Ecosystem Modeling Efforts at Edwards Air Force Base

Air Force Flight Test Center

Environmental Management Directorate

Robert W. Wood

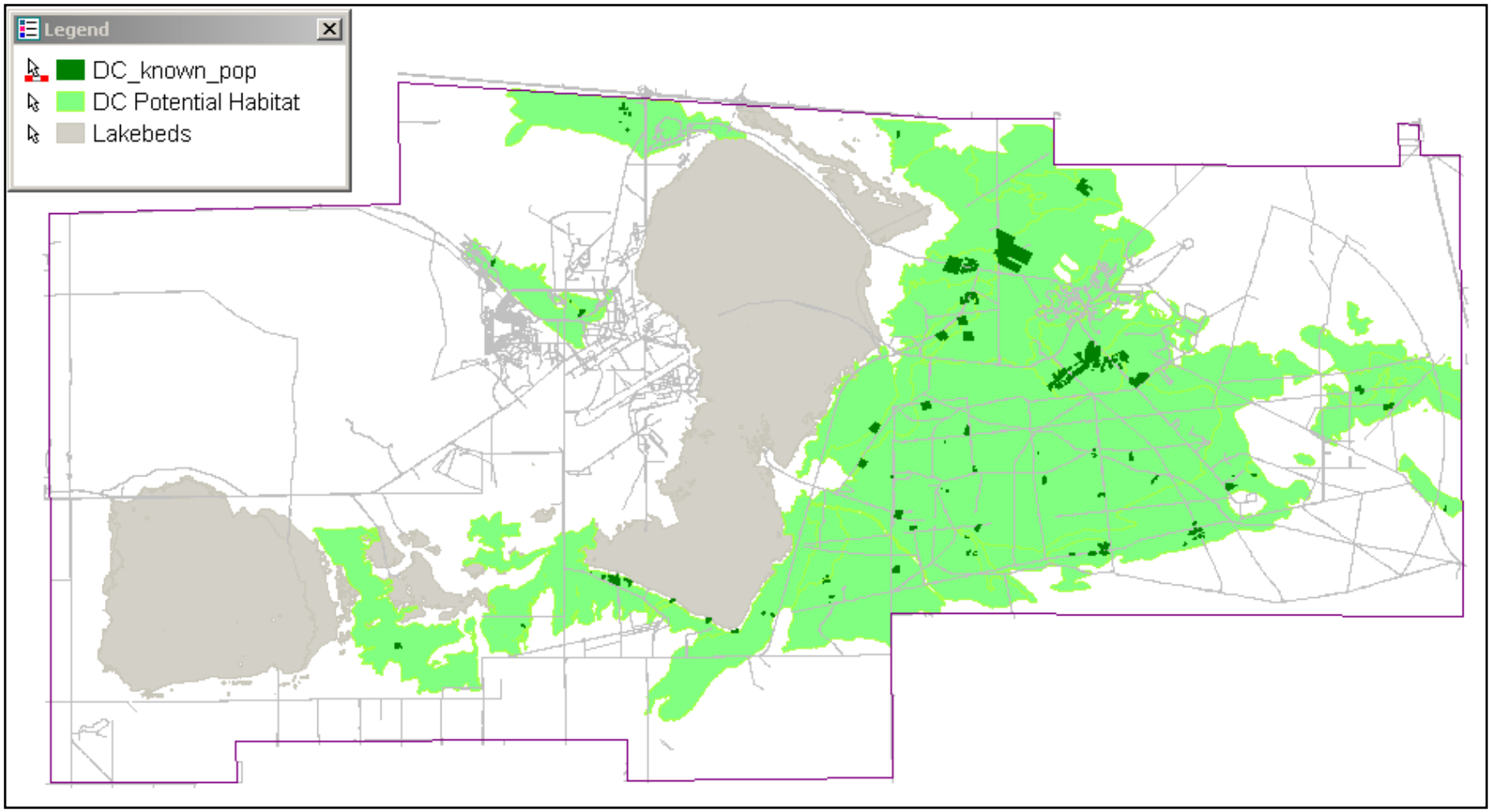
Desert Cymopterus
(Cymopterus deserticola)
Predictive Habitat Modeling

AFFTC Environmental Management Directorate

Predicted Habitat Using Existing GIS Data

- Utilized desert cymopterus known locations
  - Determined habitat parameters
  - Conducted a Geographic Information System (GIS) Spatial analysis
  - Delineated potential habitat
    - Limiting factor is soil type
    - Soil depth

Desert Cymopterus Predicted Habitat



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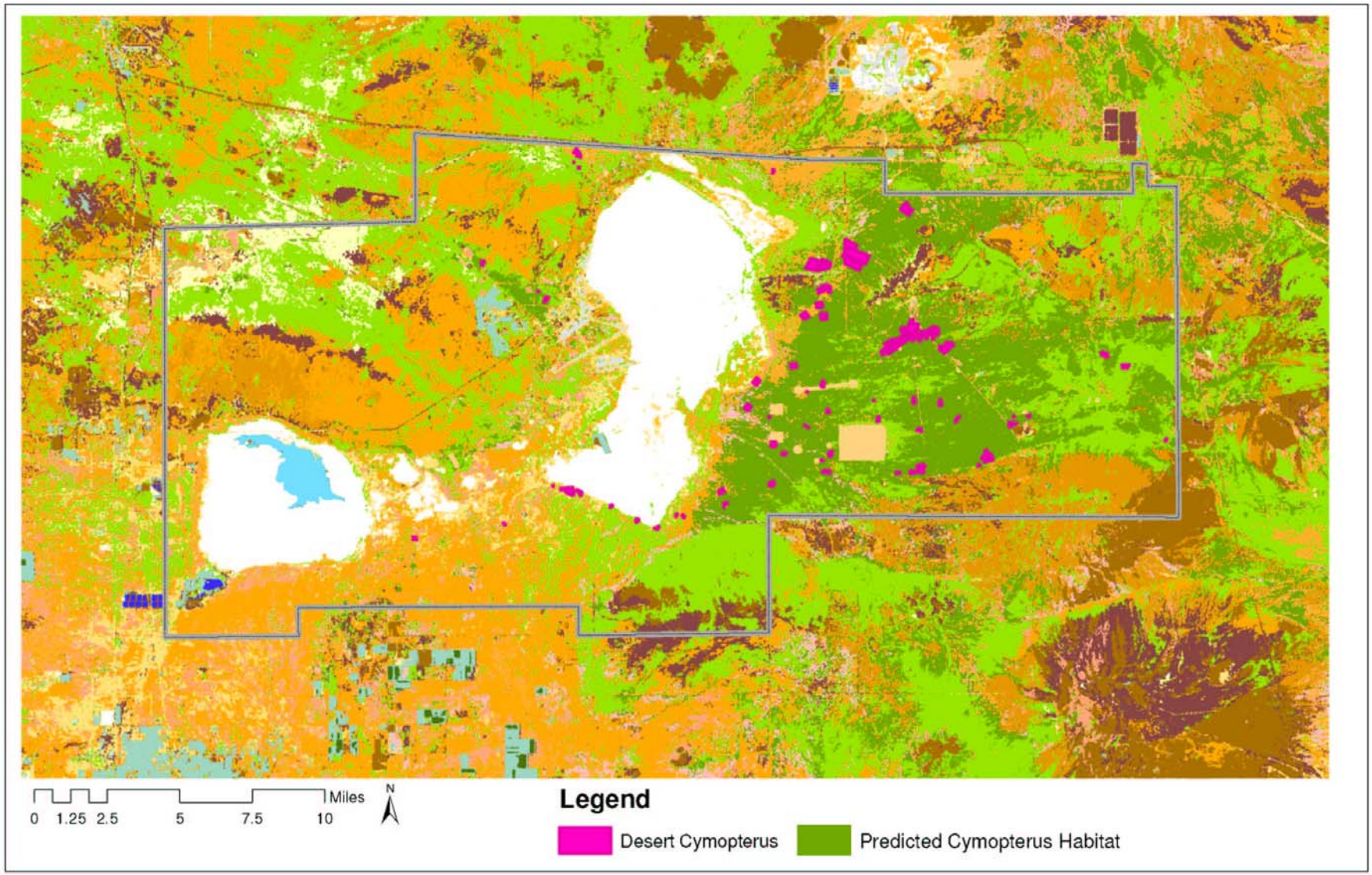
Desert Cymopterus Predicted Habitat using LANDSAT Imagery

- 30-meter LANDSAT imagery
  - Compared to existing GIS soil layer
  - Developed from a 7-layer multi-spectral image
  - Classified using ERDAS Imagine
- Potential habitat up to five miles outside of the Base boundary

Supervised Classification of LANDSAT Image



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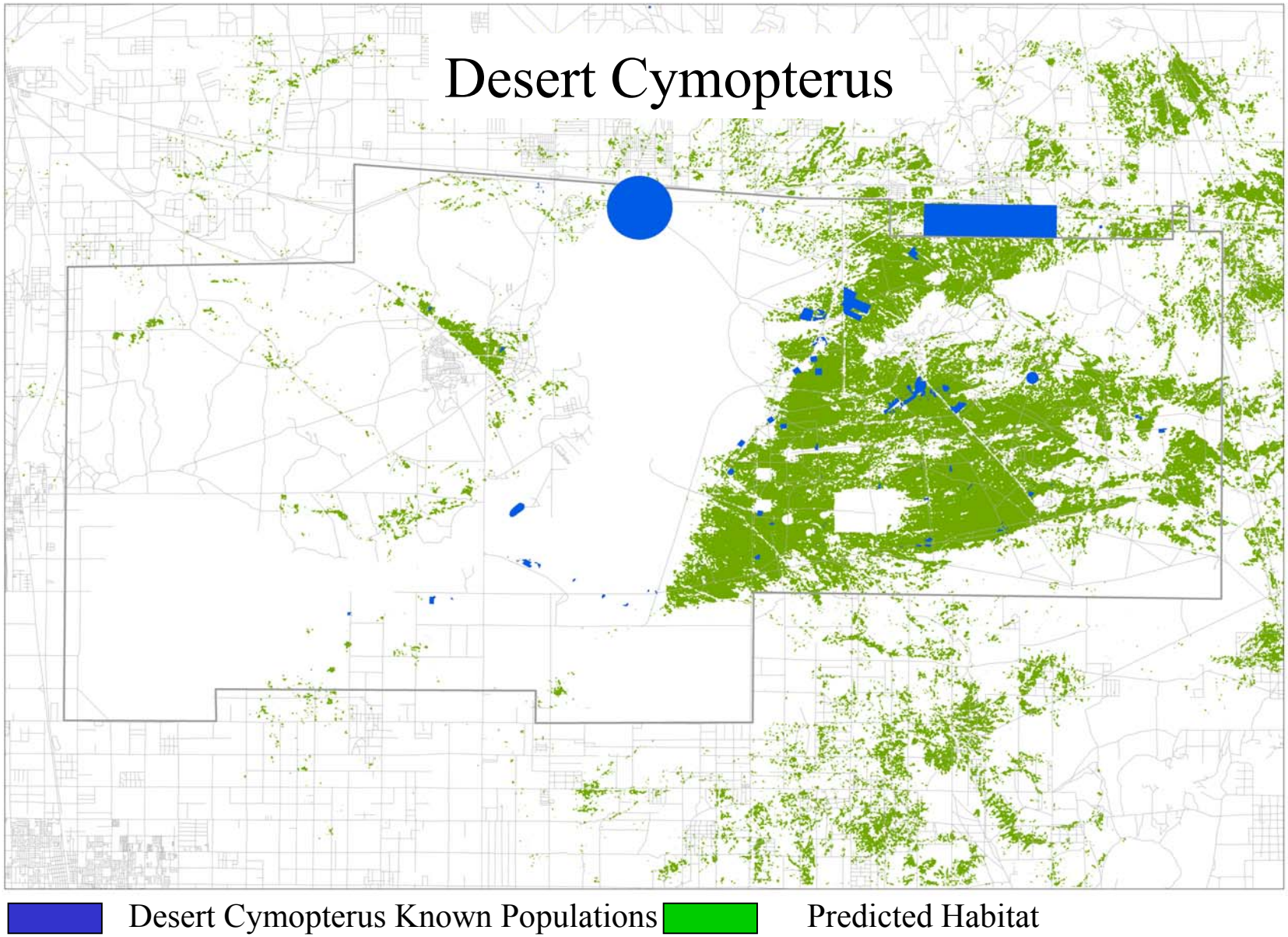
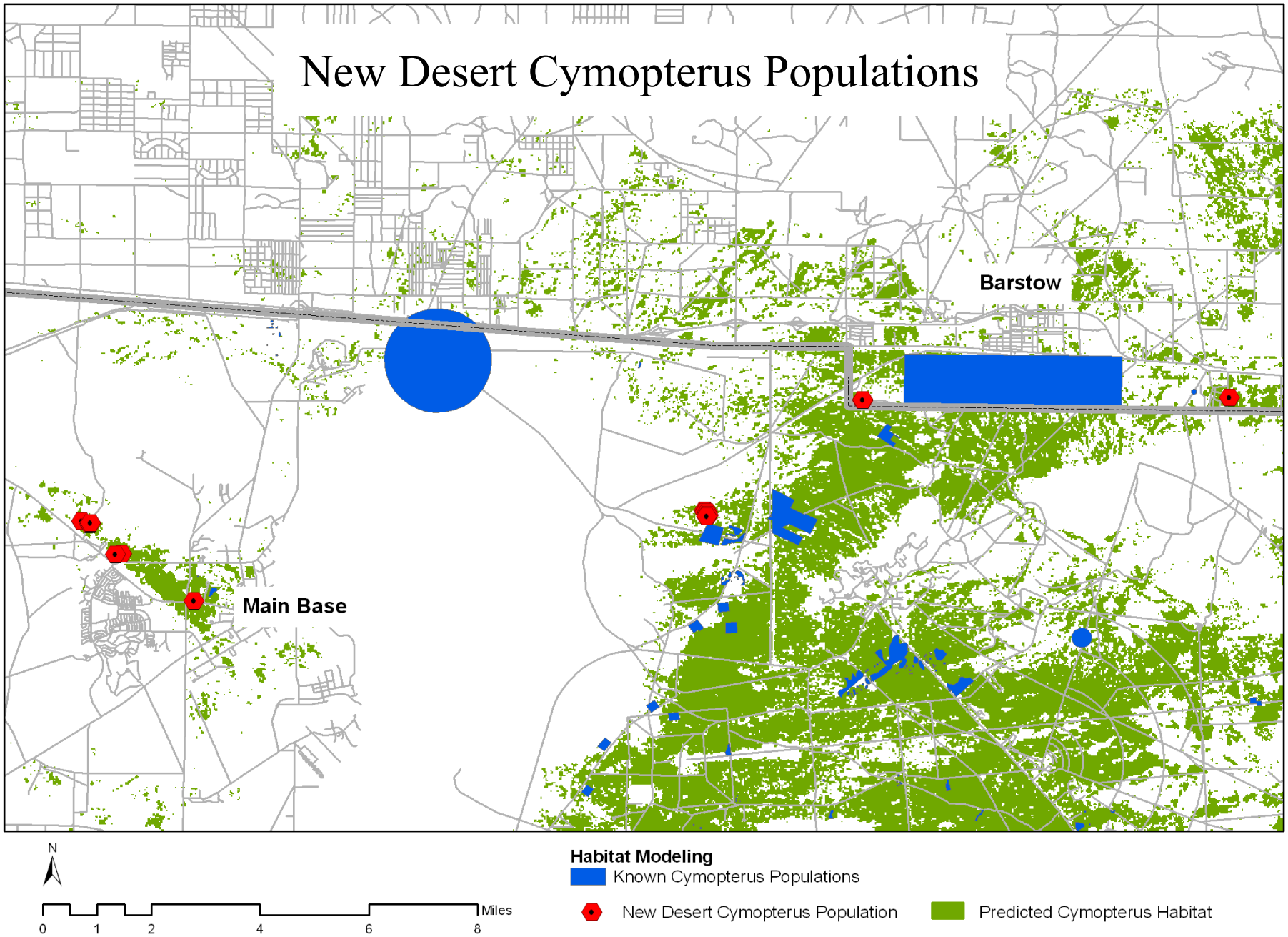
Reclassified LANDSAT Image




New Desert Cymopterus Populations
Barstow
Main Base
N
0
1
2
4
6
8
Miles
Habitat Modeling
Known Cymopterus Populations
New Desert Cymopterus Population
Predicted Cymopterus Habitat

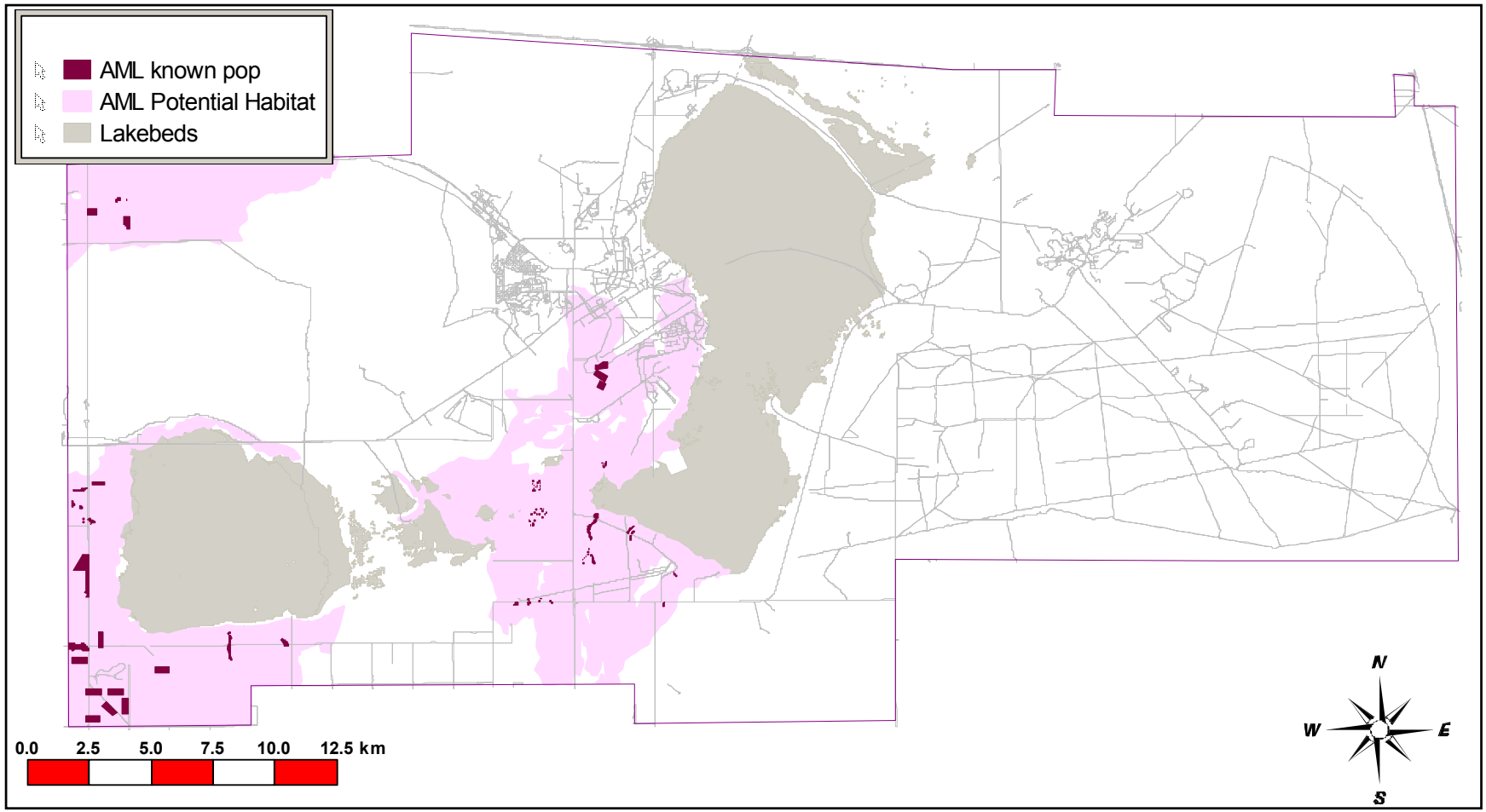
Alkali Mariposa Lily
(Calochortus striatus)
Predictive Habitat Modeling

AFFTC Environmental Management Directorate

Predicted Habitat Using Existing GIS Data

- Utilized Alkali Mariposa Lily known locations
  - –Determined habitat parameters
  - –Conducted a GIS Spatial analysis
  - –Delineated potential habitat
    - Limiting factor is soil type
    - Seasonally inundated drainage channels

Alkali Mariposa Lily Predicted Habitat



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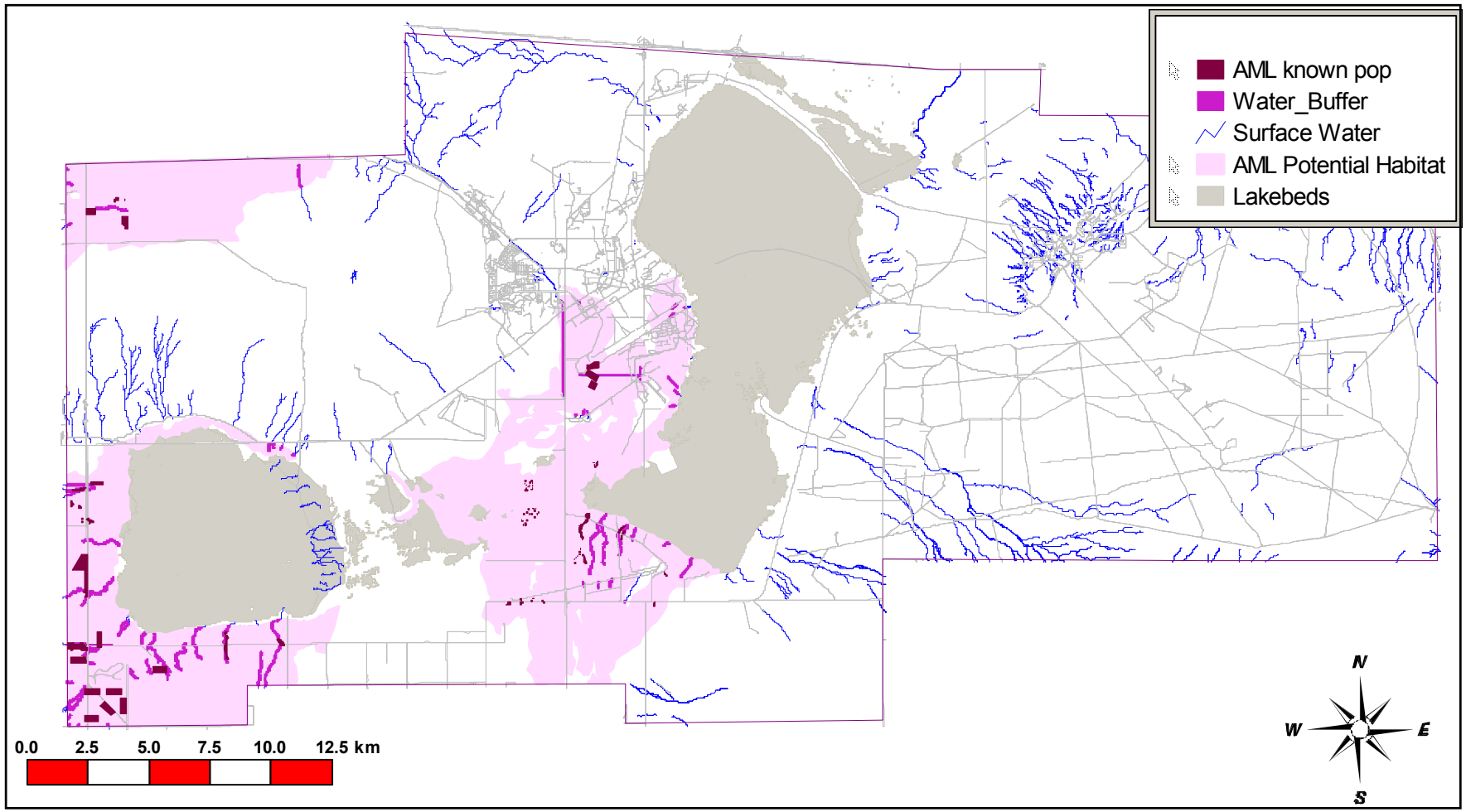
Alkali Mariposa Lily Predicted Habitat

Showing Seasonally Inundated Channels



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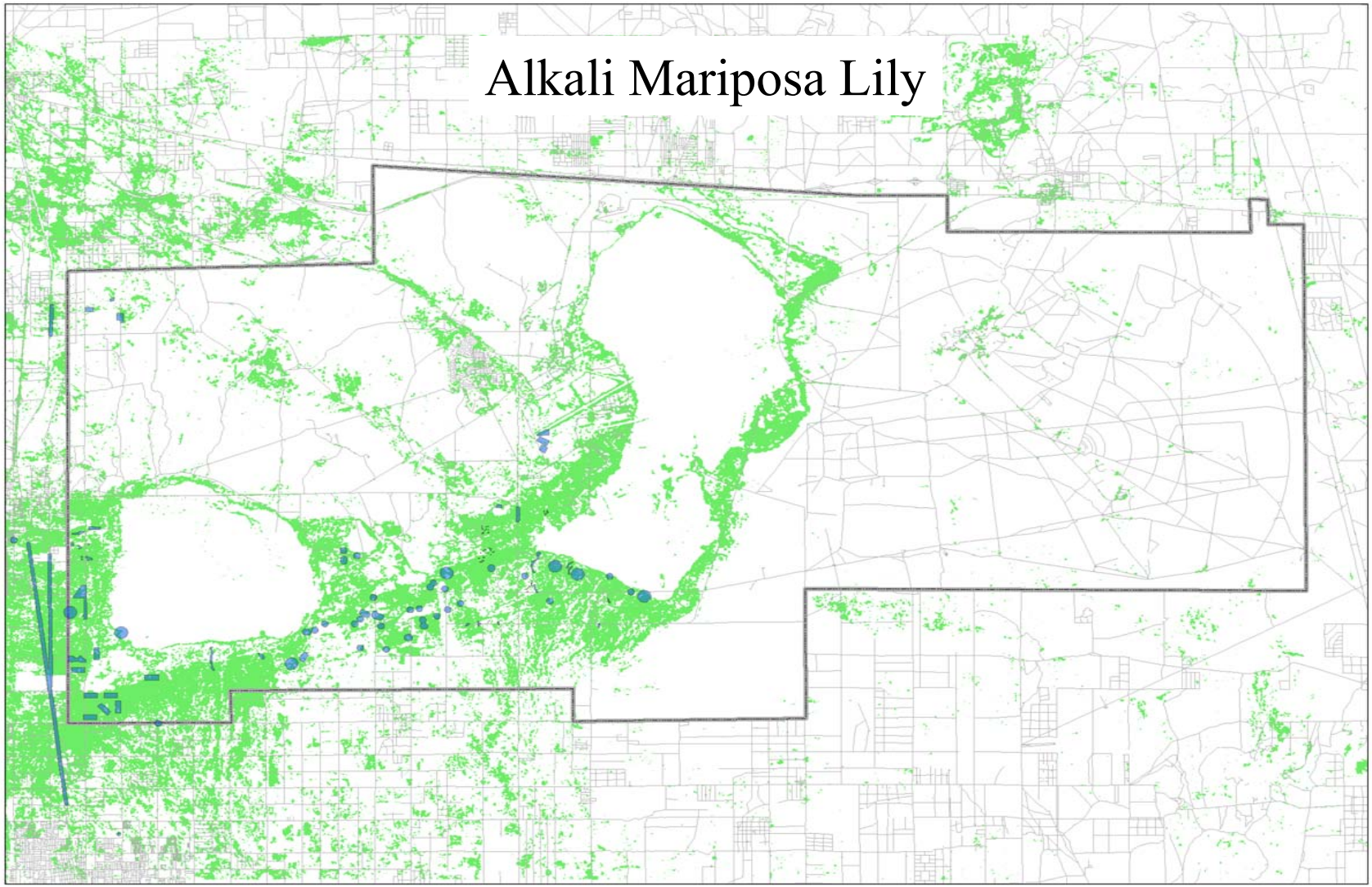
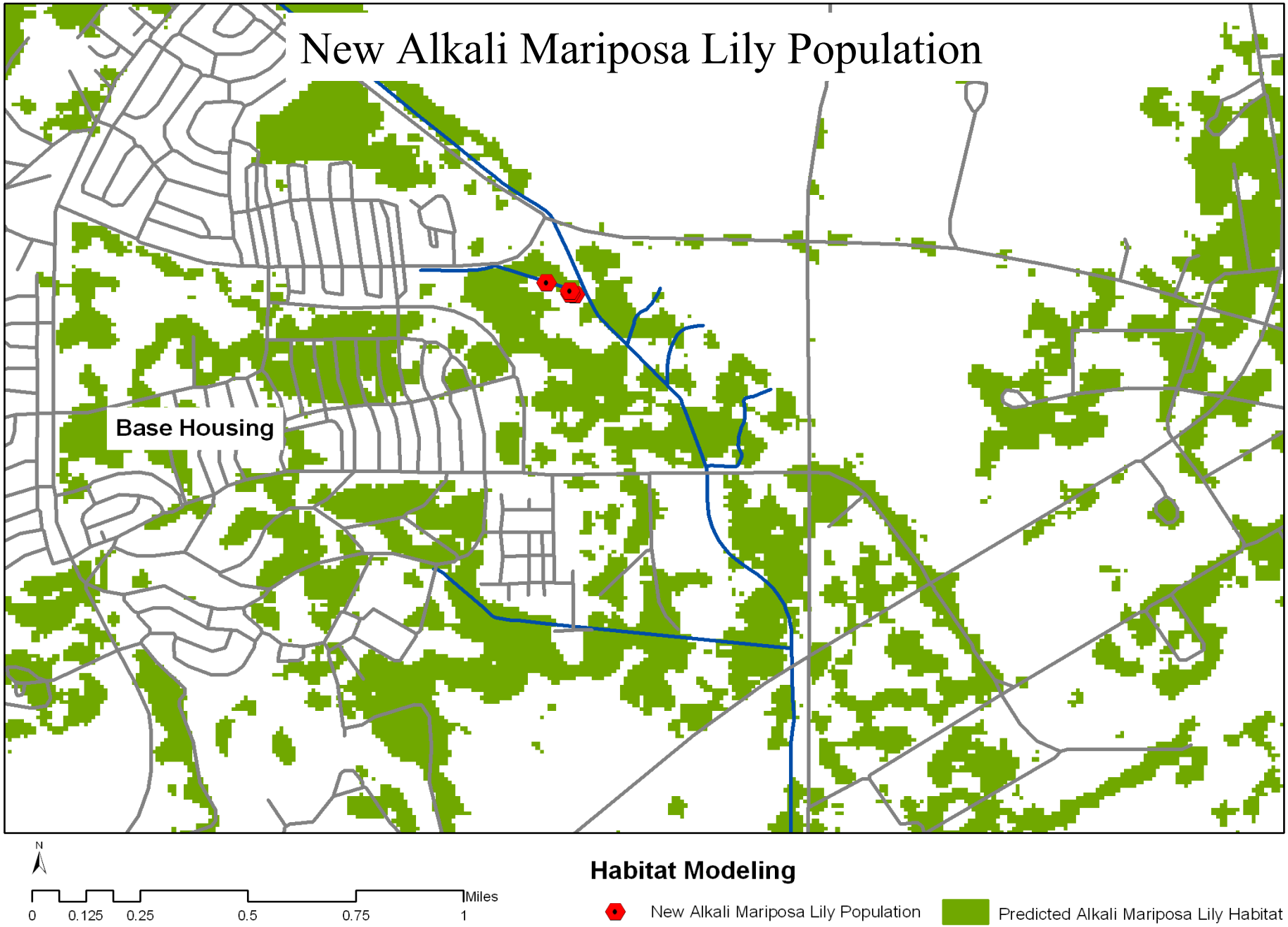
Reclassified LANDSAT Image



Alkali Mariposa Lily Known Populations

Predicted Habitat


New Alkali Mariposa Lily Population
Base Housing
N
0
0.125
0.25
0.5
0.75
1
Miles
Habitat Modeling
New Alkali Mariposa Lily Population
Predicted Alkali Mariposa Lily Habitat

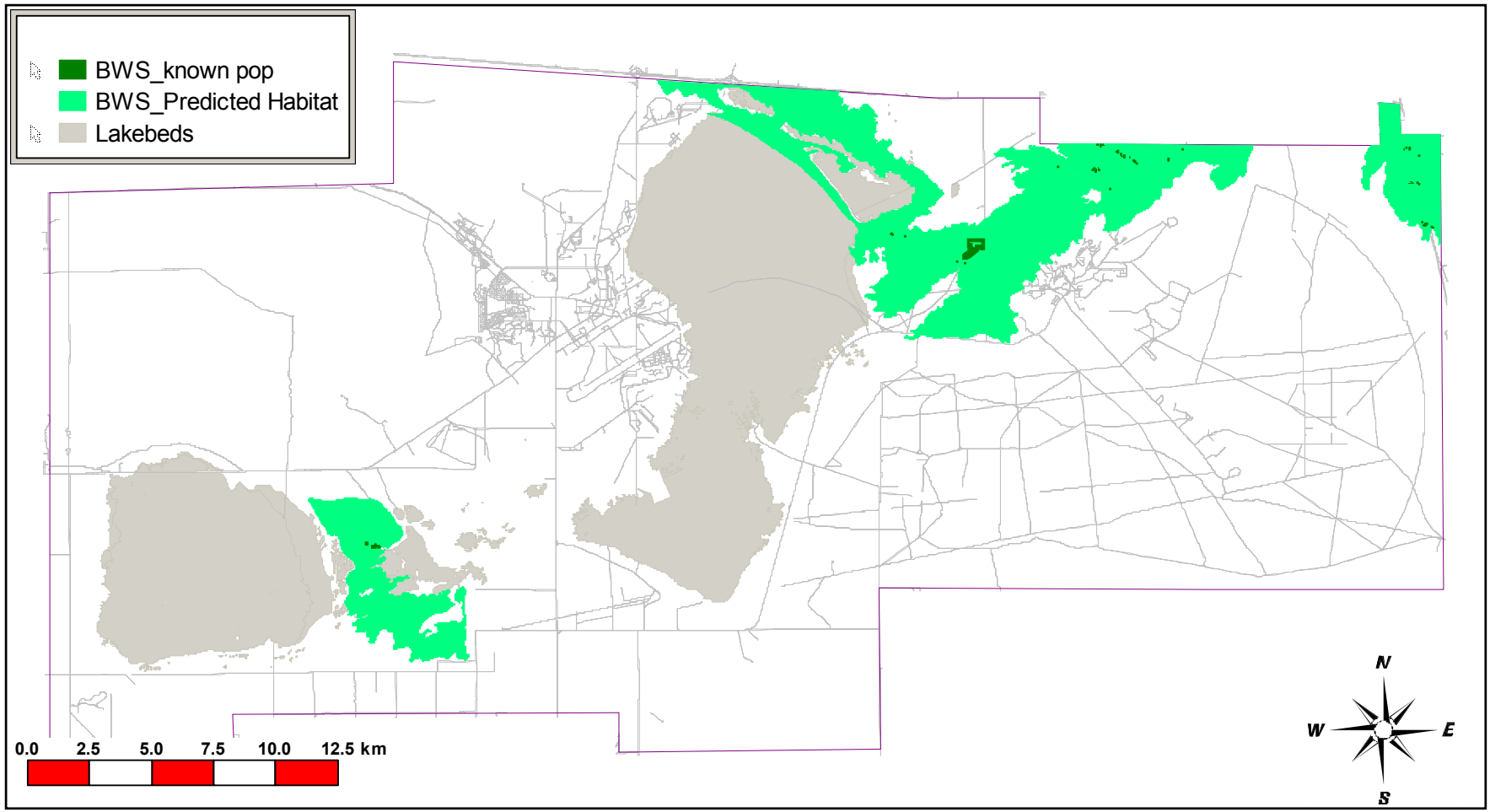
Barstow Woolly Sunflower
(Eriophyllum mohavense)
Predictive Habitat Modeling

AFFTC Environmental Management Directorate

Predicted Habitat Using Existing GIS Data

- Utilized Barstow Woolly Sunflower known locations
  - Determined habitat parameters
  - Conducted a GIS Spatial analysis
  - Delineated potential habitat
    - Limiting factor is soil type
    - Areas with little top soil, near rock outcrops

Predicted Habitat for Barstow Woolly Sunflower



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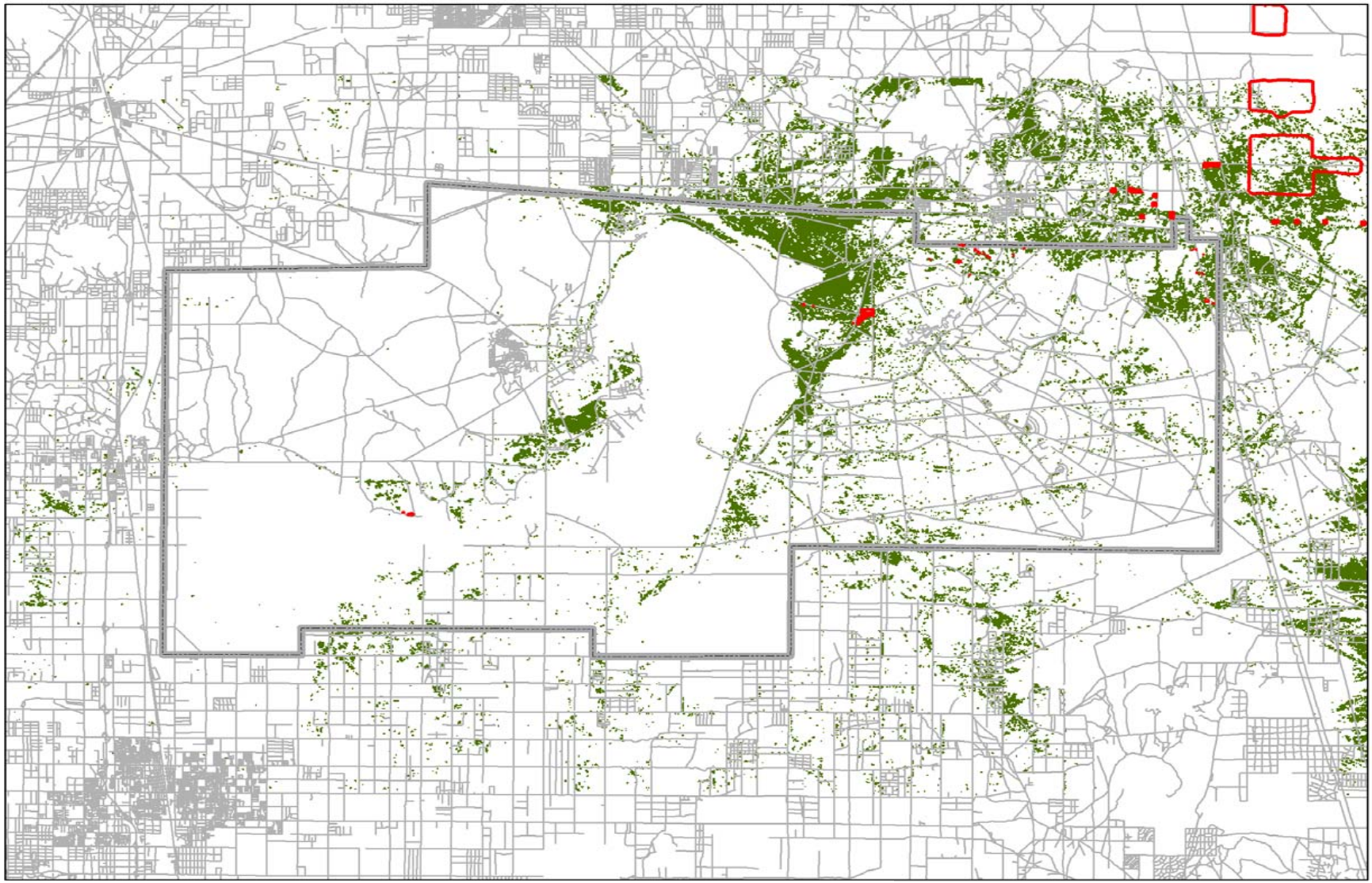
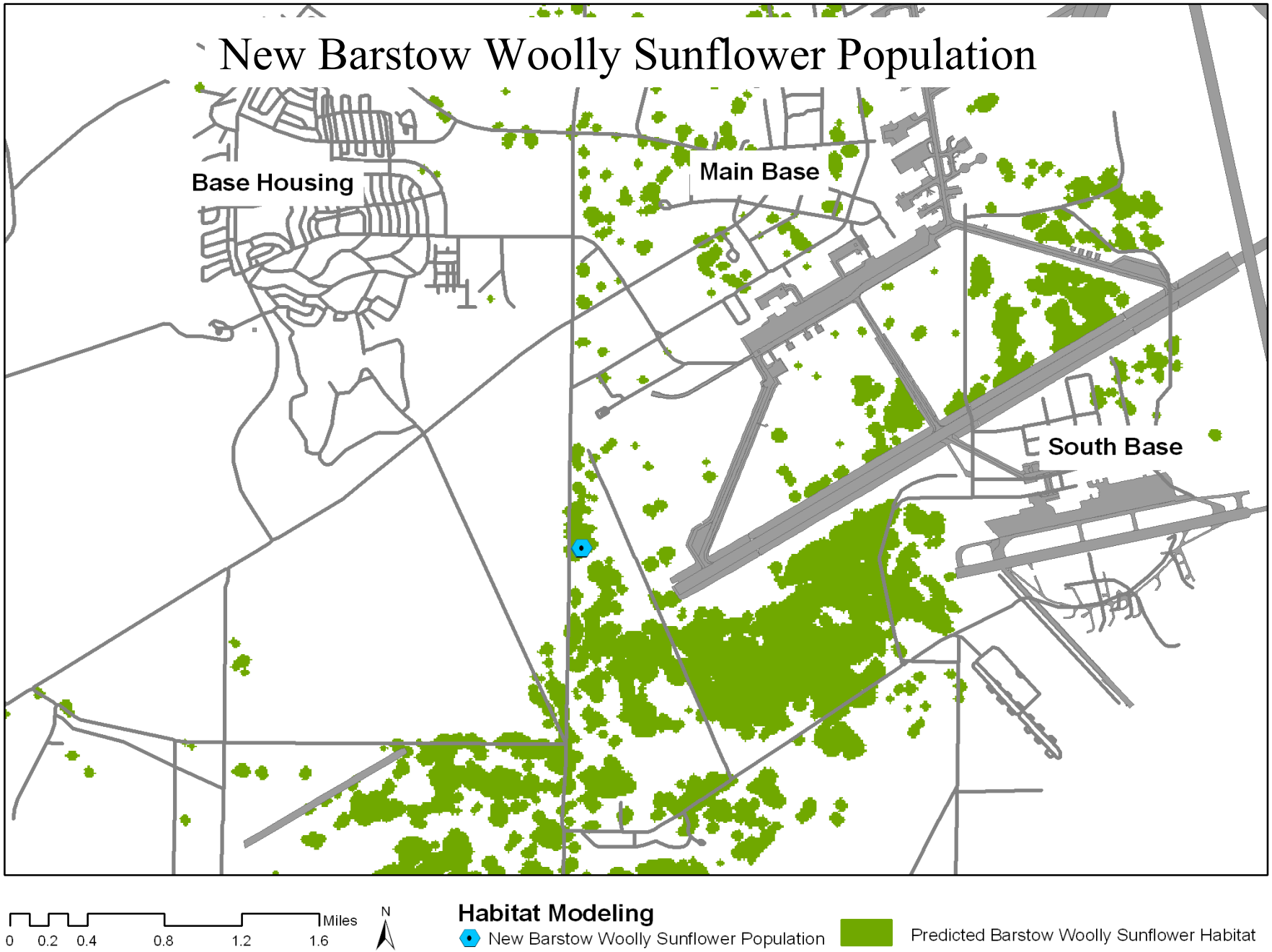
Reclassified LANDSAT Image



Predicted Barstow Woolly Sunflower Predicted Habitat

Known Populations


New Barstow Woolly Sunflower Population
Base Housing
Main Base
South Base
0 0.2 0.4 0.8 1.2 1.6
Miles
N
Habitat Modeling
New Barstow Woolly Sunflower Population
Predicted Barstow Woolly Sunflower Habitat

Model Validation

- Continue Model Validation Procedures
  - Positive results from ground-truthing efforts
  - Statistical analysis of collected data
  - Refine habitat parameters and predictive values
  - Continue ground-truthing efforts in 2004 and beyond

Future Focus

- Potential Future Applications
  - Model development for other sensitive species
    - Lancaster milkvetch
    - Pygmy poppy
    - Sage-like loeflingia
    - Mojave monkeyflower
  - Regional applications