



*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

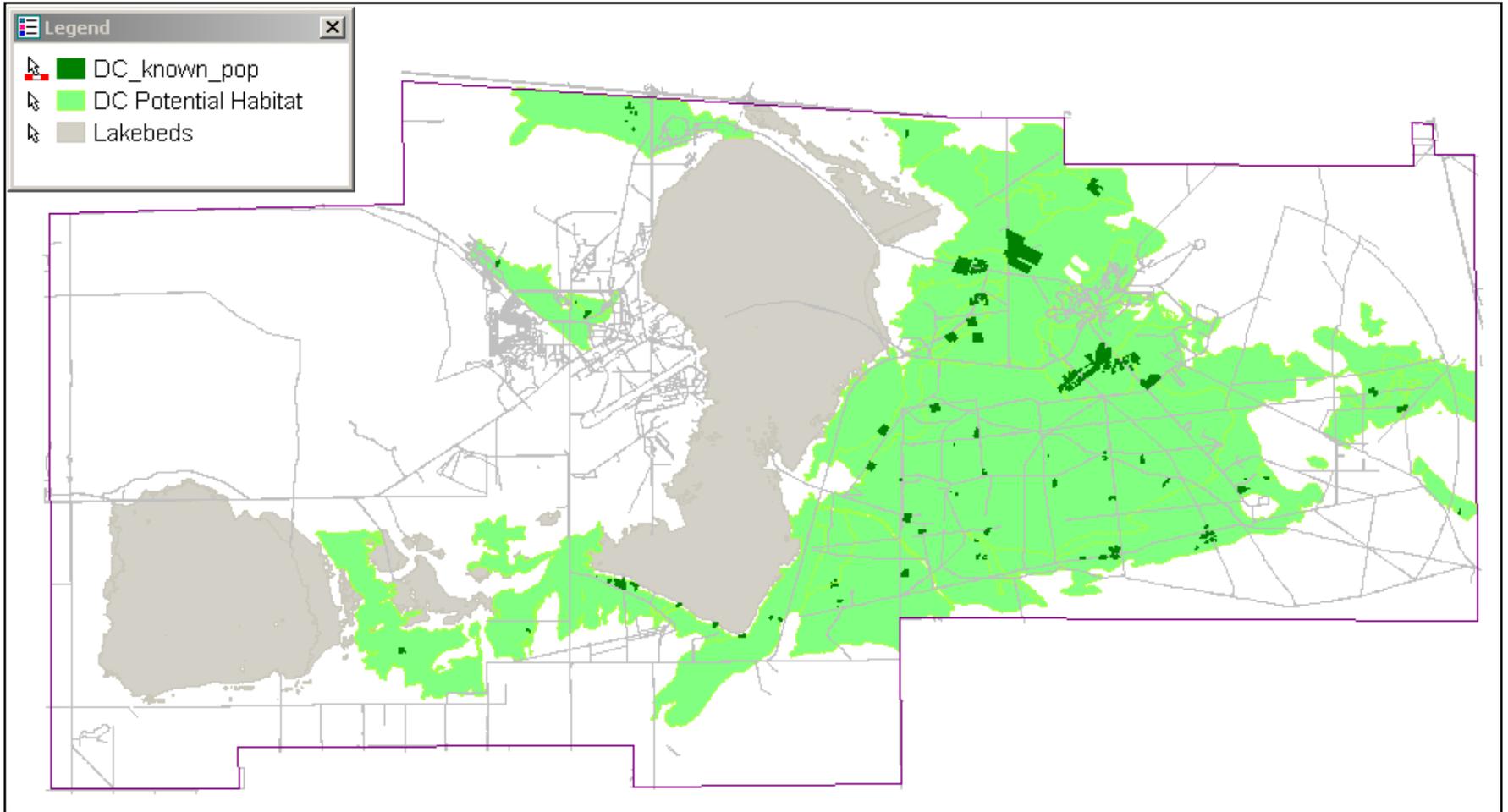


Predicted Habitat Using Existing GIS Data

- 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



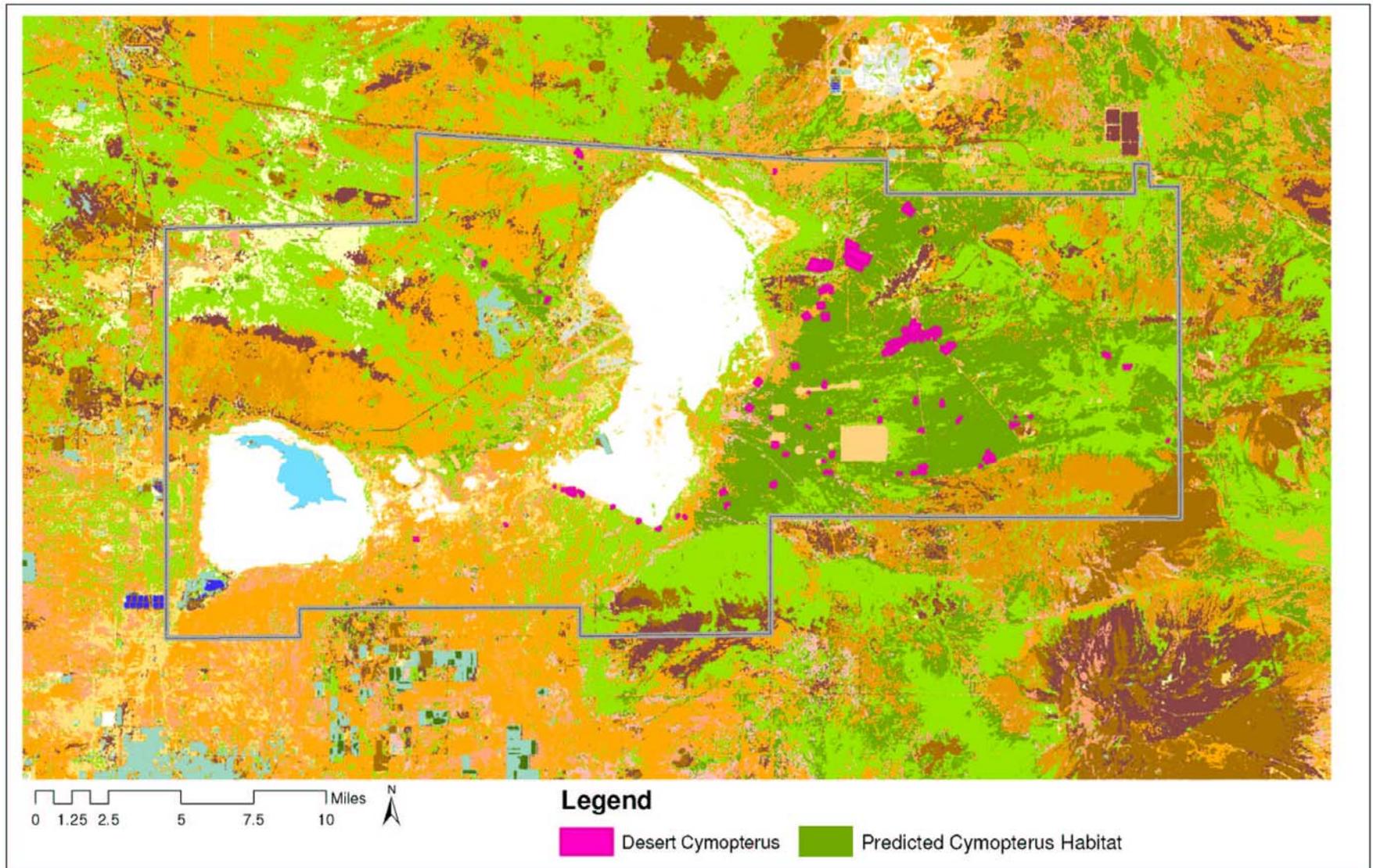
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Desert Cymopterus Predicted Habitat using LANDSAT Imagery

- 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

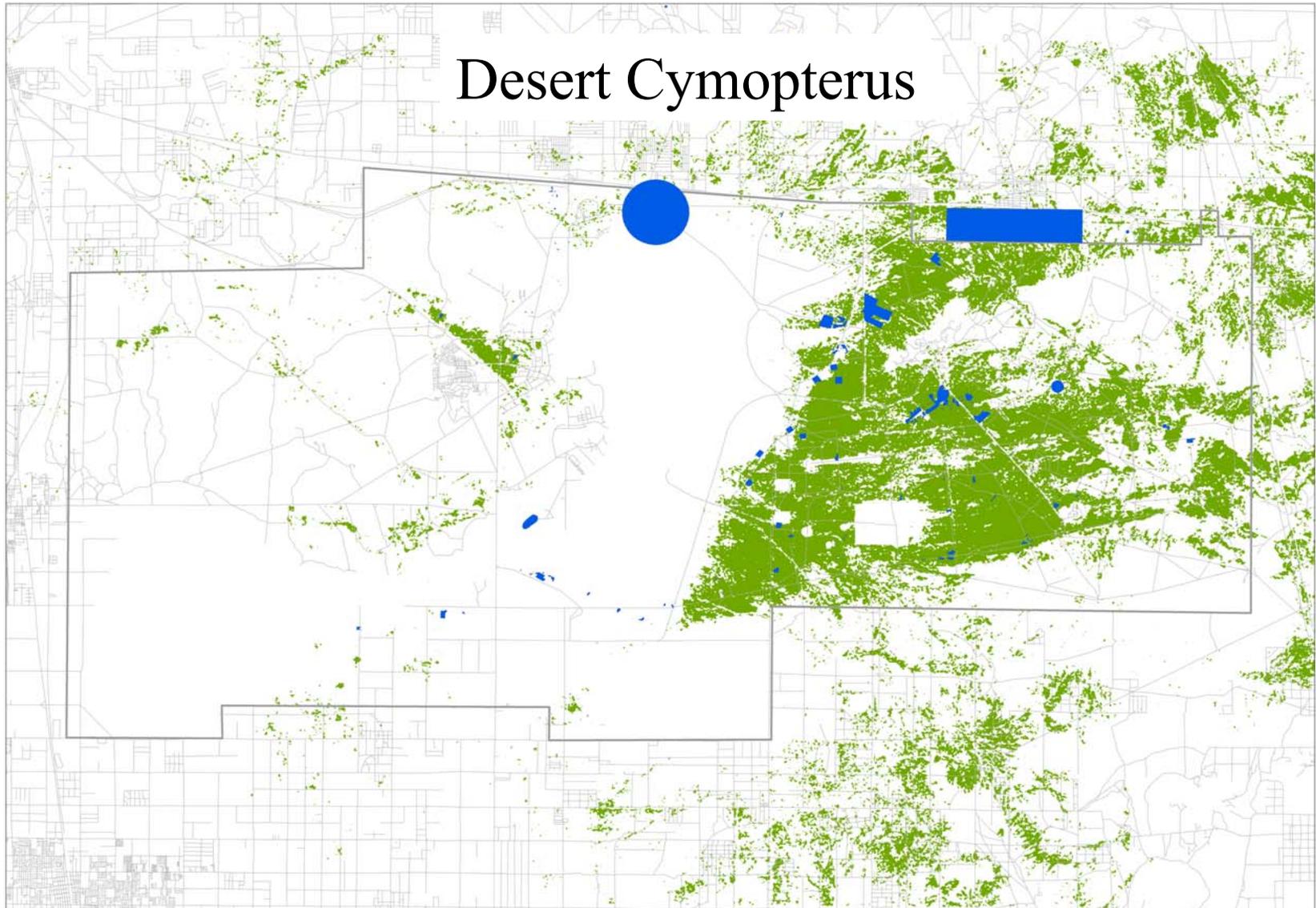


Supervised Classification of LANDSAT Image



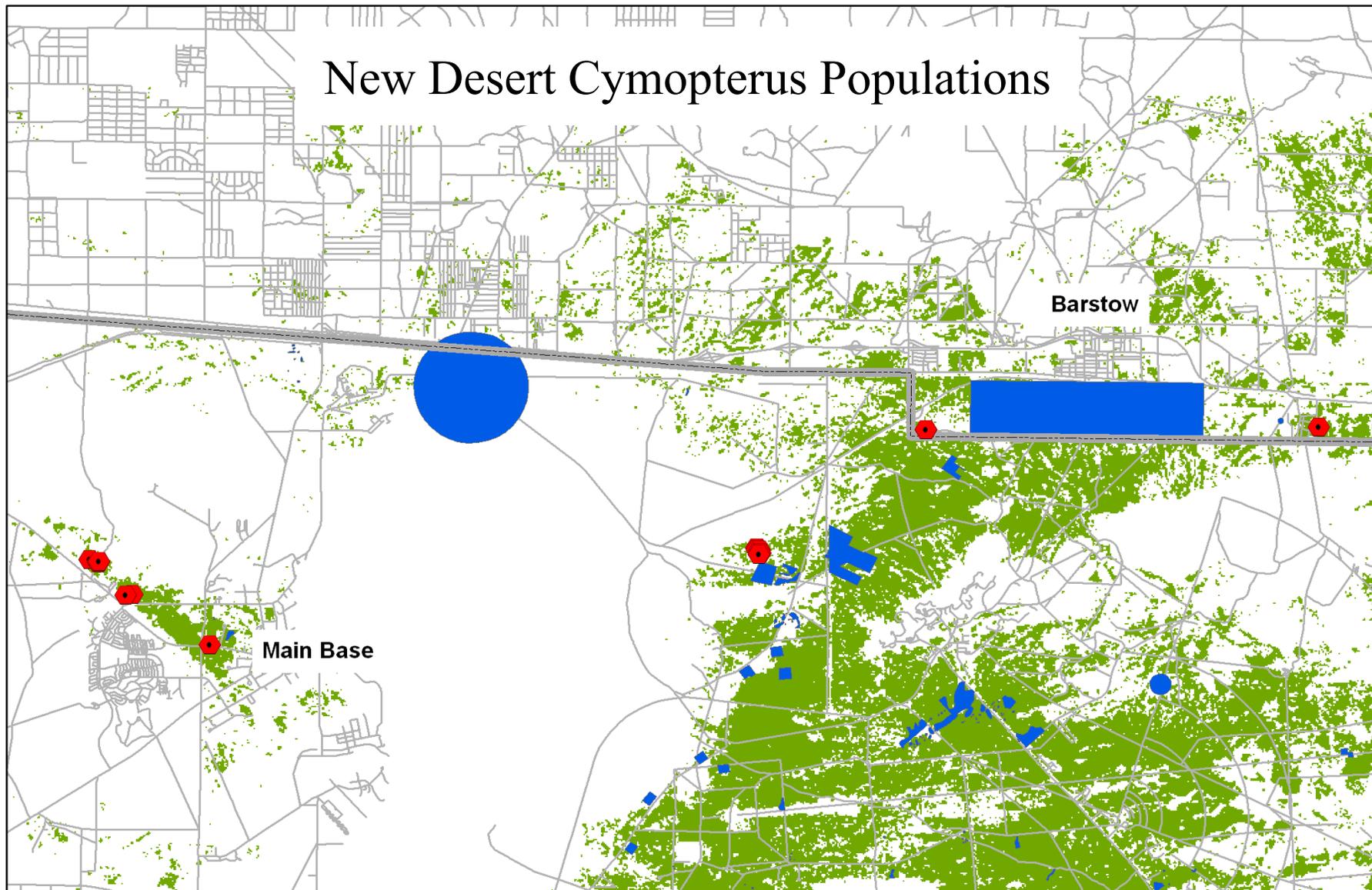
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Reclassified LANDSAT Image



 Desert Cymopterus Known Populations  Predicted Habitat

New Desert Cymopterus Populations



Habitat Modeling

 Known Cymopterus Populations



New Desert Cymopterus Population



Predicted Cymopterus Habitat



0 1 2 4 6 8 Miles

Alkali Mariposa Lily
(*Calochortus striatus*)
Predictive Habitat Modeling

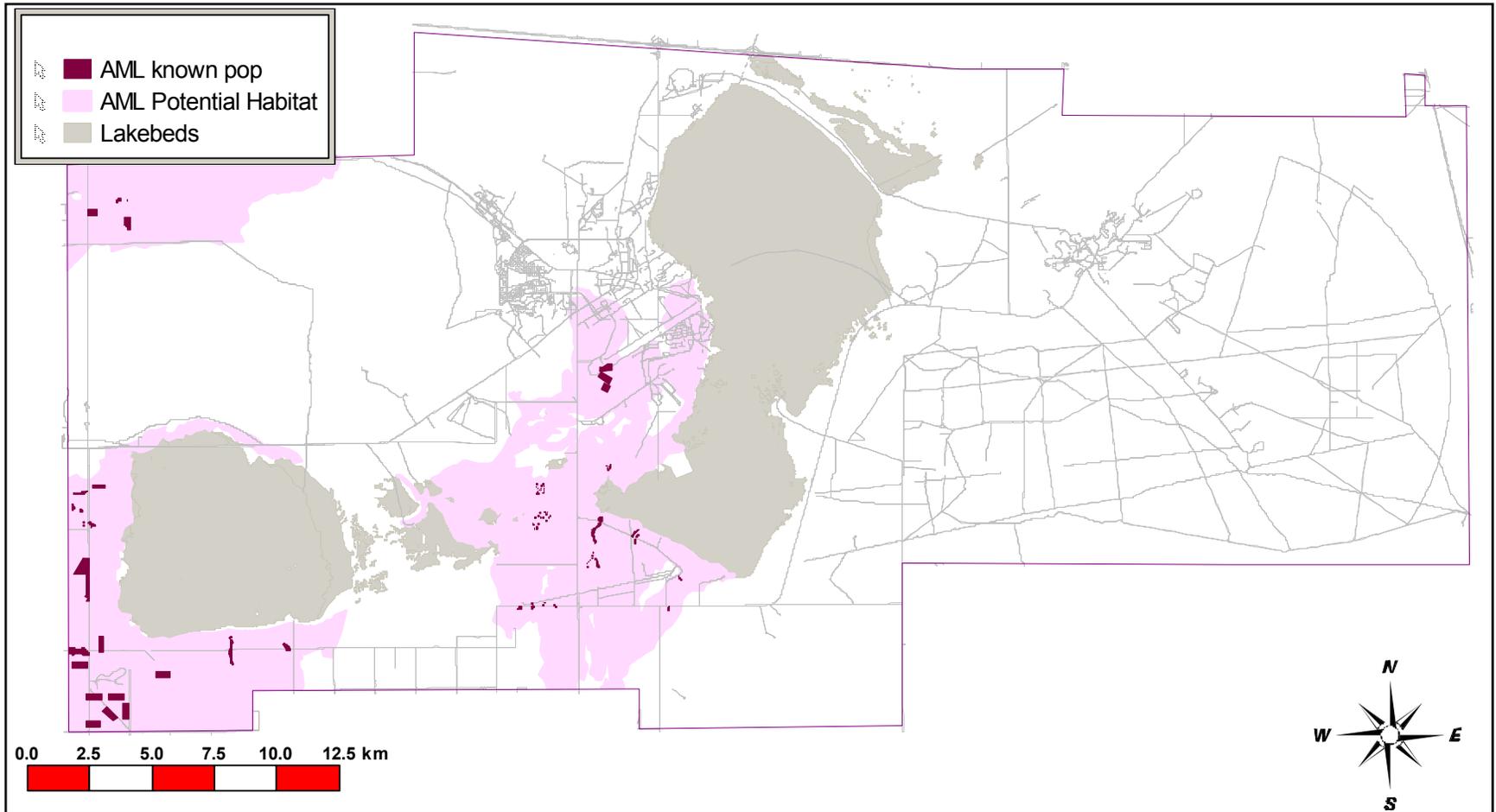


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Predicted Habitat Using Existing GIS Data

- 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

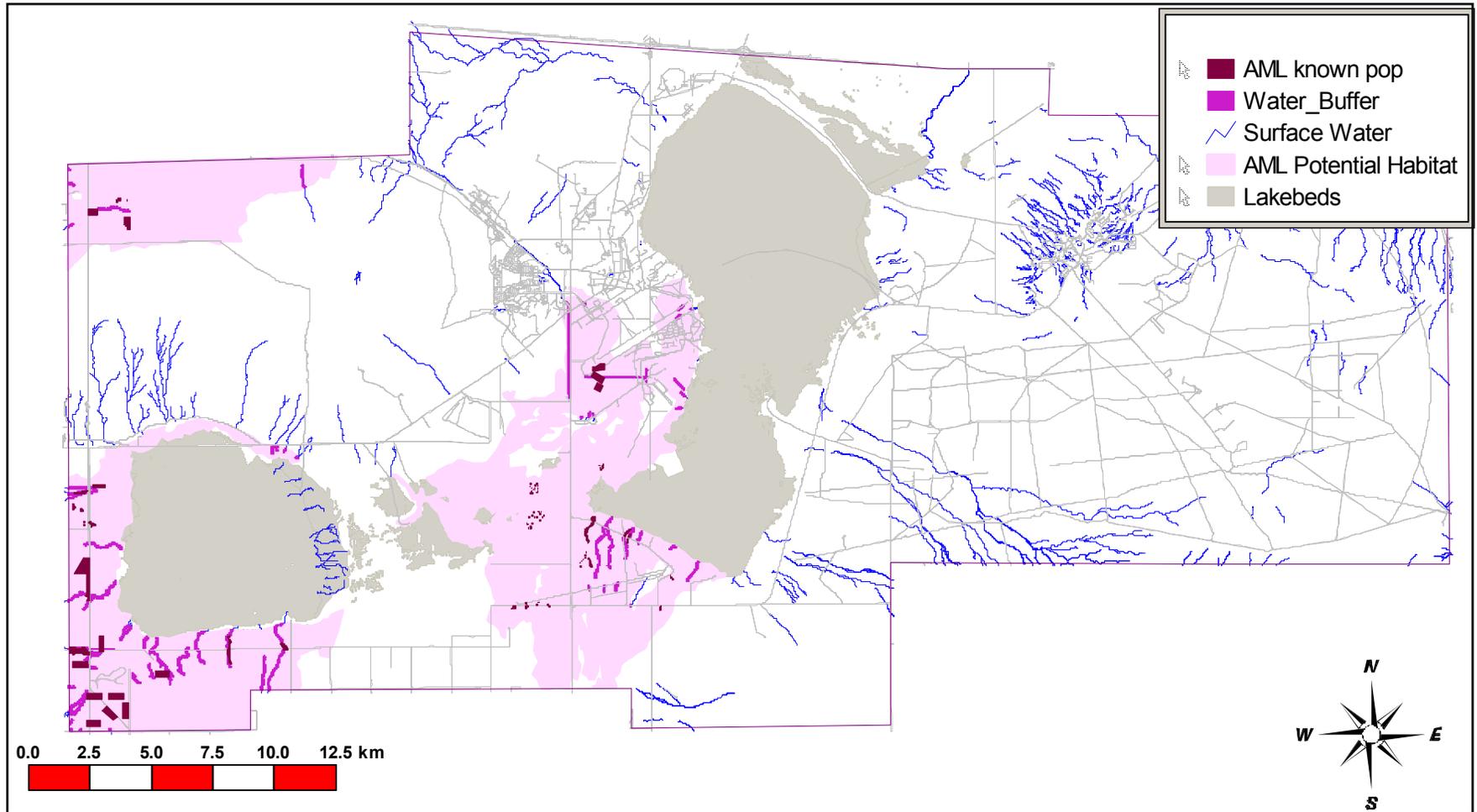
Alkali Mariposa Lily Predicted Habitat



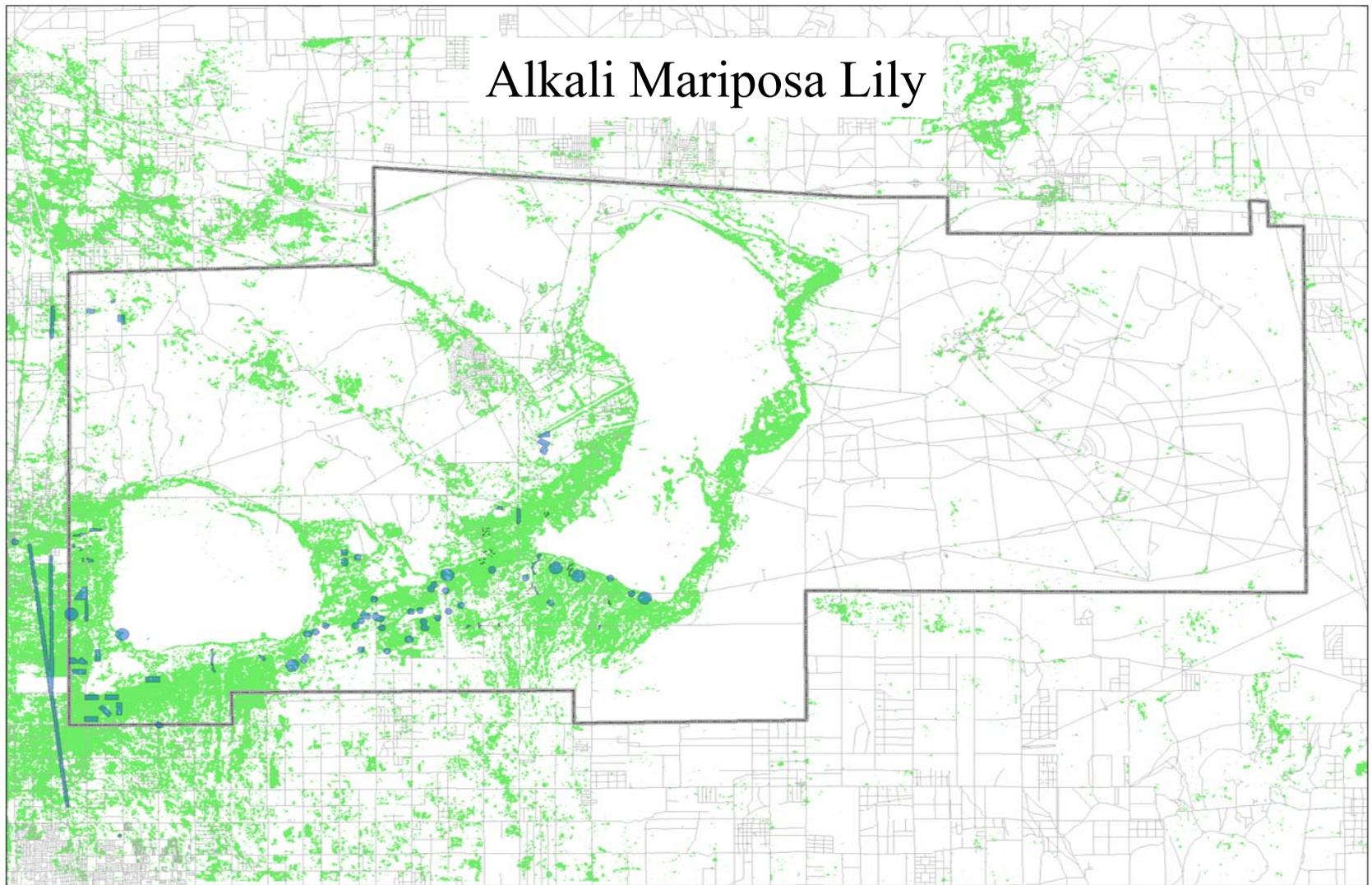
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Alkali Mariposa Lily Predicted Habitat

Showing Seasonally Inundated Channels



Reclassified LANDSAT Image

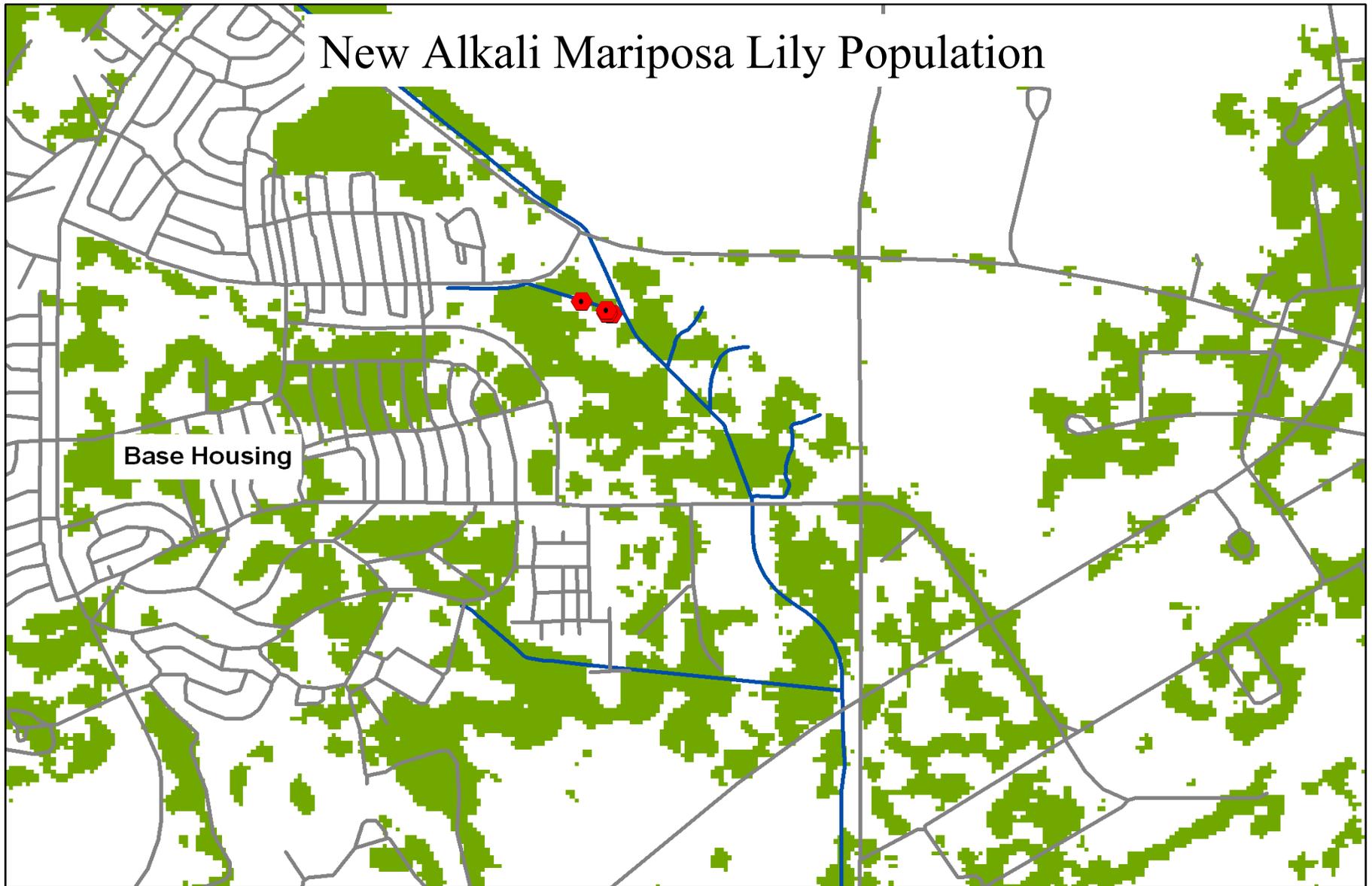


Alkali Mariposa Lily Known
Populations

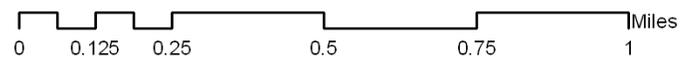


Predicted Habitat

New Alkali Mariposa Lily Population



Base Housing



Habitat Modeling

-  New Alkali Mariposa Lily Population
-  Predicted Alkali Mariposa Lily Habitat

Barstow Woolly Sunflower
(Eriophyllum mohavense)
Predictive Habitat Modeling

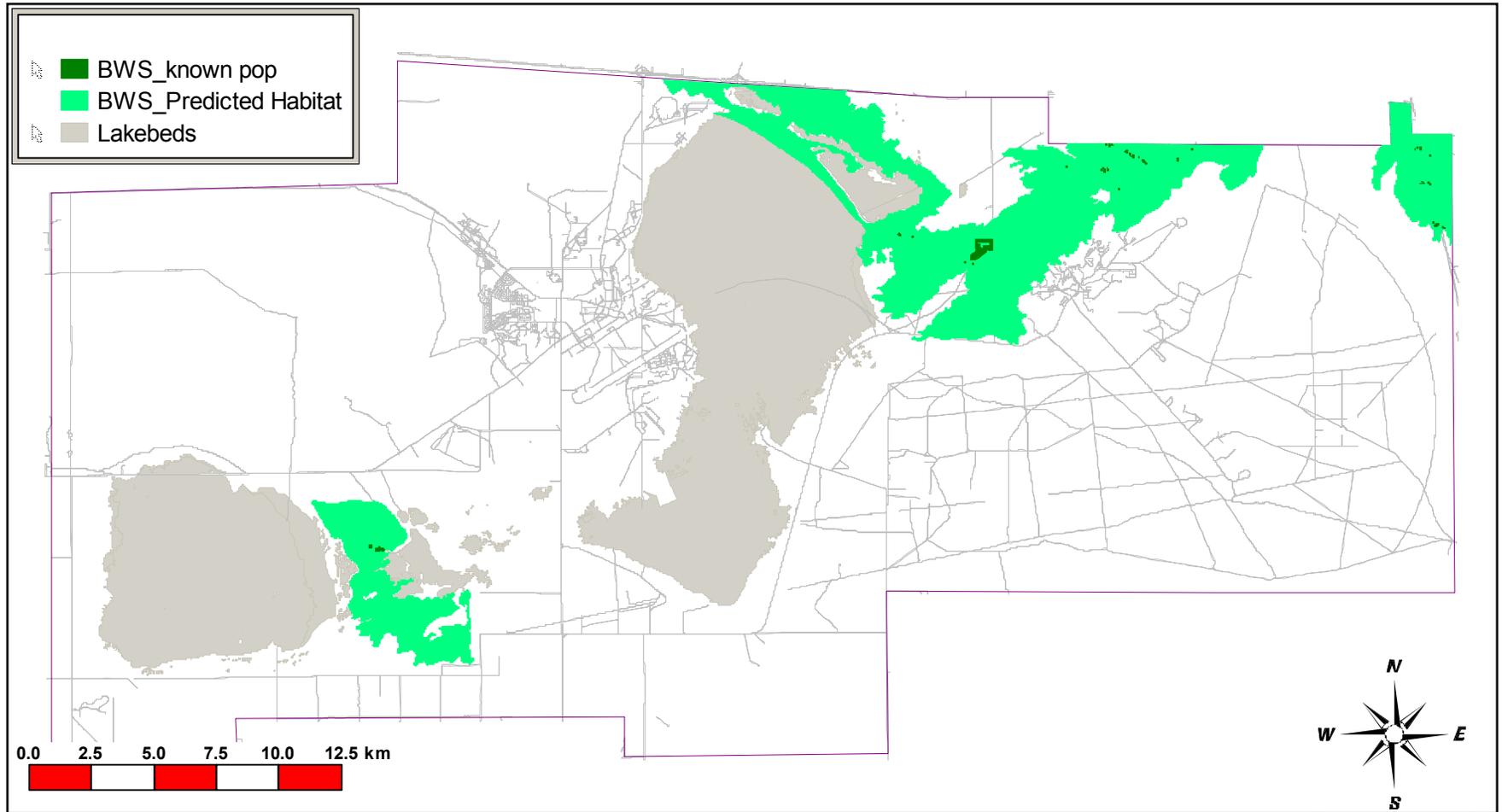


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Predicted Habitat Using Existing GIS Data

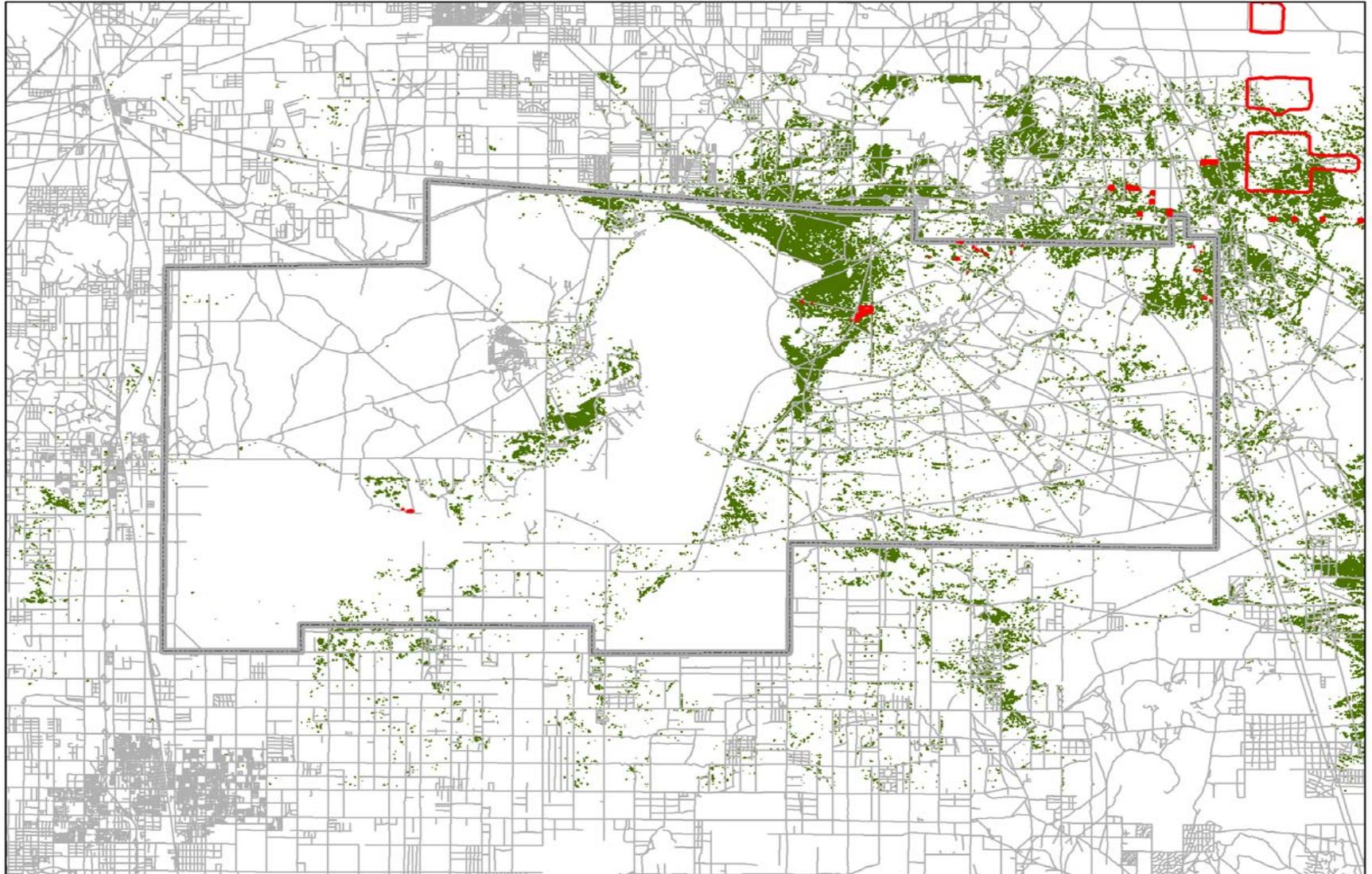
- Utilized Barstow Woolly Sunflower known locations
 - Determined habitat parameters
 - Conducted a GIS Spatial analysis
 - Delineated potential habitat
 - Limiting factor is soil type
 - Areas with little top soil, near rock outcrops

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



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