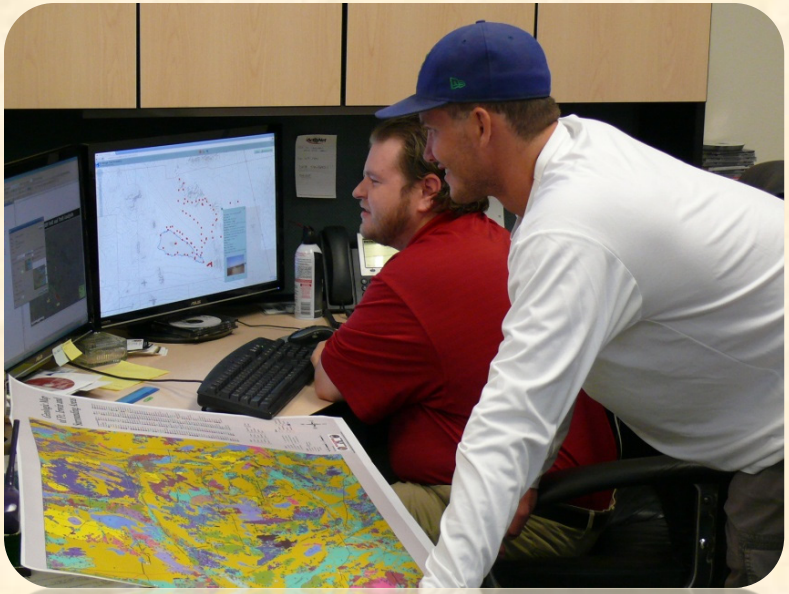
El Mirage Off-Highway Vehicle (OHV) GIS Pilot Project



Shane McKinley
GIS Intern
American Conservation Experience (ACE)

Project Partners

- California State Park OHV Grant
- Hungry Valley State Vehicular Recreation Area (training)
  - Species Data Collection
  - Plant Inventory
  - Photo Points
  - Route Monitoring
  - Checked Traps
  - Trail Maintenance (proper width, grading trail)
- DMG's Mojave Desert Ecosystem Program (MDEP)
- American Conservation Experience (ACE)
- BLM Barstow Field Office

The goal of this collaboration was to utilize available technology to assist in GIS data collection and improve the process where possible.

Needs Assessment

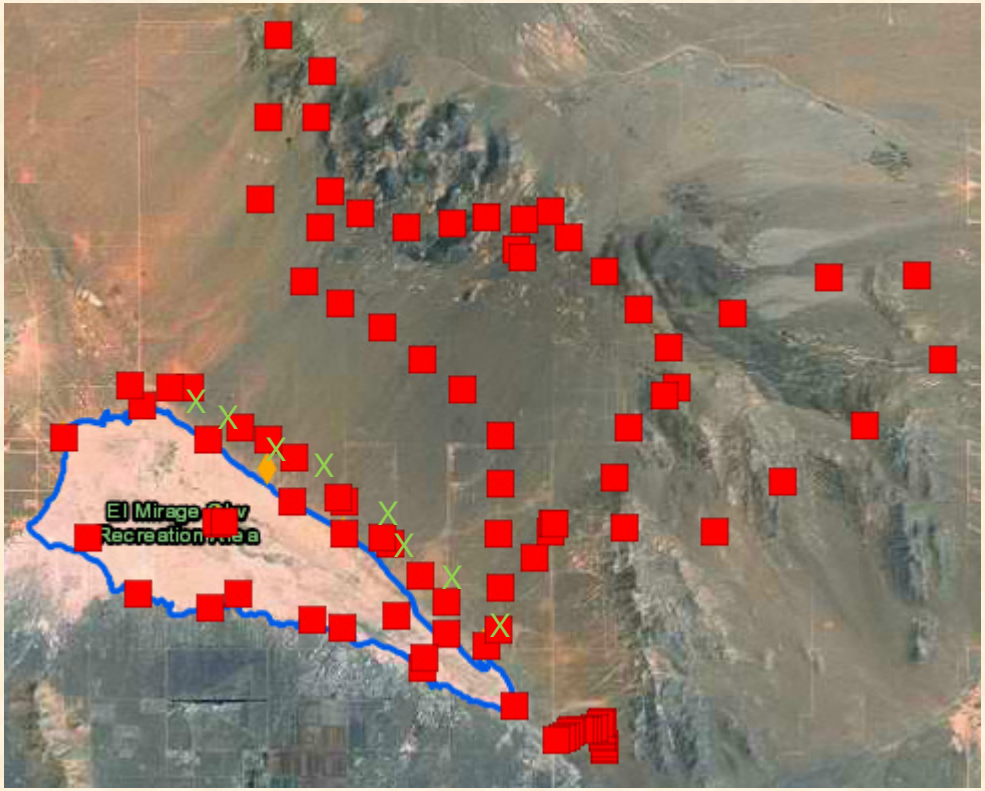
- Old Data
  - 2001, polaroid photos
- Understaffed
  - Lacked staff availability to devote to the project
- Process
  - Hand written paper process—2 forms
- Remote Location
  - 1 hour from Field Office

Conduct a GIS Trail Inventory and Condition Assessment of the El Mirage OHV Area to meet the requirements of the California OHV grant program

El Mirage GIS Pilot Project

20+ miles of roads and trails throughout the 25,000 acre OHV park

-East Loop Trail
-West Loop Trail
-Mountain View Rd
-Access Points
-Landmarks
ex: vault toilets



5,000 acres of dry lakebed: checked surface conditions

Collection points follow baseline data from 2001

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The Process: Data Collection

OHV Trail Condition Evaluation Form

Trail Name _____ Trail No. _____ Vehicle Type: MC ATV 4x4 SM Trail Difficulty: easiest, more difficult, most difficult

USGS Quad _____ Planning Watershed _____ Begin Segment _____ End Segment _____

Site Characteristics: Soil/Geology _____ Vegetation _____ Side Slopes: 0-30% 30-50% >50%

RATING (G,Y,R) _____ GPS Ref _____ Avg Trail Slope ___% Max Trail Slope ___% Rated By _____ Date _____ Reviewed By ____ Date ____ Page __ of __

Section B = Begin E = End	Section Length	Trail slope	Crossings LA	CS	RA	Condition Codes	Cause Codes	Comments	Photograph Numbers
B E									
B E									
B E									

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What was accomplished?

- **Over the course of 4 months**
  - All trails were identified, graded and documented on a detailed soil report. (GYR scale)
  - Over 25,000 acres covered
  - Roughly 90 photo points documented throughout OHV area.
  - Photo points that were documented displayed:
    - Trail name, Trail #, Trail difficulty, USGS Quad
    - Also: soil geology, vegetation cover, slope of trail and trail rating (GYR)

Trail Name	Trail Number	Vehicle Type	Trail Difficulty	USGS Quad	Beg. Segment	End Segment
Lakebed 2	2	ATV, MC, 4X4	Easiest	T6N, R7W, Sec1, SW ¼, NW ¼, NW ¼	34.62275 lat -117.565348 long	100 m. north of start point

Soil Geology	Vegetation	Side Slopes	Rating	Avg. Trail Slope	Max Trail Slope	Comments
Sand	creosote bush, Joshua tree	0-30%	G	4.0%	10%	Trail in great condition and vegetation thriving up to trail ridge

2012 El Mirage OHV Area Code Key

Green		Yellow		Red	
G1	**Water control** effectively disperses runoff from the trail before it has the volume and velocity to cause erosion. Where present, rills are shallow and show minor erosion.	Y1	Water breaks do not divert all runoff from the trail because they are nearly filled to capacity and/or are partially breached, or spaced too widely. Where present, rills crossing trail is showing erosion.	R1	Water breaks no longer divert runoff from the trail because they are full and/or have been breached, or are absent or spaced too widely. Gully erosion is occurring and shows potential hazards.
G2	**Vegetation**, where present, is showing little to no sediment traps along trail and sediment is dispersed evenly throughout vegetation floor.	Y2	Vegetation, where present, is showing sediment traps along trail. Sediment is still dispersed evenly throughout vegetation floor.	R2	Vegetation, where present, has large accumulation of sediment trapping and sediment traps are preventing even distribution throughout vegetation floor.
G3	**Berms, Whoops, or Stutter Bumps** are <6 inches and show minor widening by OHV avoidance.	Y3	Berms, Whoops, or Stutter Bumps are between 6 – 12in. and trail is widened by 1.5X's by OHV avoidance.	R3	Berms, Whoops, or Stutter Bumps are >12 inches, and trail is widened by 2Xs by OHV avoidance.
G4	**Tread width** is generally no greater than 1.5 times the design width for the designated use.	Y4	Tread width is generally greater than 2 times the design width for the designated use and appears to be increasing.	R4	Tread width is generally greater than 3 times the design width for the designated use and has caused or is causing erosion, sedimentation, and damage to vegetation.
G5	**Depression** in trail from wind and water erosion shows minor increase in soil depth.	Y5	Depression in trail is 2-3ft. Wind and water erosion is evident and affects runoff disbursement.	R5	Depression in trail is >3ft. Continuous wind and water erosion are causing channeling of water and high levels of erosion.
G6	**Approach to trail** section shows no damage to riparian or outside thread width	Y6	Approach to trail section shows some evidence of erosion and may show evidence of widening. Minimal damage to riparian vegetation.	R6	Approach to trail section shows tread is unstable and shows evidence of accelerated erosion. Approach may be widening and damaging riparian vegetation.
G7	**Channel Section** has only minor channel widening, minor bank erosion, no bars.	Y7	Channel Section has widened moderately, modest bank erosion, modest lateral and/or mid-channel bars.	R7	Channel Section has widened significantly, extensive bank erosion, large lateral and mid-channel bars.
G8	**Stress Cracks** are minor and are not hazardous to OHV riders	Y8	Stress cracks are moderate and section should be monitored	R8	Stress cracks are deep and considered hazardous to OHV riders

	Cause Codes		Cause Codes
C1	Cascading runoff from an impervious trail or road slope	C6	High intensity storm/flash flood runoff
C2	Wet area caused a depression	C7	Berms, whoops, stutter bumps
C3	Excess soil moisture at time of OHV use	C8	Crossing alters stream channel
C4	Erosion caused by slope of terrain or amount of OHV use	C9	Segment not designed for type and amount of use occuring
C5	Mechanical erosion makes maintenance ineffective	C10	Shrink/Swell phenomena

Maintenance Data

APPENDIX 3: MAINTENANCE AND EVALUATION OF TRAIL CONDITIONS

Mechanized Construction - Maintenance Checklist

Trail Name _____Trail No._____ Segment No. _____

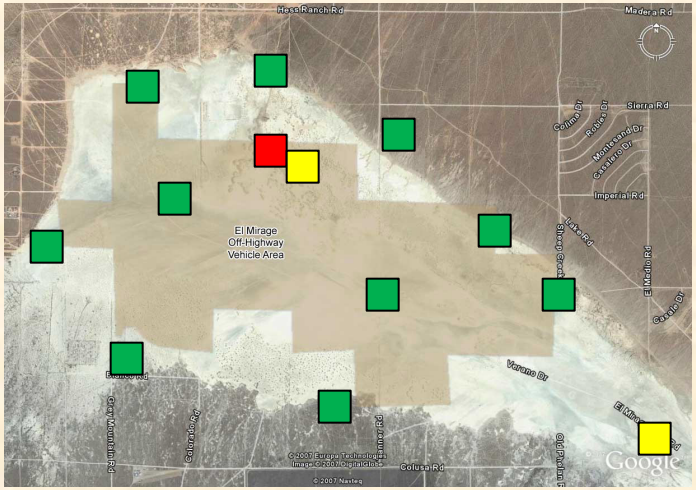
Trail Difficulty easiest more difficult most difficult Max Trail Slope ___% Ave Trail Slope ___%

Activity: maintenance reconditioning new construction Side Slope:____%
Drainage: Outslope Rolling Dip Confined Flat Other_____
Equipment: Hand Trail Tractor Mini-excavator Other_____
Soil Type: clayey loamy sandy Rock Fragments (%): <15 15-50 >50
Soil Depth: shallow deep Vegetation Type: _____ Photo Numbers: _____
Operator _____ Assistant(s) _____Date _____
Last Maintenance (mo/yr) _____ Maintenance Type : Hand Mechanical
Notes:

Guideline	Yes	No	N/A
1. This checklist was reviewed before starting maintenance or construction on this trail			
2. Prior to mobilization the completed OHV Trail Condition Evaluation Forms were reviewed and trail segments, sections, or features needing maintenance or reconditioning were confirmed.			
3. Equipment was operated by certified operators, or under direct supervision of certified operator			
4. If new, this trail was constructed to Guidelines			
5. OHV rolling dips were constructed/maintained by compacting moist soil in lifts no greater than 4 inches loose thickness			
6. Prior to mobilization, need for maintenance with mechanical equipment was validated			
7. The blade was lifted and the equipment walked across sections of trail that needed no maintenance			
8. Soil collected in rolling dip outlets was recycled into rolling dip structures or back onto the trail tread			
9. Berms were worked back into the trail tread, not bladed off the trail as sidecast			
10. Rills and gullies in treads were repaired with soil reclaimed from rolling dip outlets or from outside berms, not by blading the trail tread			
11. Soil sloughed from cutbanks or sideslopes above the trail was bladed only as needed to maintain a safe trail; cutbanks were not bladed into or undercut			
12. Whoops and stutter (braking) bumps were repaired by ripping, blading, and compacting trail treads when soil was moist (except for non-cohesive soils)			
13. The amount of soil moved was the smallest amount needed to meet the maintenance objective			
14. Where soil was too dry for compaction, maintenance was deferred or done by hand			

Duties Performed

- Maintenance on the lakebed as well as the trails.
- Developed a soil conservation plan for the El Mirage OHV Area
- Developed a trail maintenance plan for the El Mirage OHV Area
- Assessed trails and lakebed health
- Finalized a soil report for the El Mirage OHV Area



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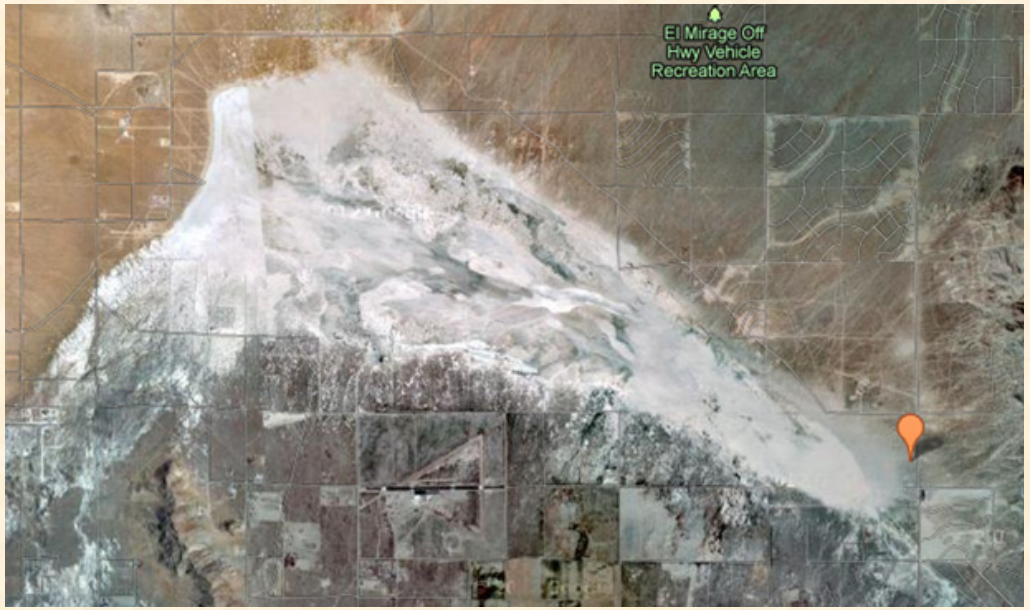
Project Outcome

- More efficient method of data collection and transmission—secure and cost effective
- Online data sharing with the ability to manage GIS data, photo data and form data in one package
- Ability to share GIS information without having to travel long distances.
- Allowed for a jump start on the next grant cycle. GPS points and pre and post photos are now a requirement.



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Building for the Future at El Mirage

- Keep our lakebed and trails healthy (It's a destination spot for 80,000-100,000 people)
- We are currently working on providing alternate routes onto the lakebed (lakebed access points) and ongoing maintenance
- Create a plant & animal species inventory that can be viewed online with our pilot project trail data

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Thank you for your support

http://mdepgis00.mojavedata.gov/blm_trail_inventory/

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