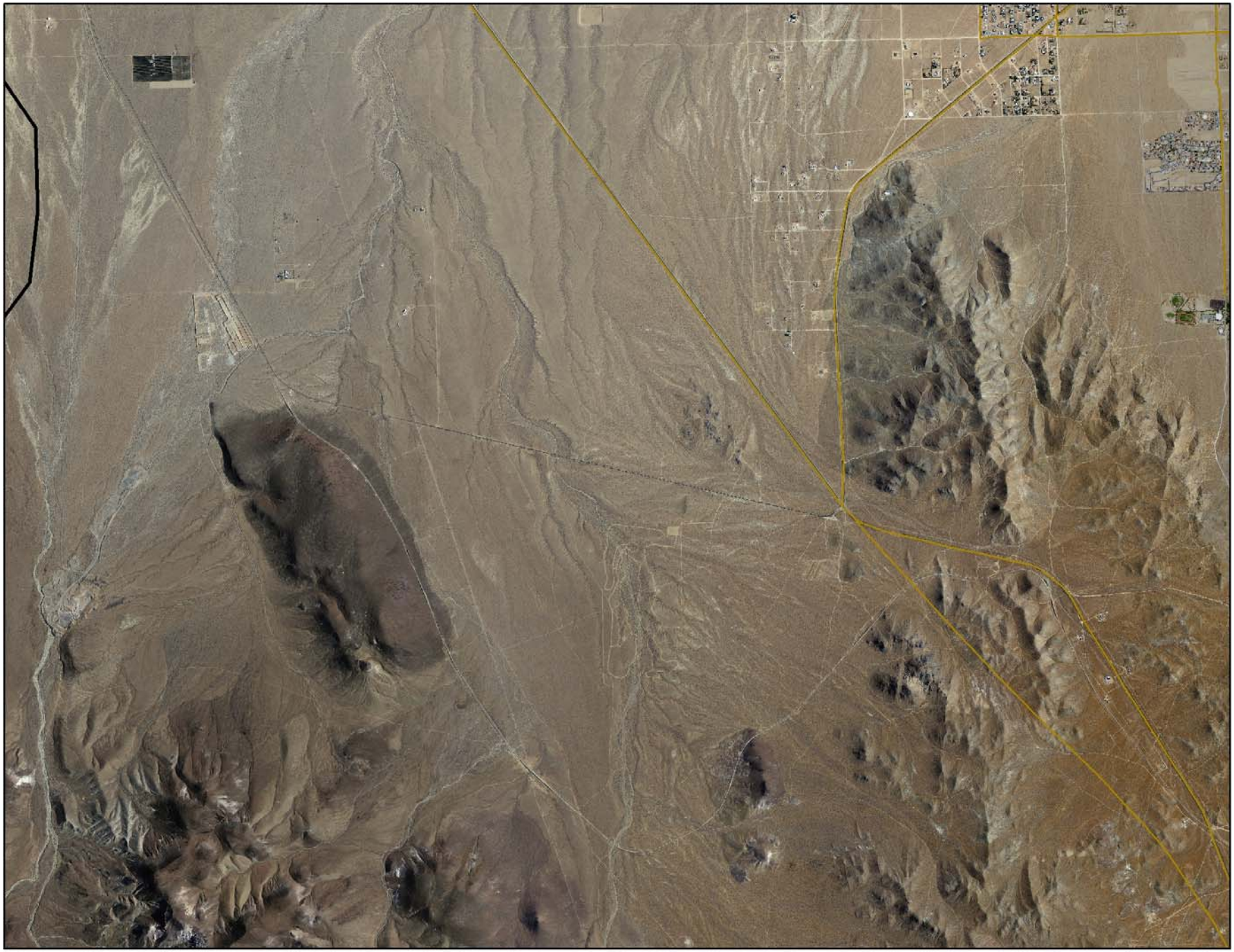
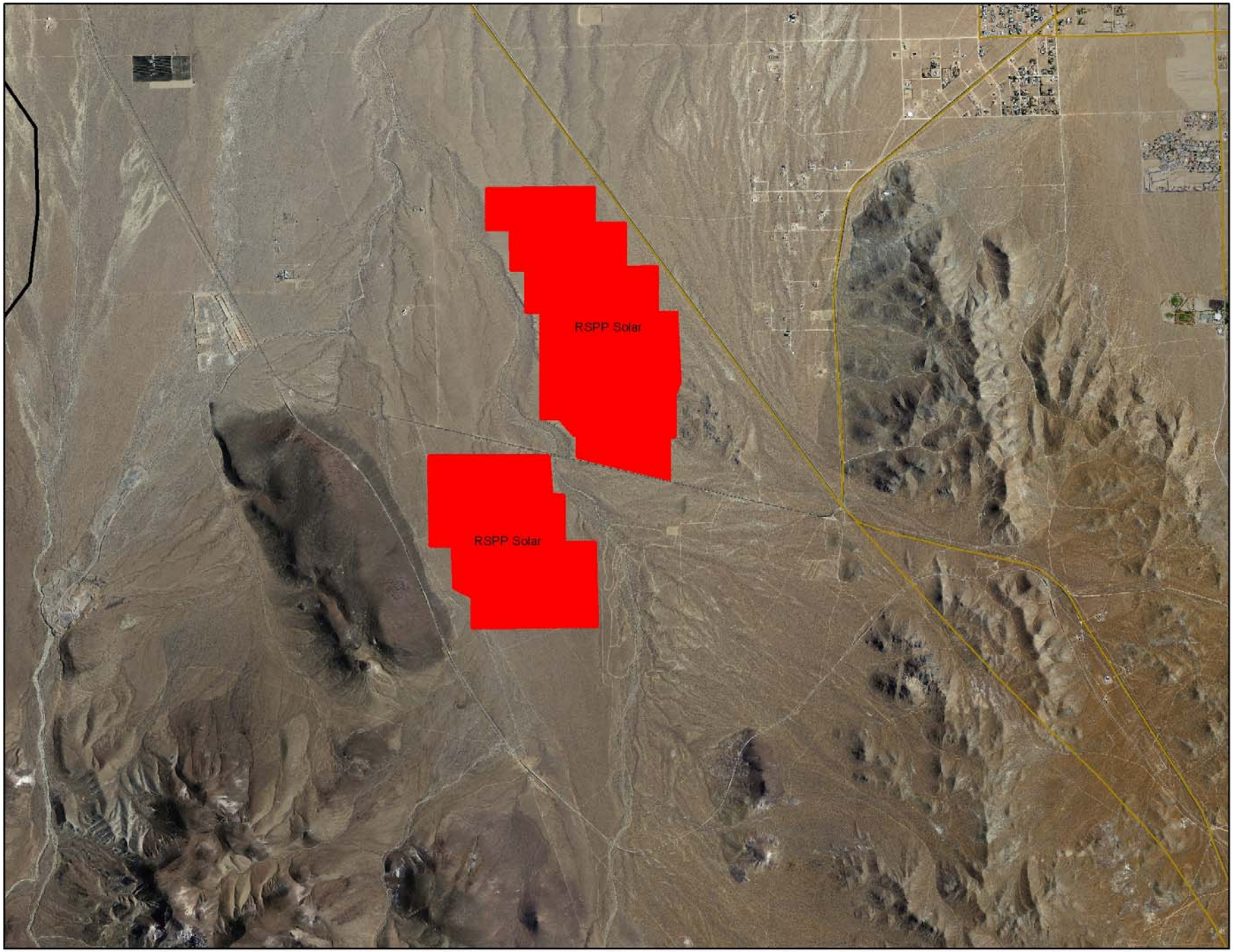

Inyokern CDP
China Lake Acres CDP
Ridgecrest city


Inyokern CDP
China Lake Acres CDP
Ridgecrest city
RSPP Solar
RSPP Solar




RSPP Solar
RSPP Solar

CESA Requires Full Mitigation

- How can we replace the connectivity function that this site provides?
- Leitner (2008) ID's this specific area to connect Little Dixie Wash to other populations.
- That recommendation was based in sound, widely-accepted conservation biological principles.

Literature Cited

Franklin, J.F. and D.B. Lindenmayer. 2009. Importance of matrix habitats in maintaining biological diversity. Proceedings of the National Academy of Sciences 106:234-350.

Hilty, J.A., W.Z. Lidicker Jr., A.M. Merenlender. 2006. Corridor Ecology; the Science and Practice of Linking Landscapes for Biodiversity Conservation. Island Press, USA.

Leitner, P. 2008. Current status of the Mohave ground squirrel. Transactions of the Western Section of the Wildlife Society 44:11-29.

Prugh, L.R., K.E. Hodges, A.R.E. Sinclair, and J.S. Brashares. 2008. Effect of habitat area and isolation on fragmented animal populations. Proceedings of the National Academy of Sciences 105:20770-20775.