

Tonaquint Property – Vegetation Community Management Considerations

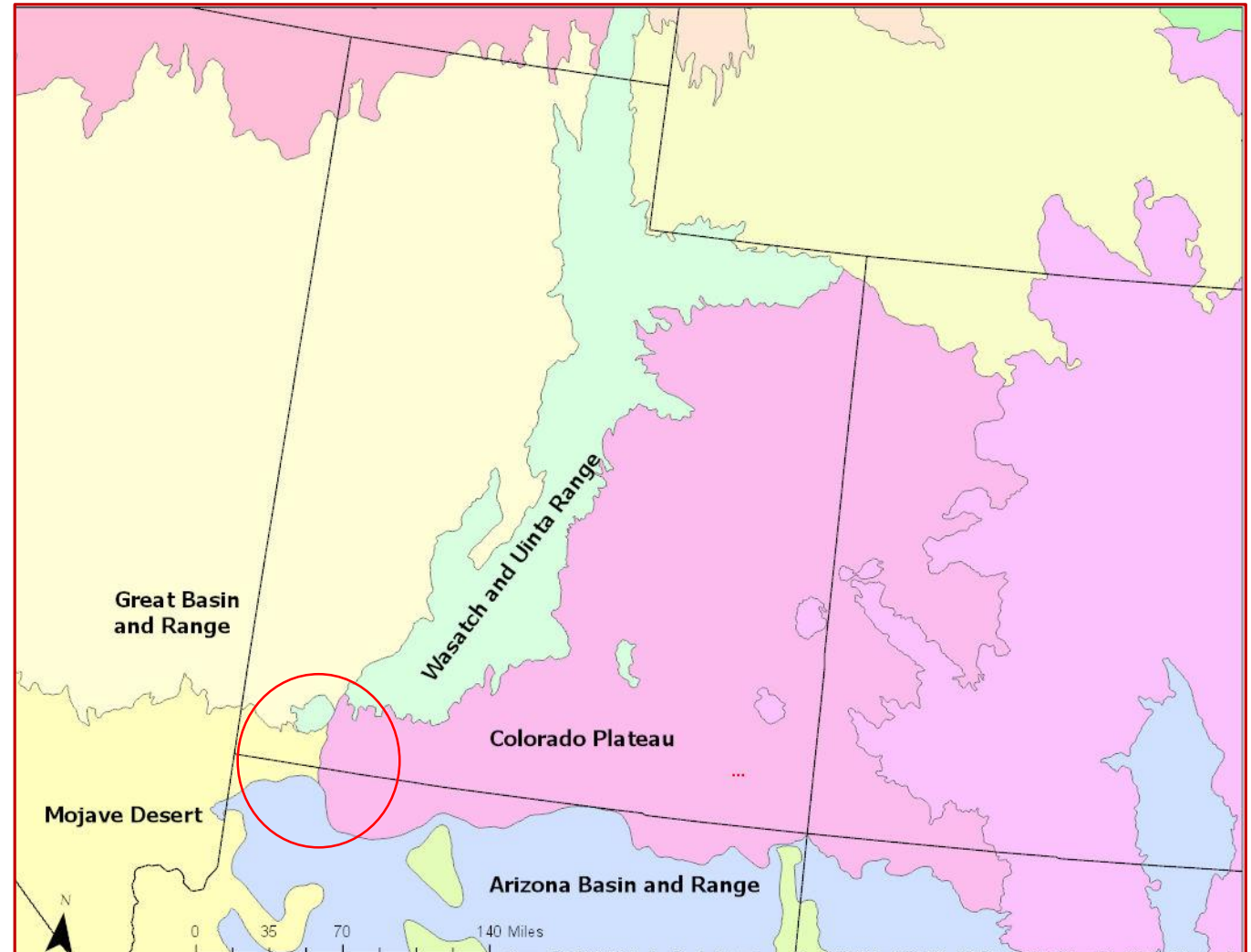


Outline

- I. Unique Ecological Setting of Project Area
- II. Designated Vegetation Communities
 - A. Why Vegetation Communities
 - B. Location/Extent
 - C. Condition
- III. Listed and Sensitive Species Presence
- IV. Invasive Species
- V. Recreation
- VI. Putting it All Together for Management

What Makes Tonaquint Special for so Many?

- Transition zone (“Ecotone”) between Colorado plateau, Mojave Desert and Great Basin (region has characteristics of all three, thus high diversity)
- T&E species
- Geology (different growth substrates)
- Diversity in recreation possibilities



Diversity Specifics

State listed Sensitive Species

Plants

Parry's Sandpaper Plant (*Petalonyx parryi*)

Animals

Gila Monster

... 36 total sensitive animal species for Washington County

Vascular Plants

- 799 Plants within 25km (Seinet)
- 1398 plants in Washington County (Utah Flora)
- 8 Vegetation Communities

Federally listed Species in Washington County

Plants

Dwarf Bearclaw-poppy (*Arctomecon humilis*) Endangered
Gierisch's globemallow (*Sphaeralcea gierischii*) Endangered
Paradox Milkvetch (*Astragalus holmgreniorum*) Endangered
Shivwits Milkvetch (*Astragalus ampullarioides*) Endangered
Siler Pincushion Cactus (*Pediocactus sileri*) Threatened

Animals

Mojave Desert Tortoise - Threatened
Southwestern Willow Flycatcher
Mexican Spotted Owl
Utah Prairie Dog
Virgin Chub
Woundfin
Western Yellow-billed

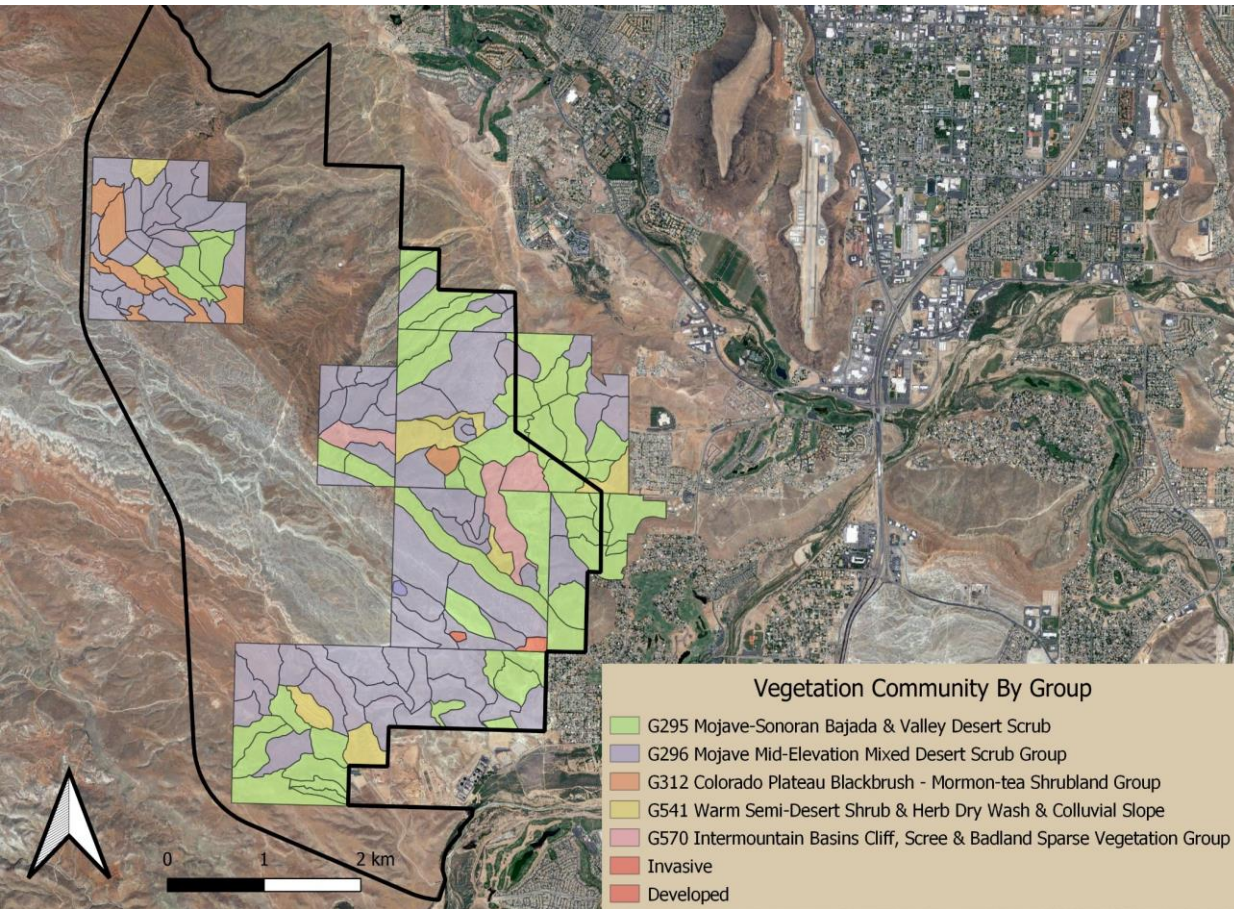
Red = Found in Tonaquint Property

Blue = Found within 5 miles of Tonaquint

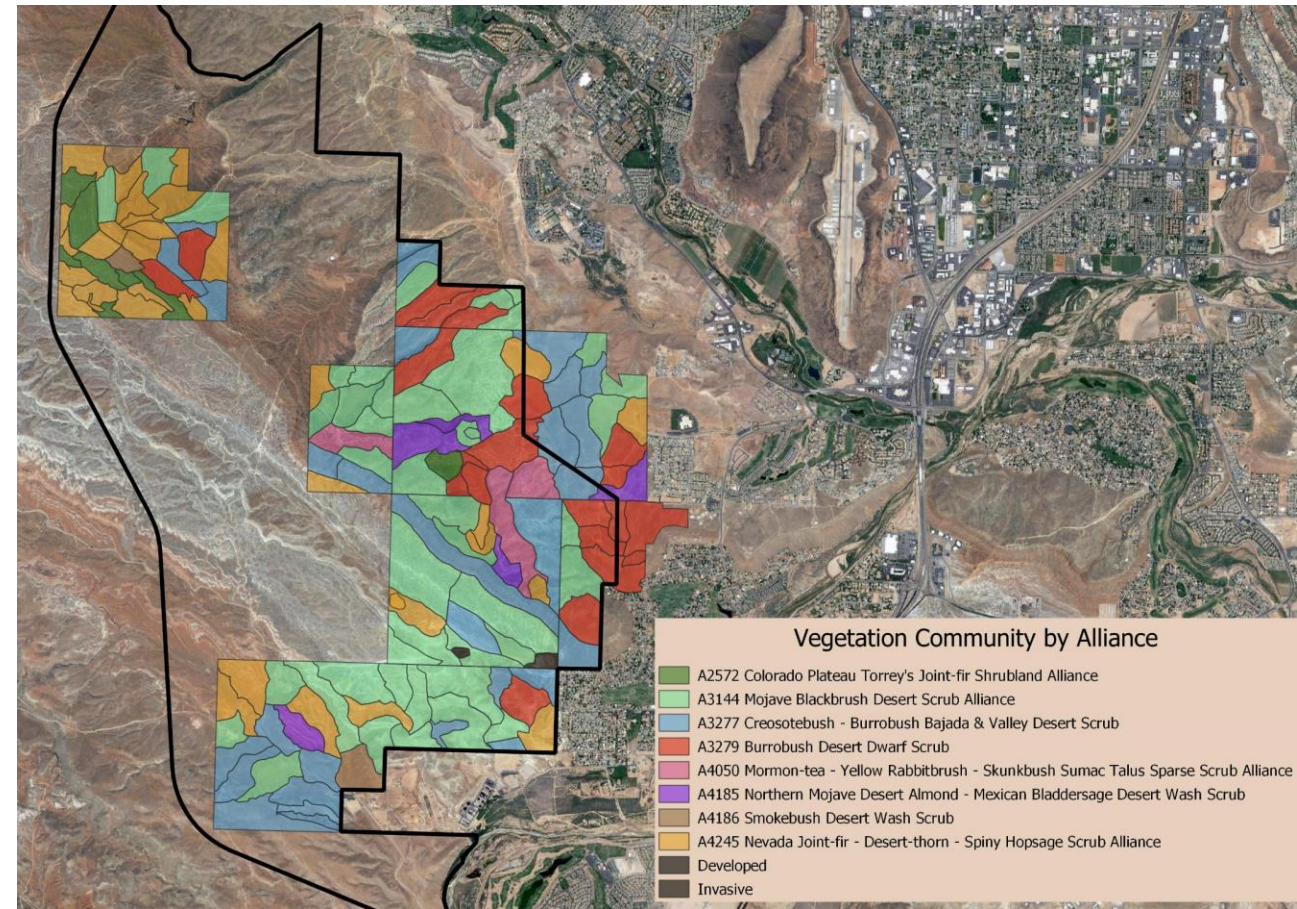
Why Vegetation Communities?

- Vegetation communities - groups of plants sharing a common environment that interact with each other, animal populations, and the physical environment. Vegetation communities are often defined by dominant plant species that provides useful habitat information for many animal species.
- **Provides a way to organize biological information, creating mappable units for land management and conservation planning.**
 - We used US National Vegetation Classification (USNVC) – The USNVC is hierarchical where upper levels emphasize growth forms and macro-ecology drivers, while lower levels use localized conditions and floristic composition – so even if you know just the upper levels, you still have an idea of the community

Vegetation community Hierarchy (Group vs Alliance)



Eco-region scale



Plant association scale

Mojave Blackbrush Desert Scrub

The most common in the project area, this alliance is highly variable with blackbrush being the dominant shrub with a wide variety of possible associates including Eastern Mojave Buckwheat, burrobush and creosote bush. This community has a slow recovery time and is costly to restore after intense fires.



Creosote and Burrobush Desert Scrub

This is likely the most common vegetation community occurring within the Mojave desert, and the second most commonly occurring community within the study area. It is defined as being creosote dominant, with associated cover similar to the Mojave Blackbrush desert scrub, with blackbrush lacking



Information Embedded in Vegetation Community delineations

Mojave Blackbrush Desert Shrub

Vs

Burrobush Desert Dwarf Shrub

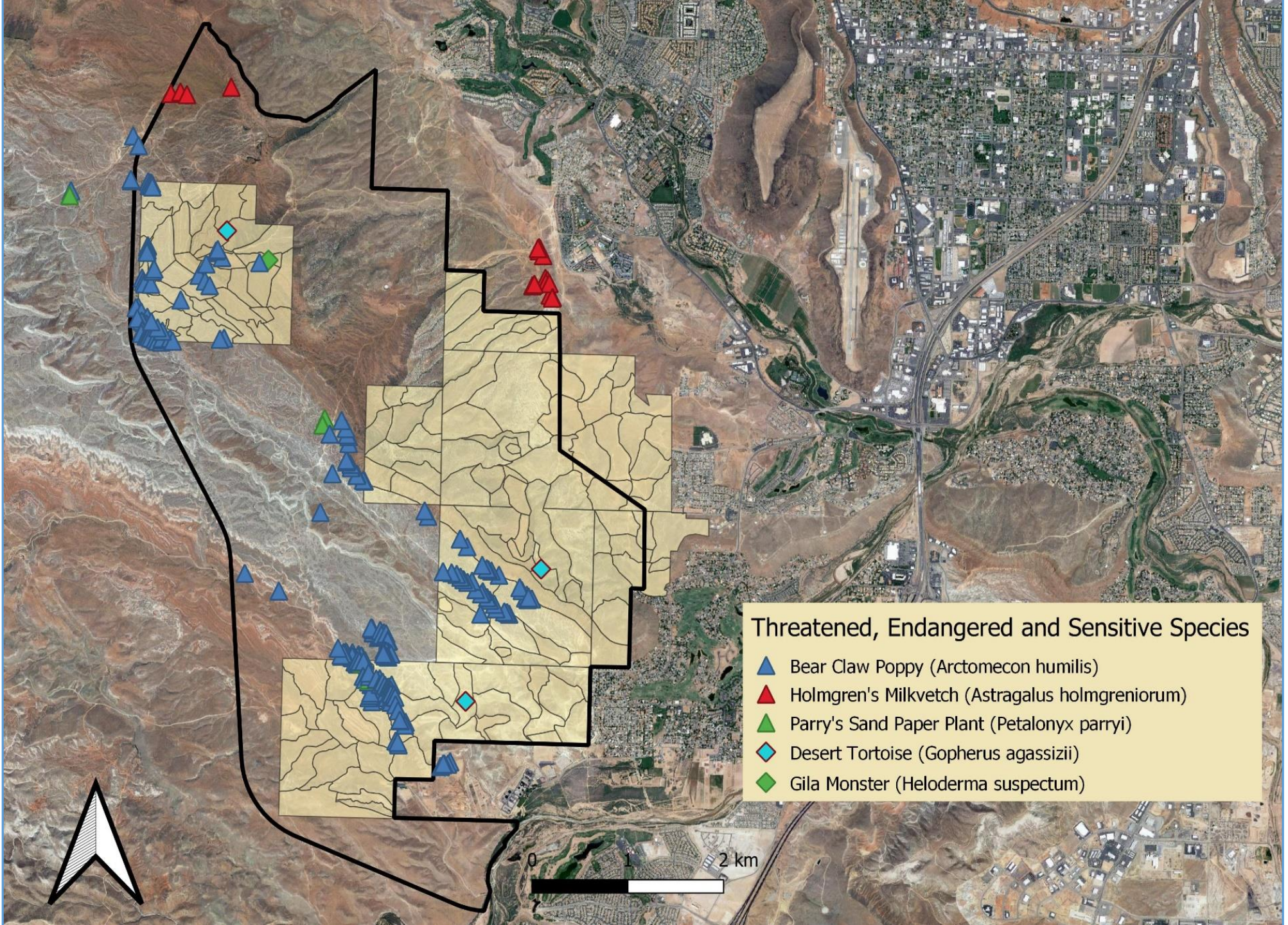
- Blackbrush has a broad ecological range (Co Plateau, Great Basin and Mojave)
- Can not reproduce vegetatively – has Infrequent and inconsistent seed set
- NOT adapted to fire – fire often kills whole plant and seeds in the soil– may take 60 years to re-establish without intervention
- Somewhat shallow rooted
- Provides cover (and sometimes food) for nongame birds, desert tortoise, and small mammals
- Tends toward stands of chiefly blackbrush, can introduce diversity through thoughtful disturbance
- Contributes to desert fertility by protecting the soil against wind erosion and Protecting understory vegetation thus retaining surface nitrogen and nitrogen in the soil

- Burrobush mainly restricted to Sonoran and Mojave Deserts
- Vegetative reproduction possible, can resprout after fire -if fire is not particularly severe
- Can colonize disturbed areas (provided a seed source nearby)
- More deeply rooted
- Provides protection to understory species and can serve as a ‘nurse’ plant for creosote bush and others, seeds provide food for rodents
- Often associated with creosote bush
- Adapted to shifting soils

Micro-Communities within Communities



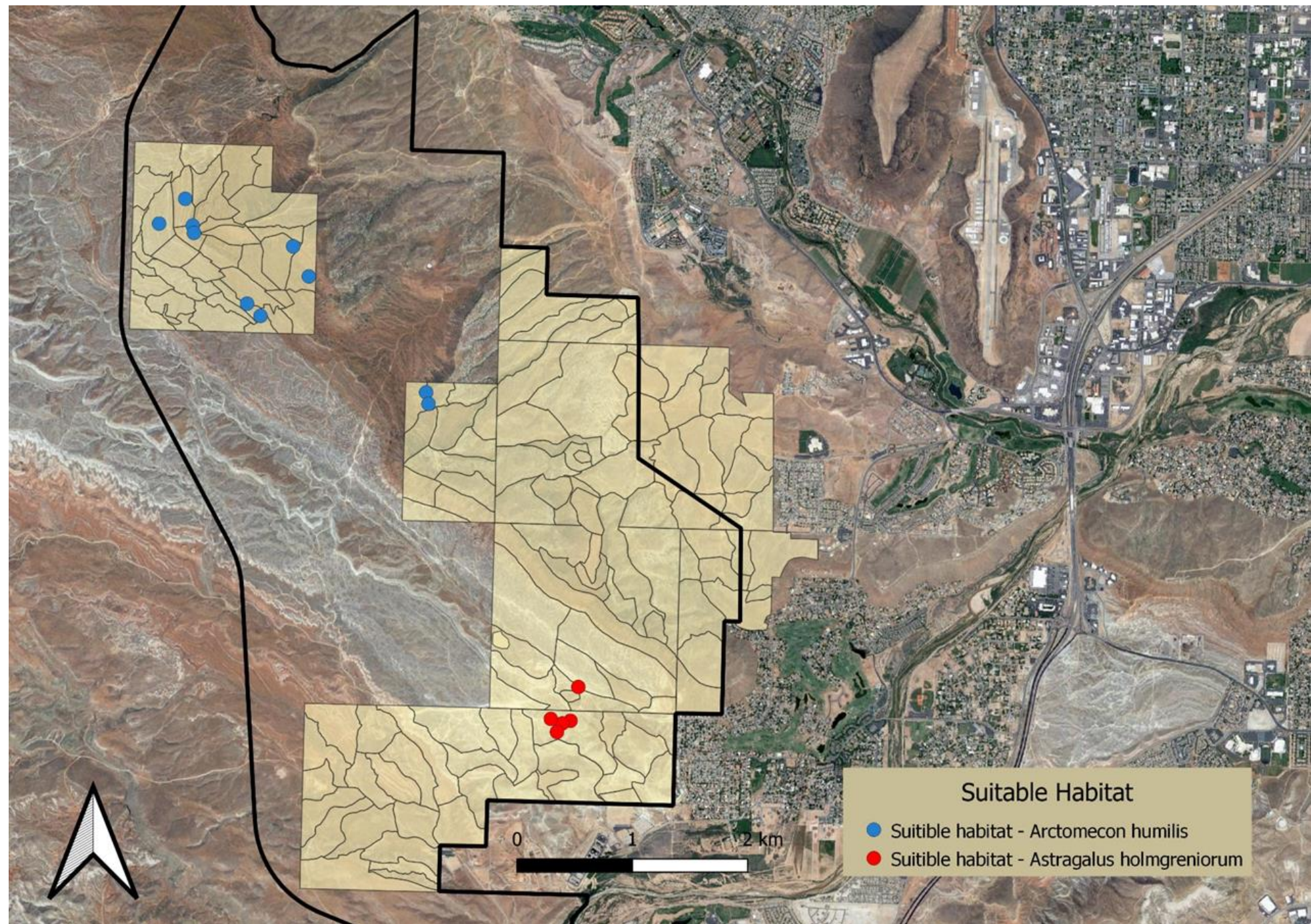
'Interesting Feature' shp file





Species of
Interest
within (and
just outside)
Tonaquint

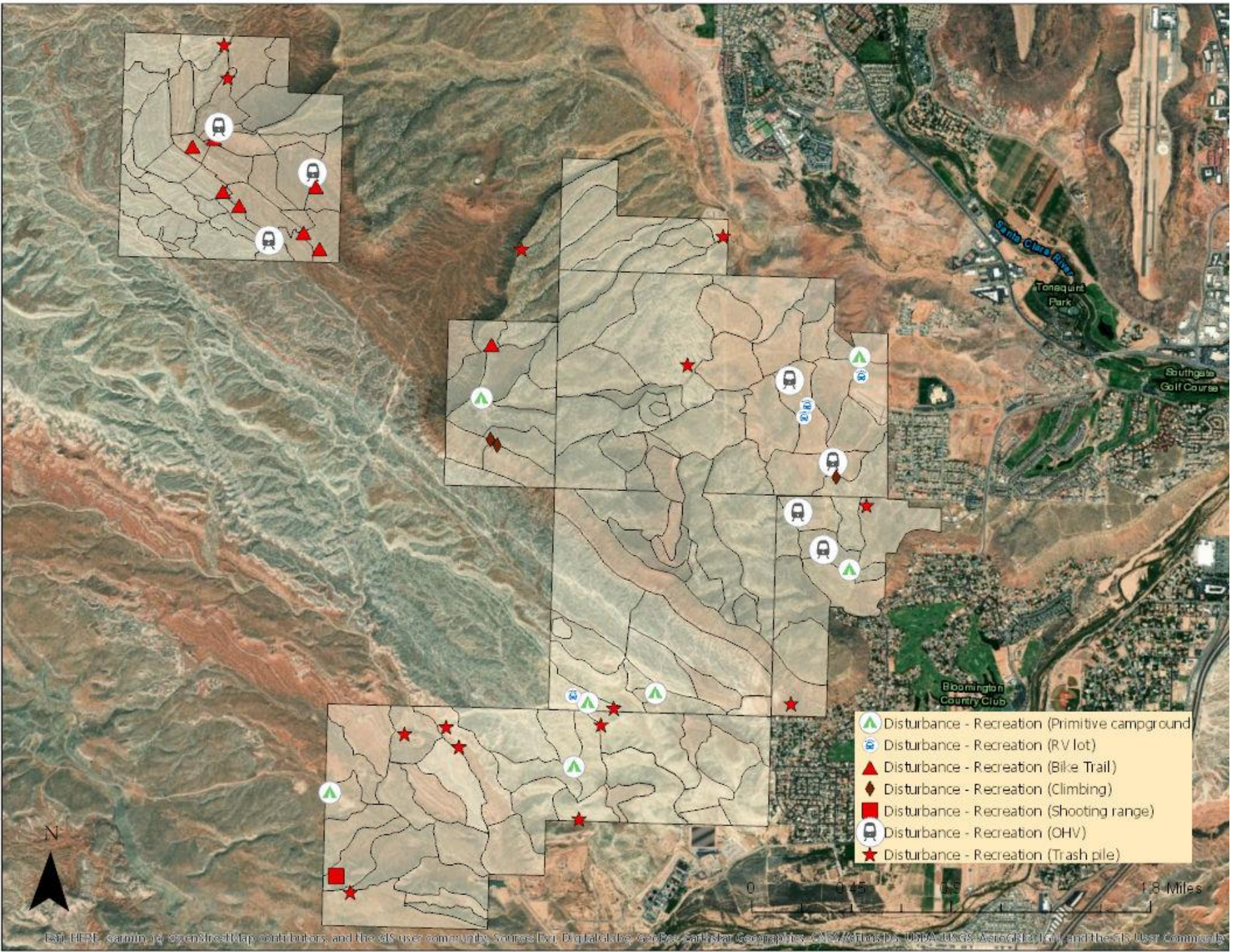
Potential
Reintroduction sites
for Bear Claw Poppy
(*Arctomecon humilis*)
and Holmgren
Milkvetch (*Astragalus
holmgreniorum*)



Recreation

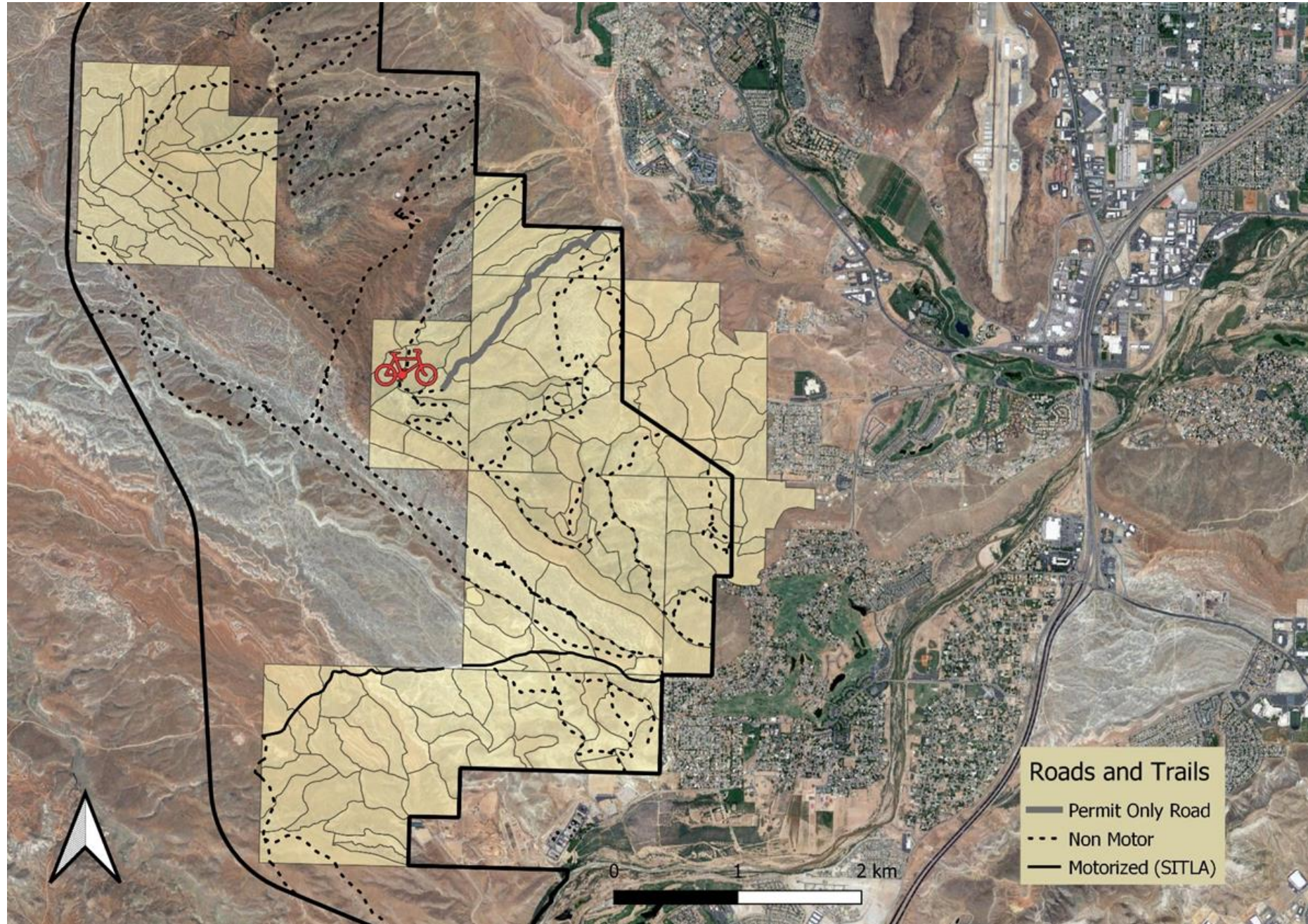
- Biking
- Climbing
- Hiking
- Dispersed Camping
- Shooting
- OHV/Motorcycles

'Interesting Feature' Shp

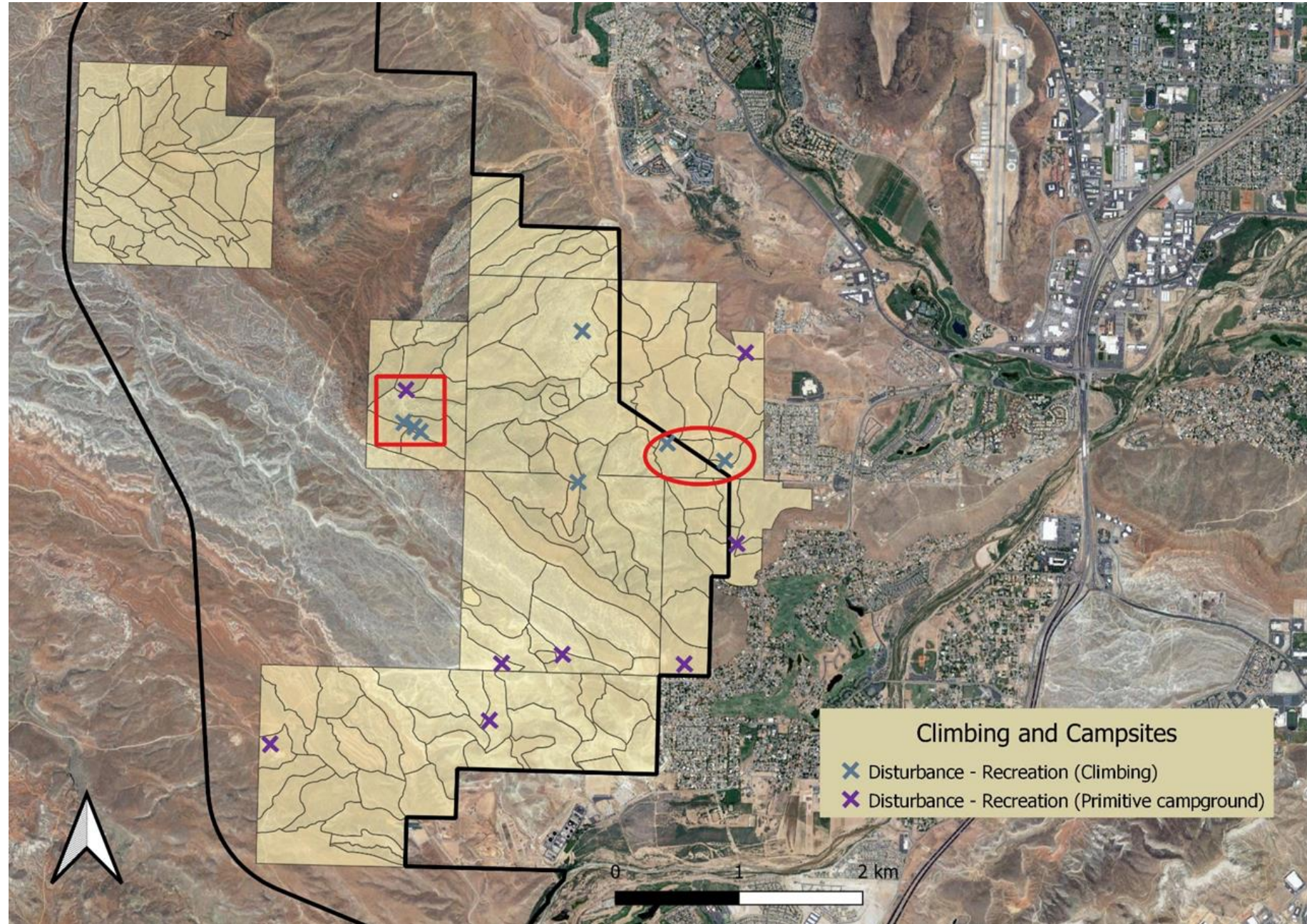


Biking

- Trails** (Bike, OHV, Hiking, etc) can greatly increase the chances of weed establishment by:
- Serving as a vector for weed seeds
 - Damaging soil cryptocrust
 - Increasing soil compaction



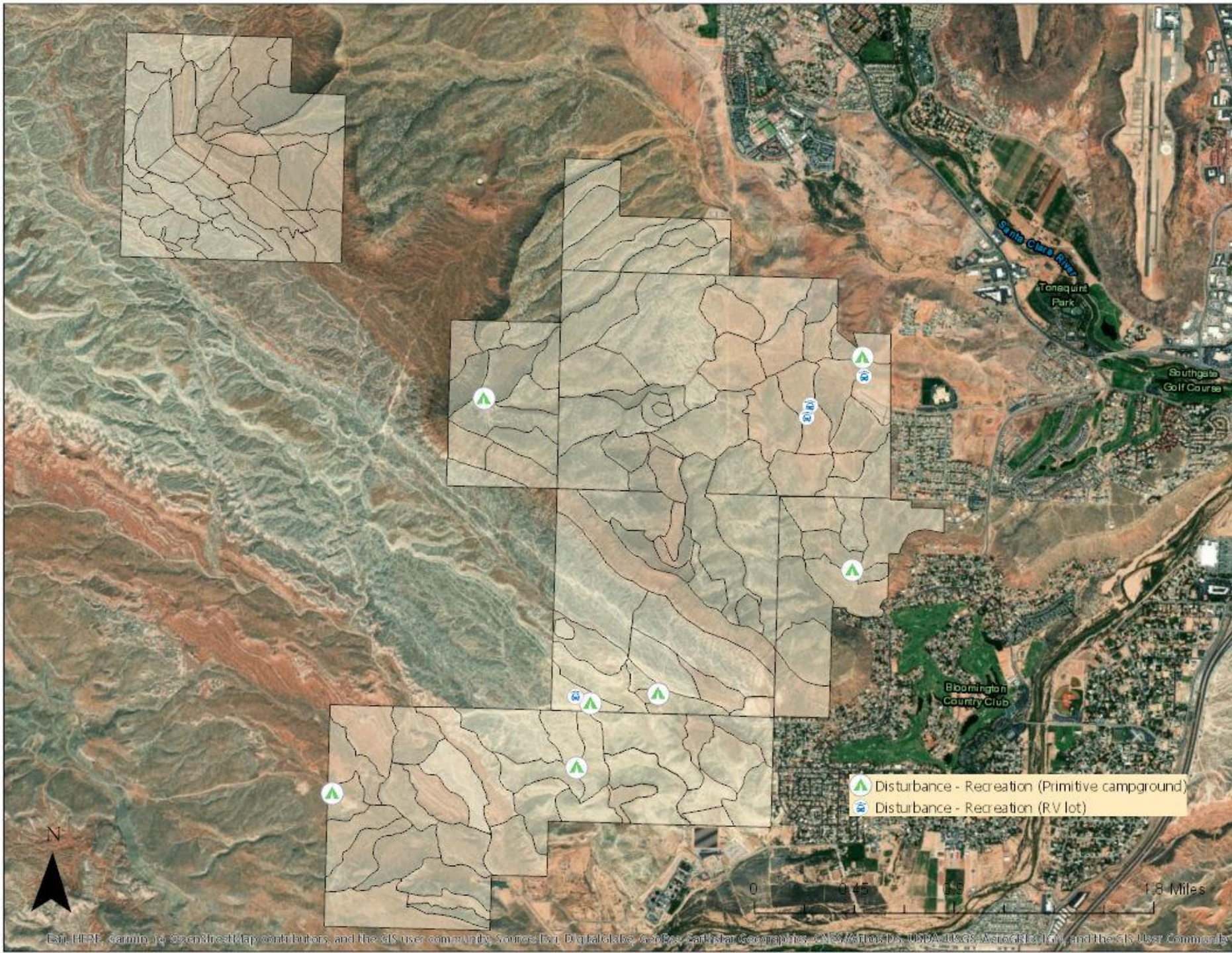
Climbing



Climbing and Campsites

- ✕ Disturbance - Recreation (Climbing)
- ✕ Disturbance - Recreation (Primitive campground)

Dispersed camping

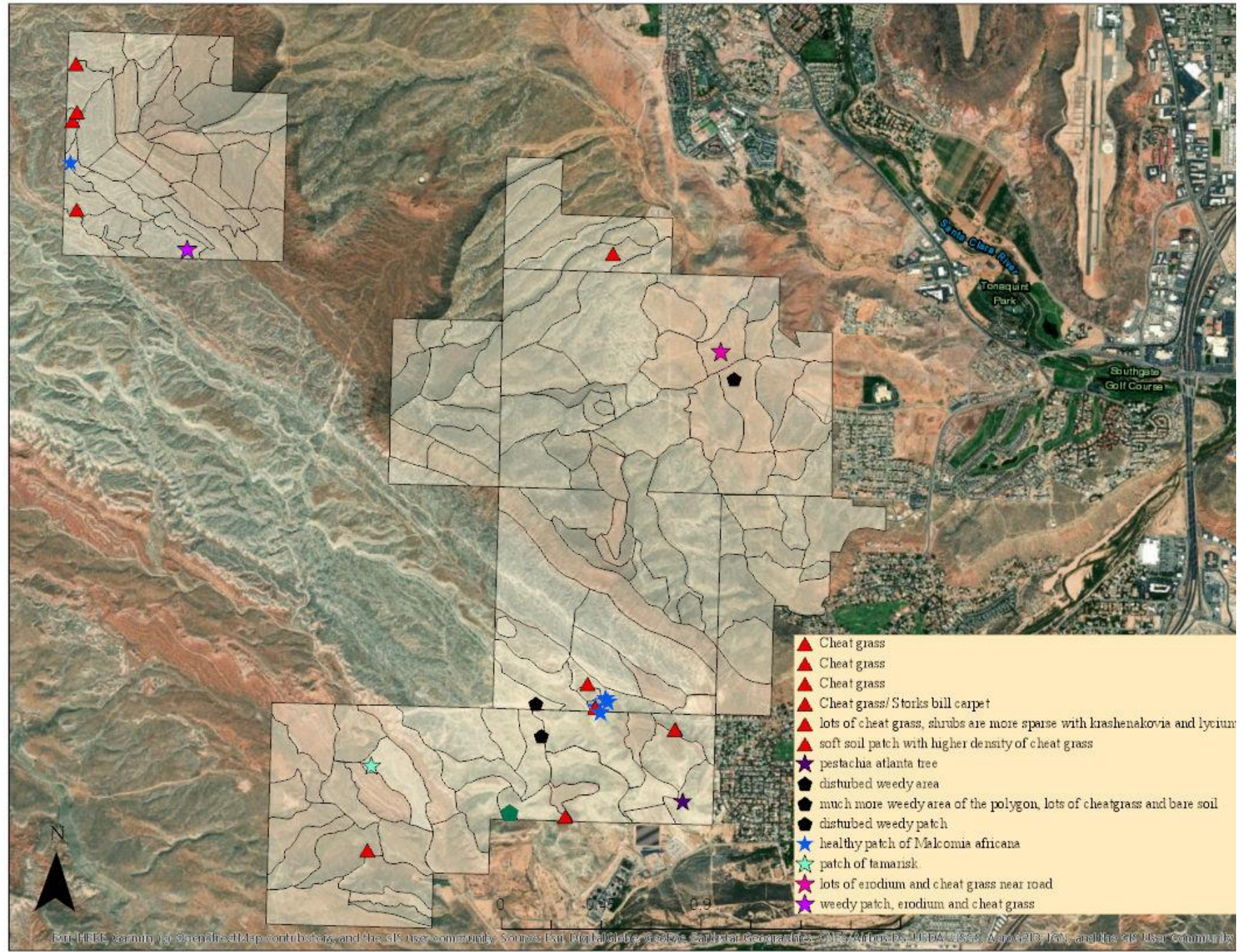


Dispersed camping



Uncommon Invasive Plant Species

- Tamarisk and Pistachia Species for high priority eradication
- Can be mechanically removed NOW





Pistachia atlantica – photo Ed Gilbert

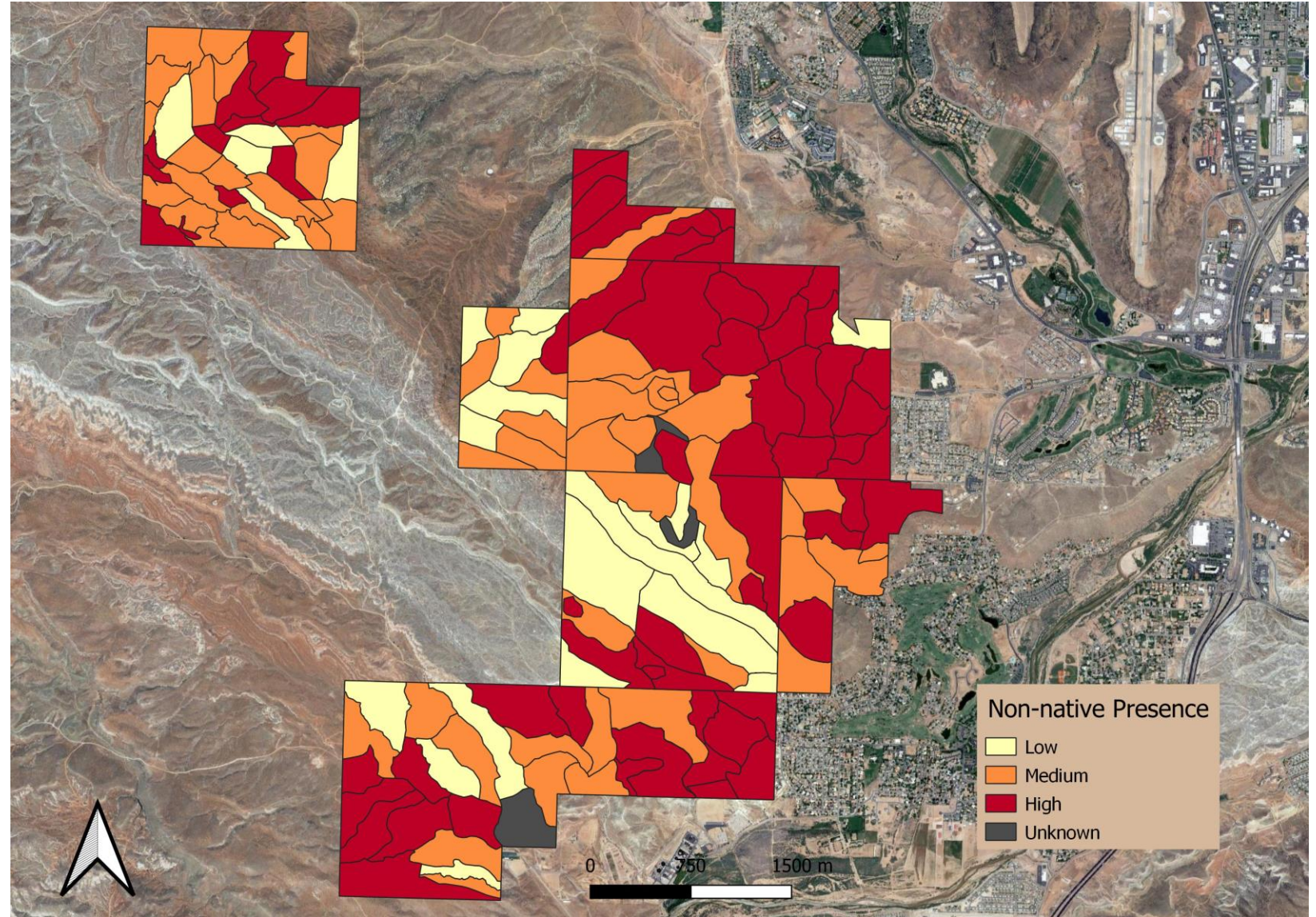


Tamarisk – LOCATION???

Invasive species Relative Presence

Recommendations:

- Protect areas that already have low or medium non-native presence (no new disturbance/ trails, etc)
- Signage to prevent off trail use for seed dispersal
- Regular weed surveys (Sahara mustard is a threat!)



Annual brome grasses can cause increased fire frequency/intensity
**Recovery from fires in the Mojave is extremely difficult and costly

Putting it all together for Effective Management

Balancing the needs of:

- (Increasing(?)) Recreation
(Camping, Biking, Climbing)
- Desert Tortoise
- Poppy
- Holmgren's milkvetch
- Gila Monster
- Invasive Species Control



PROTECT AREAS IN GOOD CONDITION!

Invasive Weeds:

- Conduct Regular Weed Surveys
 - Practice EDRR (Early Detection, Rapid Response for new weed species, new infestations)
 - Prioritize areas for active weed management
 - Prioritize areas for containment

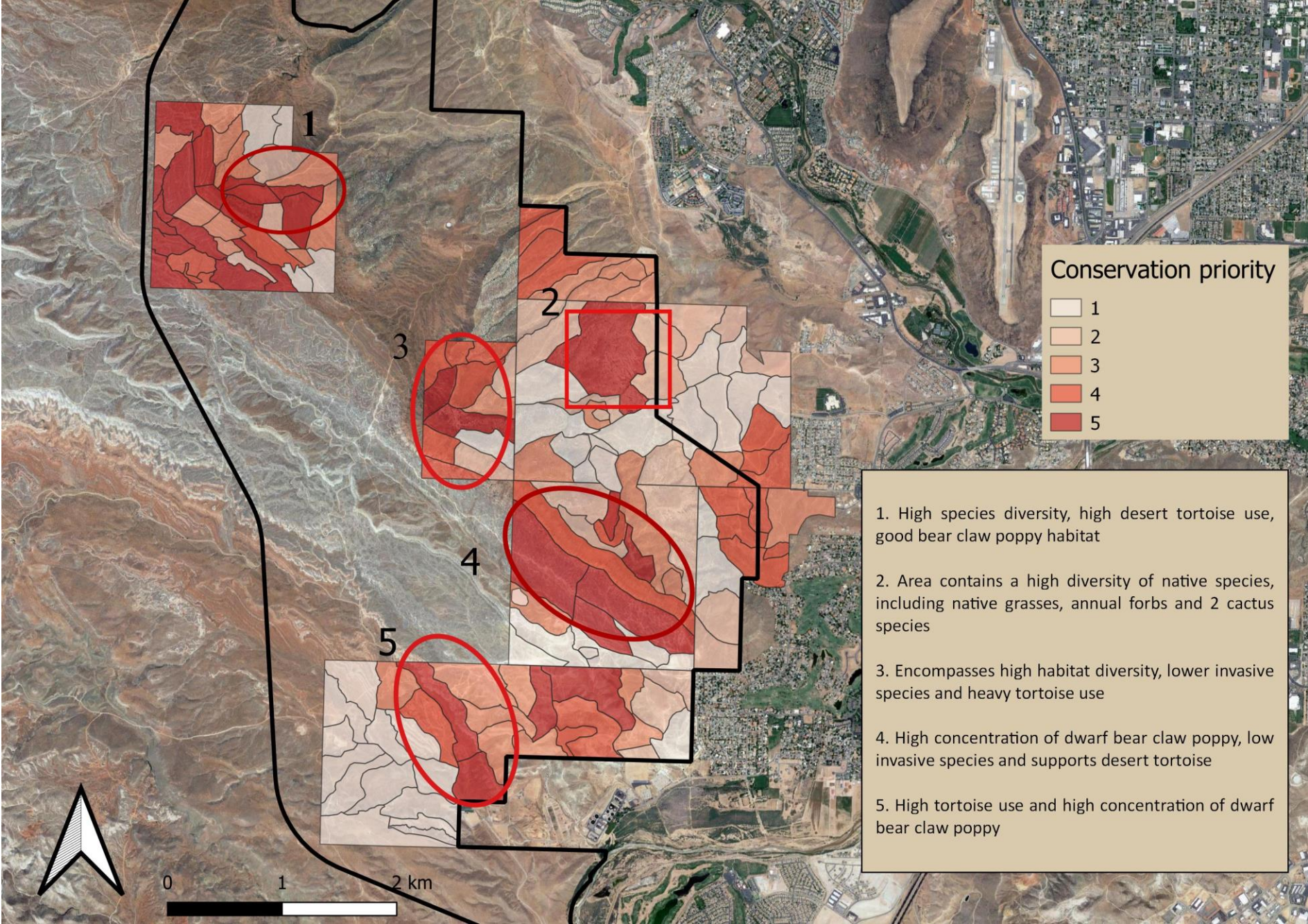
Recreation

- Recreation Management
 - Prioritize High Intensity Recreation (Signage, Enforcement)
 - Prioritize/ Stepwise Road and Trail Closures

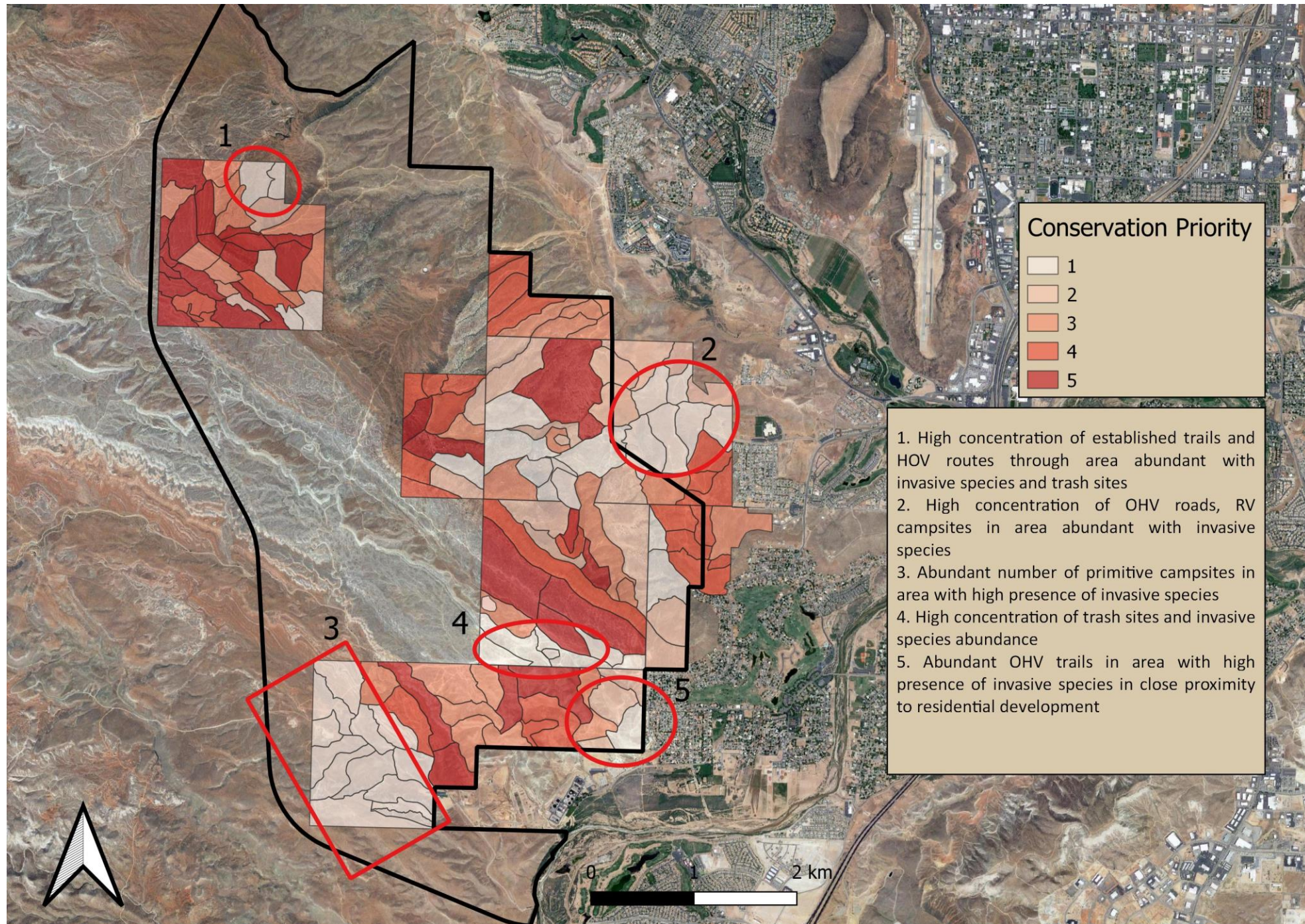
Species of Concern

- Prioritize habitat areas
 - Buffer Habitats as much as possible from trails, other disturbances

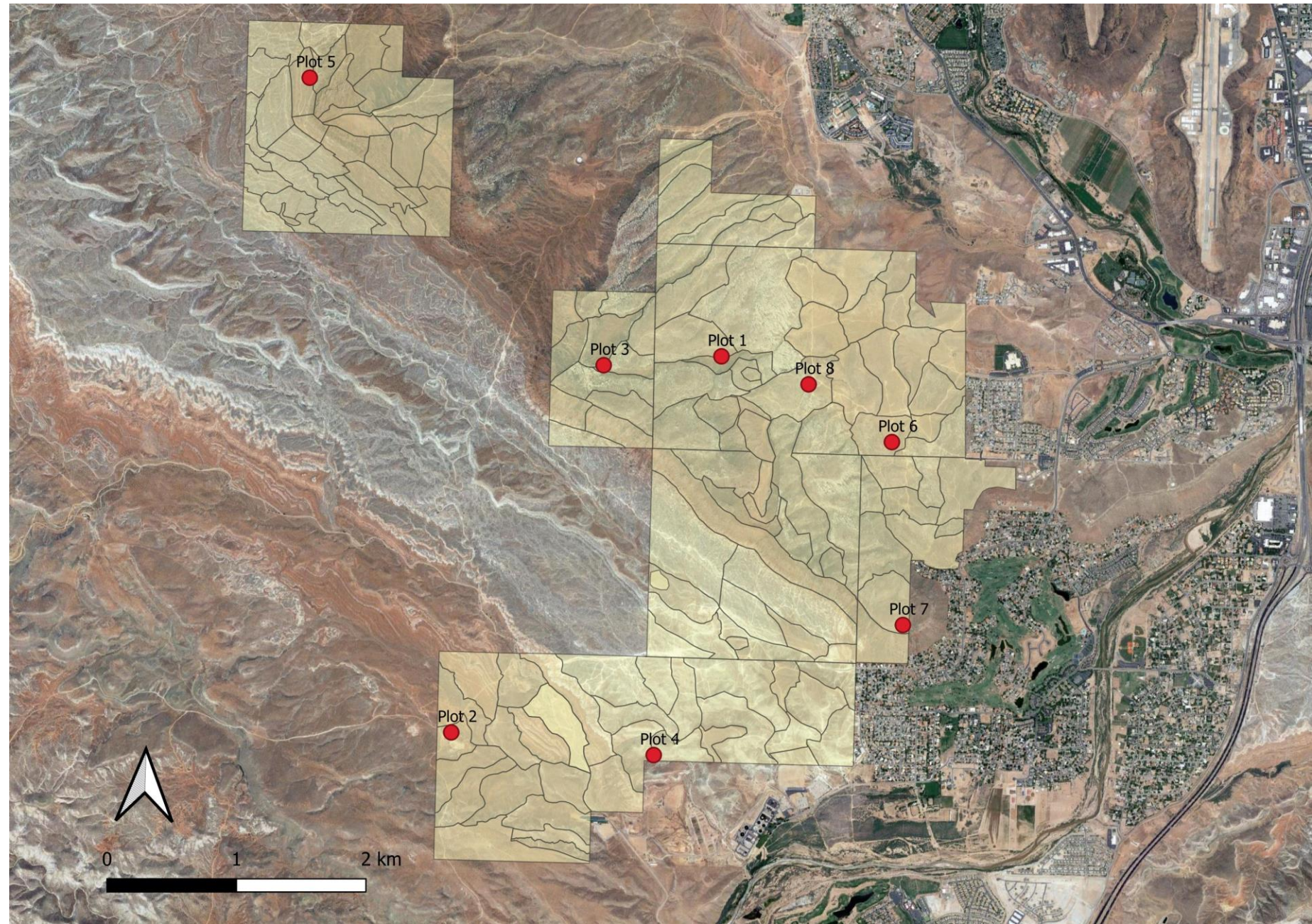
High priority areas



Low priority areas



Monitoring for ongoing information on how changes in management may maintain or improve vegetation communities

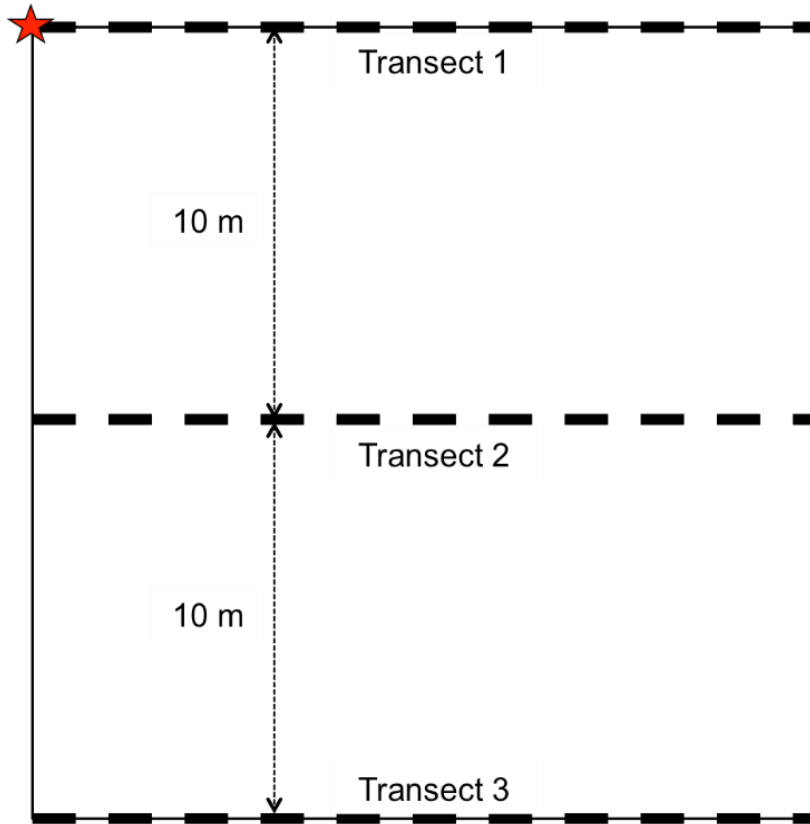


Vegetation Monitoring Plots

- Plots distributed throughout property
- Plots ranging from good, high native diversity to high invasive/poor condition

Plot	Reference Community	Condition
Plot 1	Burrobush Desert Dwarf Scrub Alliance	Good
Plot 2	Burrobush Desert Dwarf Scrub Alliance	Poor
Plot 3	Mojave Blackbrush Desert Scrub Alliance	Good
Plot 4	Creosotebush - Burrobush Bajada & Valley Desert Scrub Alliance	Poor
Plot 5	Colorado Plateau Torrey's Joint Fir Shrubland Alliance	Moderate
Plot 6	Creosotebush - Burrobush Bajada & Valley Desert Scrub Alliance	Moderate
Plot 7	Burrobush Desert Dwarf Scrub Alliance	Moderate
Plot 8	Burrobush Desert Dwarf Scrub Alliance	Poor

Example of Quantitative Data Collected



Tonaqui nt Pl ot 4	April 2019	n=3							
Life Form	Scientific Name	Common Name	Avg	St Deviation	St Error	Low	High	Relative Cover	Frequen
Warm season perennial grasses									
	<i>Pleuraphis rigida</i>	Big galleta	2.5	2.5	1.4	0.0	5.0	5.6	66.7
		Sub-total	2.5					5.6	
Annual grasses									
	<i>Bromus tectorum</i>	Cheatgrass	24.2	14.4	8.3	7.5	32.5	53.7	100.0
		Sub-total	24.2					53.7	
Perennial forbs									
	<i>Delphinium scaposum</i>	Pale larkspur	0.8	1.4	0.8	0.0	2.5	1.9	33.3
	<i>Erigeron spp</i>	Fleabane	0.8	1.4	0.8	0.0	2.5	1.9	33.3
	<i>Unknown Perennial Forb</i>		0.8	1.4	0.8	0.0	2.5	1.9	33.3
		Sub-total	2.5					5.6	
Introduced Annual Forbs									
	<i>Erodium cicutarium</i>	Crane's bill	11.7	7.6	4.4	5.0	20.0	25.9	100.0
		Sub-total	11.7					25.9	
Shrubs									
	<i>Ambrosia dumosa</i>	White Bursage	0.8	1.4	0.8	0.0	2.5	1.9	33.3
	<i>Hymenoclea salsola</i>	Burrobush	0.8	1.4	0.8	0.0	2.5	1.9	33.3
	<i>Larrea tridentata</i>	Creosote Bush	1.7	2.9	1.7	0.0	5.0	3.7	33.3
	<i>Lycium andersonii</i>	Anderson Wolfberry	0.8	1.4	0.8	0.0	2.5	1.9	33.3
		Sub-total	4.2					9.3	
Total Vegetation Cover			33.3	8.7	5.0	35.0	50.0		
Total Desirable Cover			9.2	3.8	2.2	5.0	12.5		
Mosses			2.5			2.5	2.5		
Lichen			5.0			5.0	5.0		
Litter			2.5			2.5	2.5		
Animal Scat			3.8	1.8	1.3	2.5	5.0		
Rock			10.0			10.0	10.0		
Gravel			23.8	21.0	12.1	2.5	40.0		
Total Ground Cover			80.8	17.7	10.2	65.0	100.0		
Bare Soil			19.2	7.2	4.2	22.5	35.0		

Quantitative Data for: Species Diversity and Shrub Density

Species richness			
Primary sub-quadrant (5x5)	Primary Quadrant (10x10)	Entire Plot (20x20)	
<i>Bromus tectorum</i>	<i>Acleisanthes nevadensis</i>	<i>Descurainia pinnata ssp. paysonii</i>	
<i>Erodium cicutarium</i>	<i>Coleogyne ramosissima</i>	<i>Pleuraphis rigida</i>	
<i>Astragalus nuttallianus</i>	<i>Sisymbrium altissimum</i>	<i>Atriplex confertifolia</i>	
<i>Krameria erecta</i>	<i>Malcolmia africana</i>	<i>Hymenoclea salsola</i>	
<i>Gutierrezia sarothrae</i>		<i>Eriogonum inflatum</i>	
<i>Ephedra fasciculata</i>		<i>Sphaeralcea ambigua</i>	
<i>Ericameria sp.</i>		<i>Delphinium scaposum</i>	
<i>Larrea tridentata</i>		<i>Dichelostemma capitatum</i>	
<i>Chorispora tenella</i>		<i>Opuntia erinacea</i>	
<i>Ambrosia dumosa</i>		<i>Cryptantha pterocarya</i>	
<i>Lycium andersonii</i>		Total	25

Also have 10 photo points per plot

Canopy Gap and Shrub Height			
Transect 1			
Scientific Name	Height	Start	Stop
<i>Ericameria sp.</i>	34	689	745
<i>Lycium andersonii</i>	65	1380	1456
<i>Ericameria sp.</i>	35	1561	1586
Transect 2			
Scientific Name	Height	Start	Stop
<i>Larrea tridentata</i>	1010	1566	1654
Transect 3			
Scientific Name	Height	Start	Stop
<i>Pleuraphis rigida</i>		341	370
<i>Pleuraphis rigida</i>		410	435
<i>Hymenoclea salsola</i>	38	605	650
<i>Hymenoclea salsola</i>	35	1630	1655
<i>Pleuraphis rigida</i>		1695	1736
<i>Ambrosia dumosa</i>	32	1879	1951
<i>Hymenoclea salsola</i>	48	1879	1951

Future Tasks?

- Similar level of mapping effort on adjacent lands to help manage lands consistently
- Weed Management Plan
- Restoration Prioritization
- Continue monitoring efforts (weed presence and plots)

Thank you!!!

Questions?



UtahStateUniversity

