



A COMPARISON OF THE VEGETATION COMMUNITIES ON GEOMORPHIC AND NON-GEOMORPHIC RECLAIMED MINE LANDS IN NORTHWESTERN NEW MEXICO

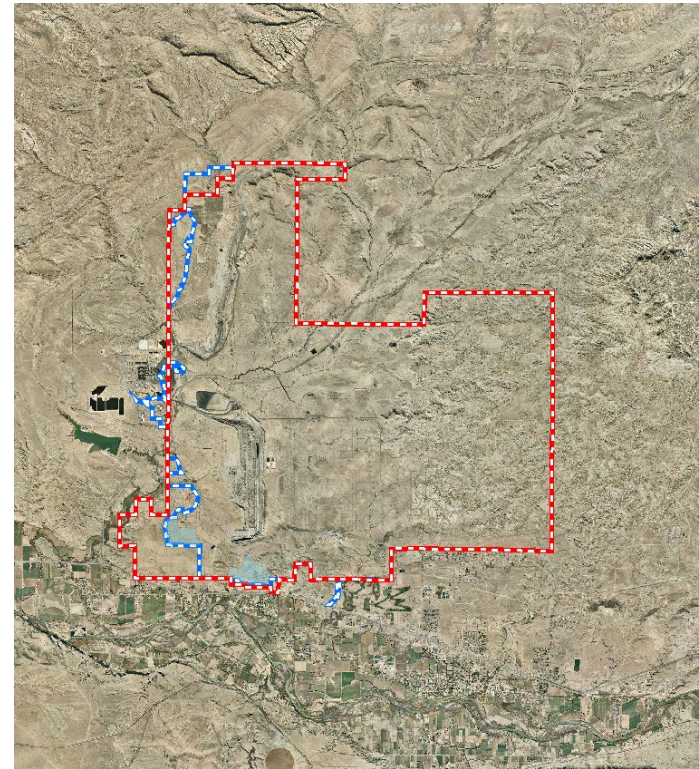
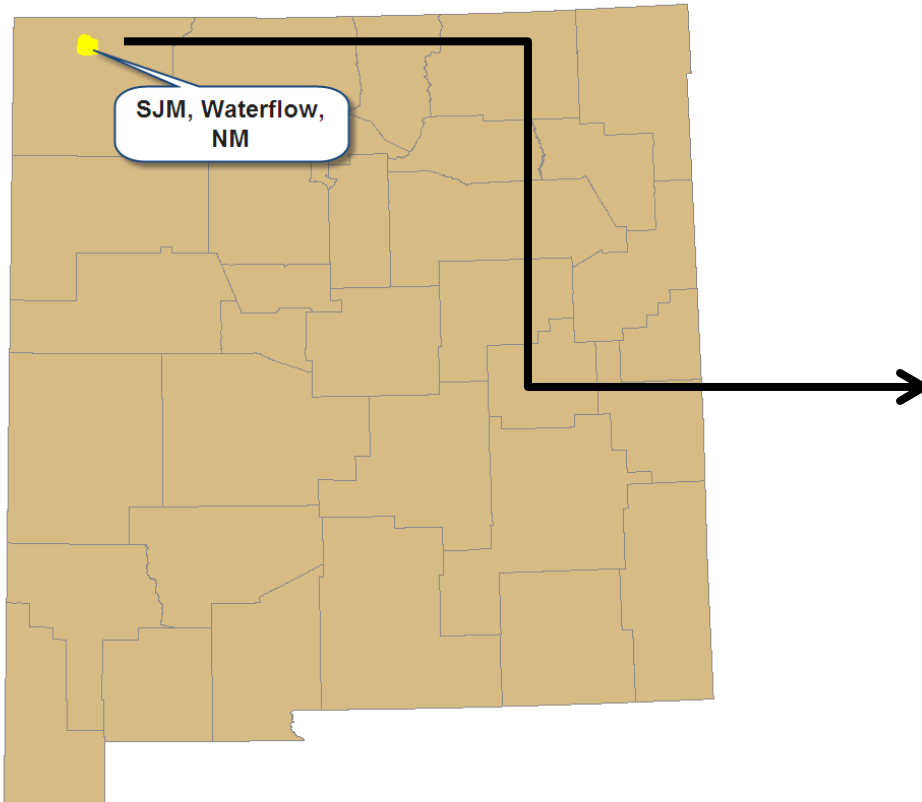
Tim Ramsey and Joshua Voss
BHP Billiton
March 2013



Geomorphic and Non-geomorphic Vegetation Comparison

Introduction

- San Juan Mine (SJM)



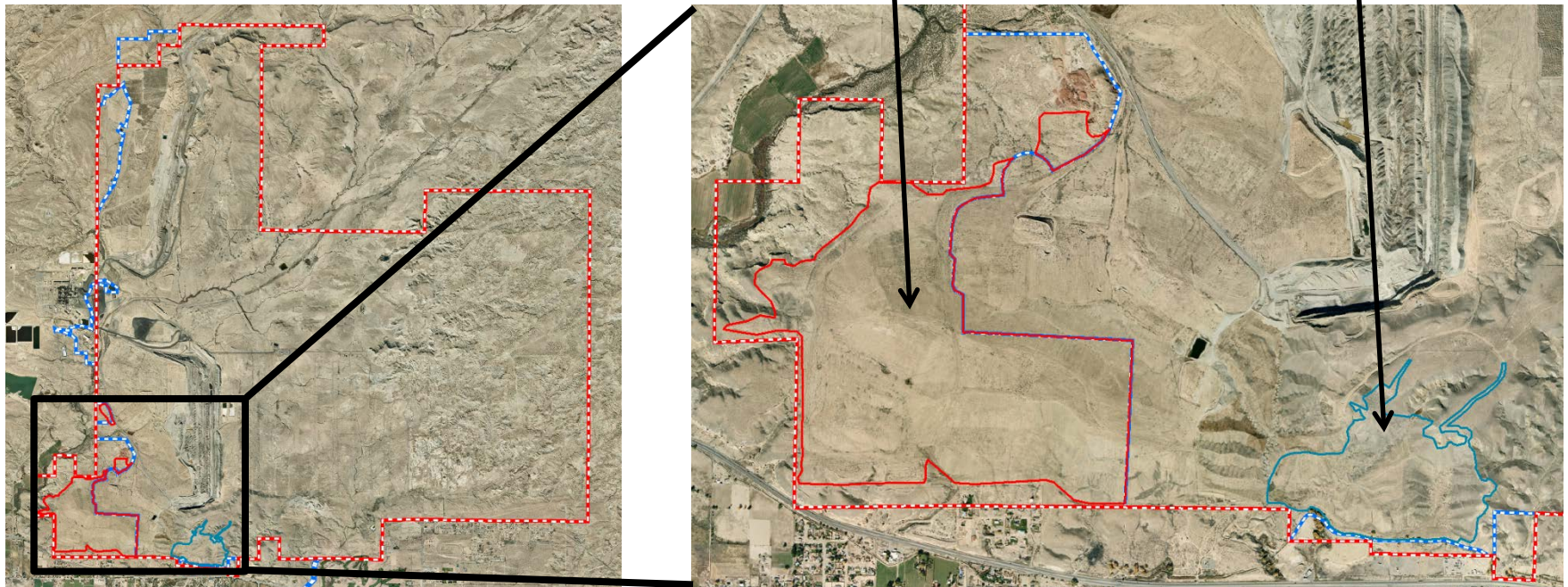
Geomorphic and Non-geomorphic Vegetation Comparison

Introduction

- San Juan Mine (SJM)

Non-geomorphic
reclamation (West
Gravel Hill or **WGH**)

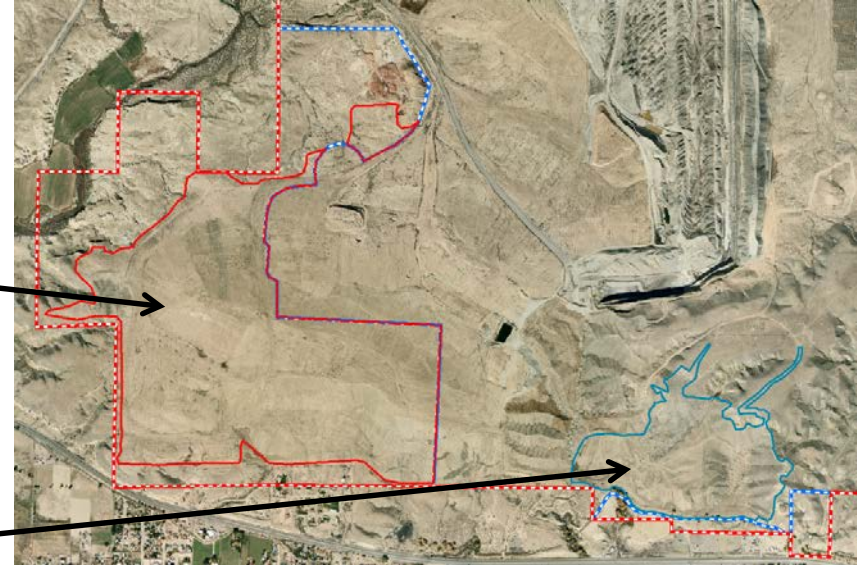
Geomorphic
reclamation
(Cottonwood south
east or **CWSE**)



Geomorphic and Non-geomorphic Vegetation Comparison

Introduction

- San Juan Mine (SJM)
 - WGH
 - Non-geomorphic
 - Approximately 450 acres
 - Seeded 1986-1992
 - Vegetation sampled 2001-2003
 - CWSE
 - Geomorphic
 - Approximately 122 acres
 - Seeded 2002
 - Vegetation sampled 2012

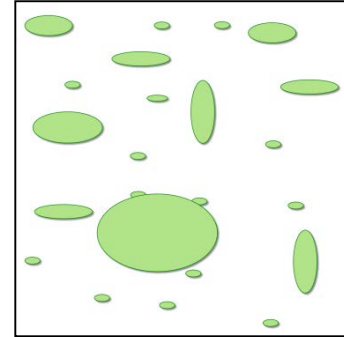


Geomorphic and Non-geomorphic Vegetation Comparison

Procedures

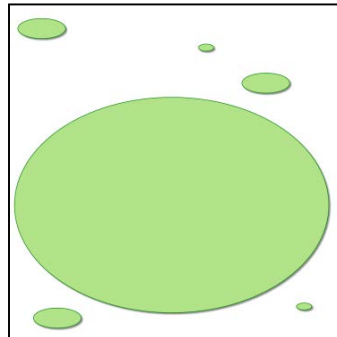
Cover

Percent of the surface that is covered by vegetation and/or litter



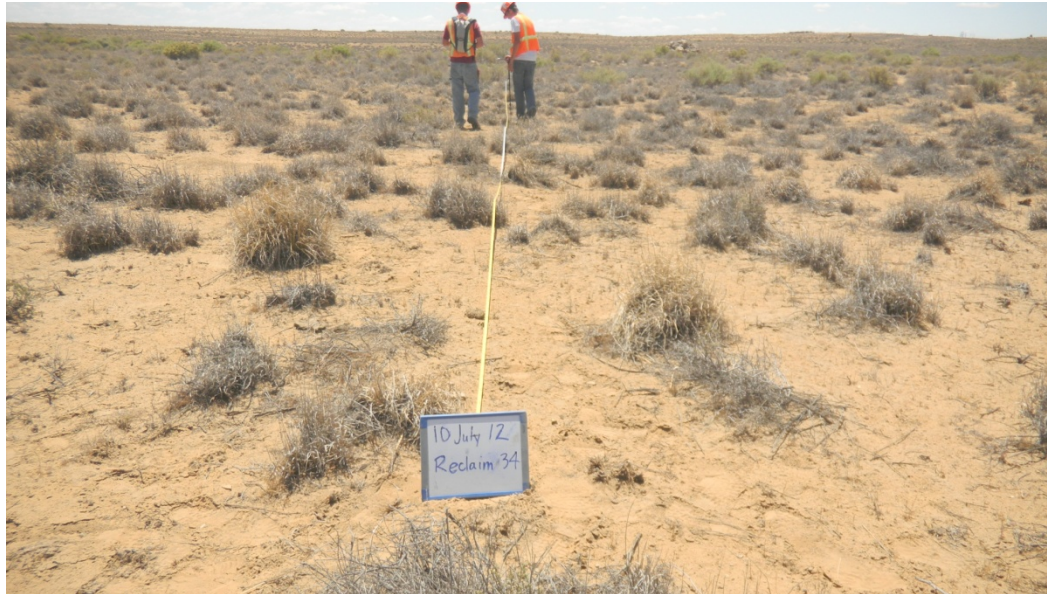
Density

Number of plants per unit area



Geomorphic and Non-geomorphic Vegetation Comparison

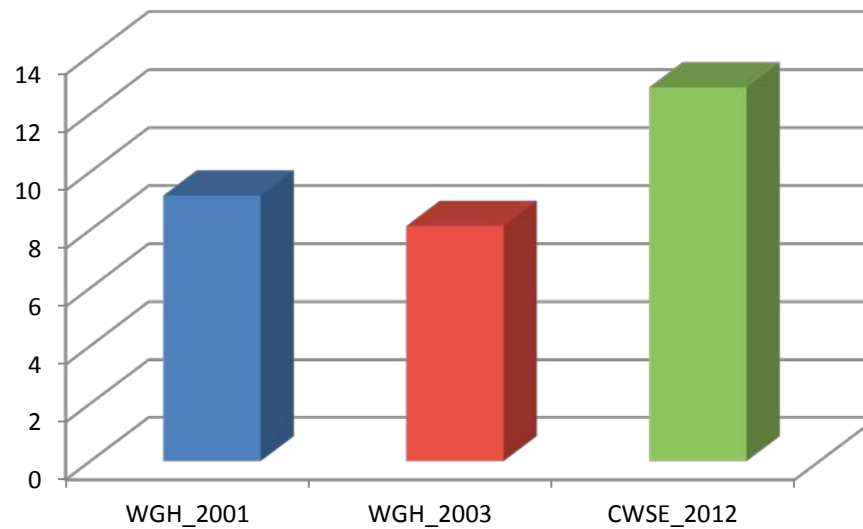
Procedures



Geomorphic and Non-geomorphic Vegetation Comparison

Results

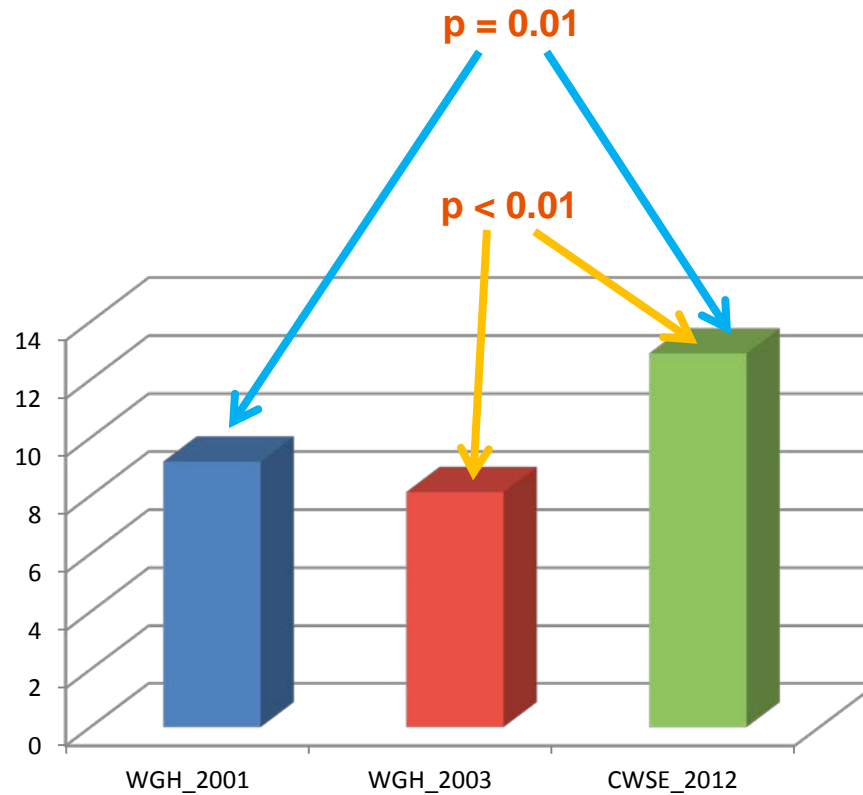
Perennial cover (%)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

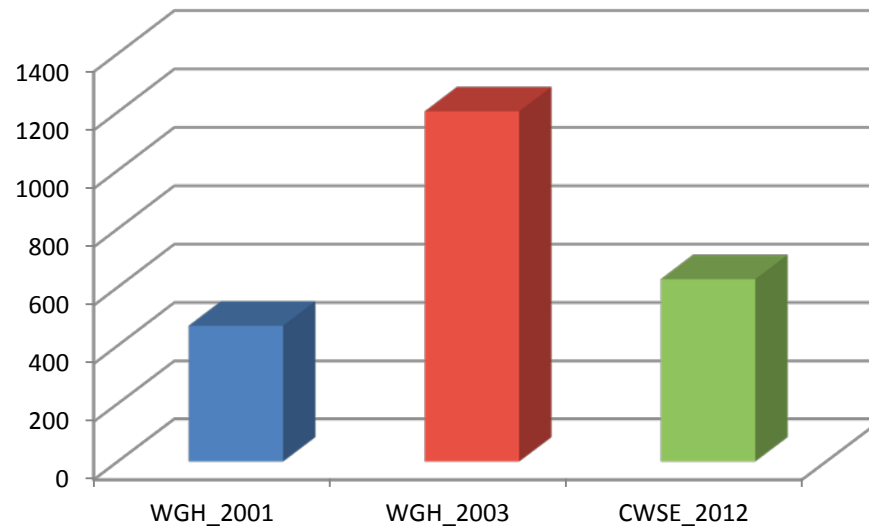
Perennial cover (%)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

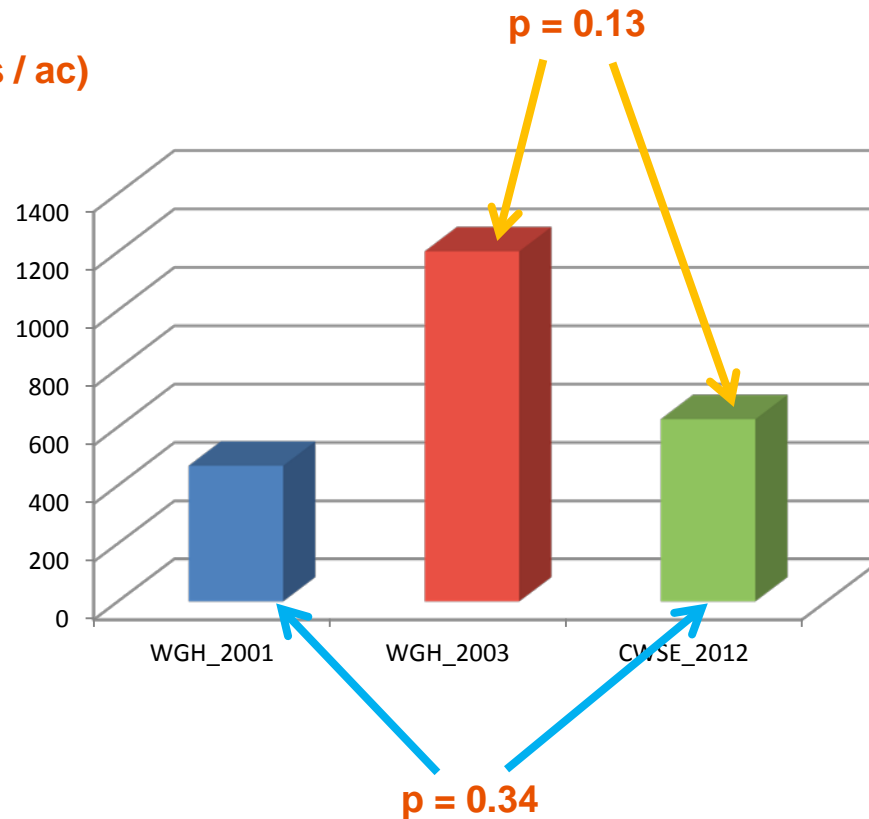
Shrub density (shrubs / ac)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

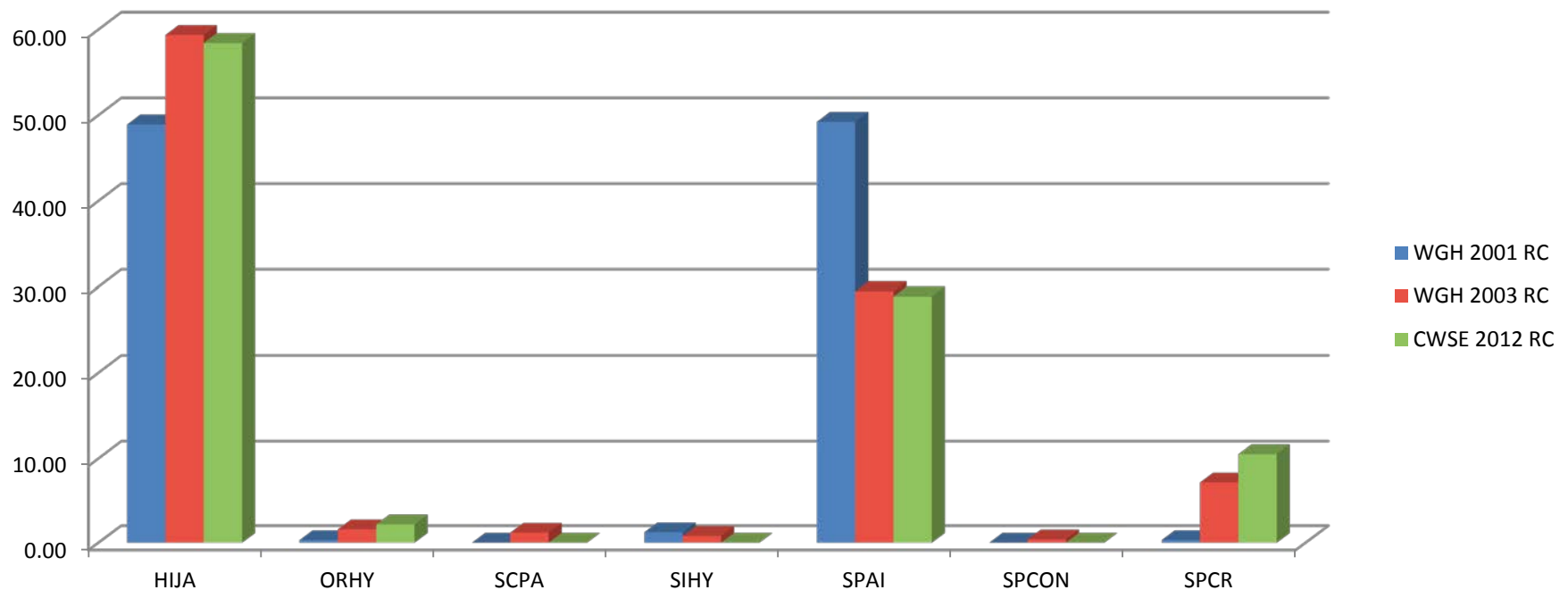
Shrub density (shrubs / ac)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

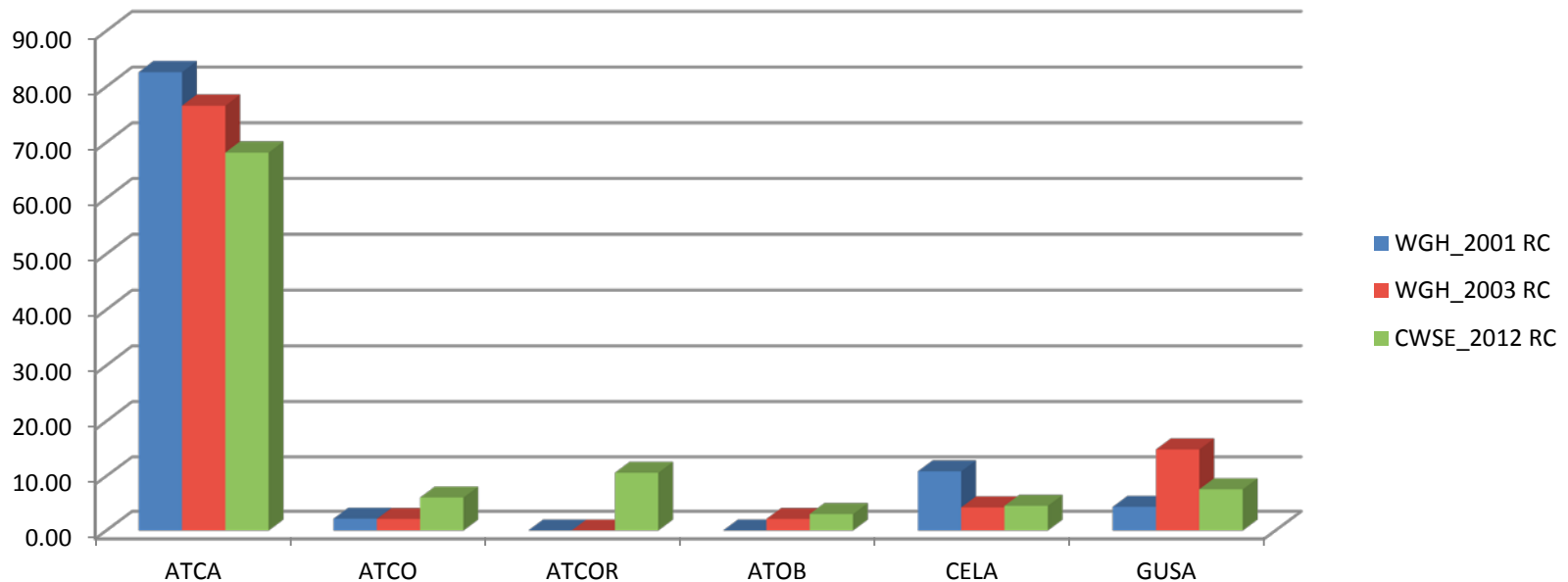
Relative perennial grass cover (%)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

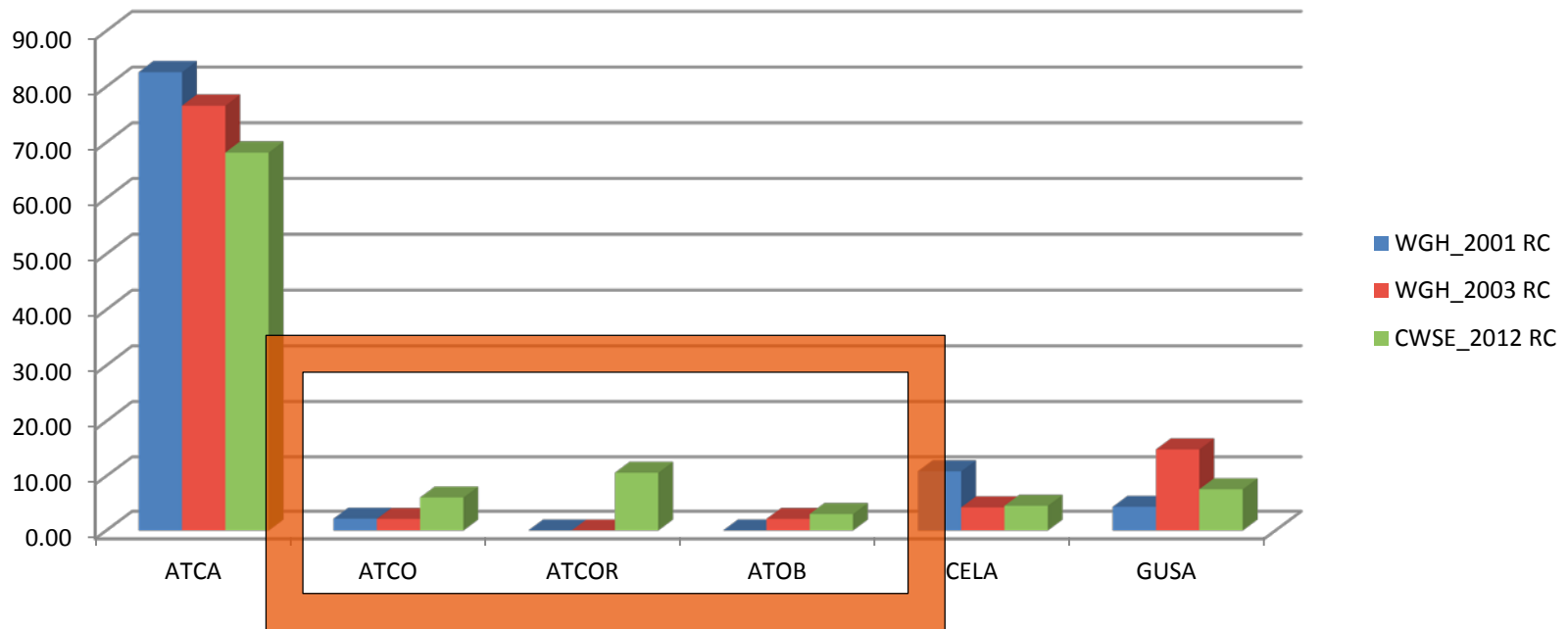
Relative shrub cover (%)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

Relative shrub cover (%)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

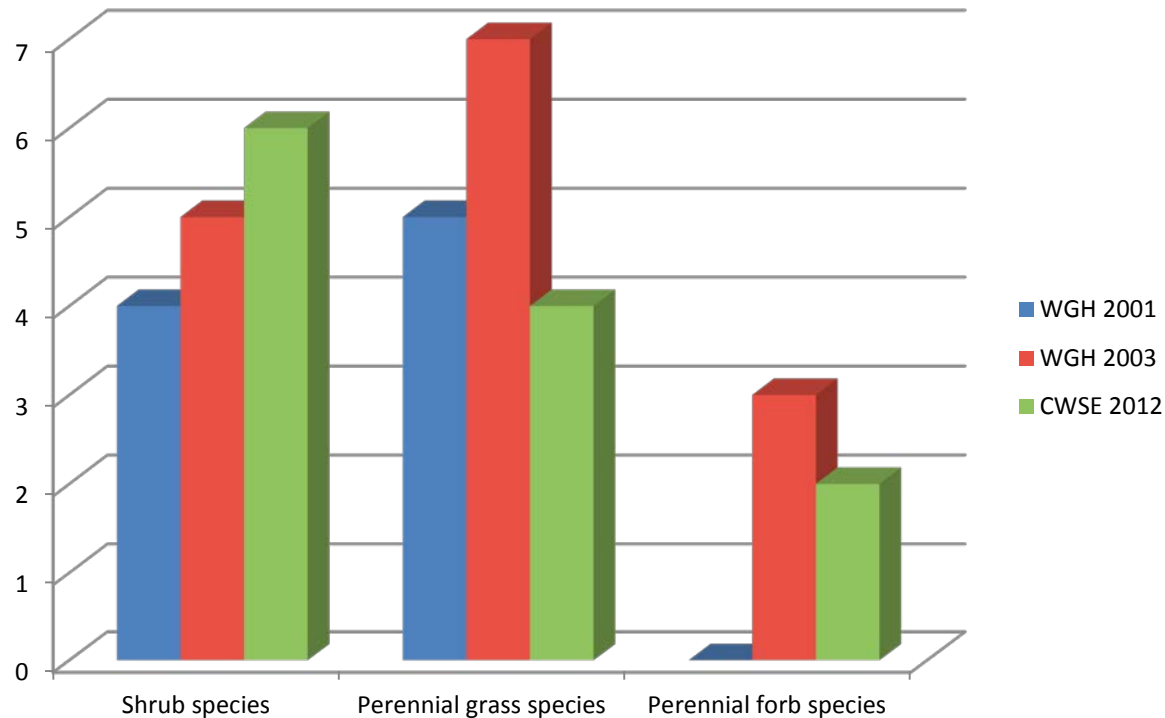
Relative shrub cover (%)



Geomorphic and Non-geomorphic Vegetation Comparison

Results

Number of species



Conclusions

- 1) Perennial cover was significantly greater on the geomorphic vs. the non-geomorphic area
- 2) Shrub density not significantly different in the geomorphic vs. the non-geomorphic area
- 3) Overall species composition was similar; the geomorphic landscape possibly favors shrub species diversity while the non-geomorphic area possibly favors perennial grass species diversity

Geomorphic and Non-geomorphic Vegetation Comparison

Further work

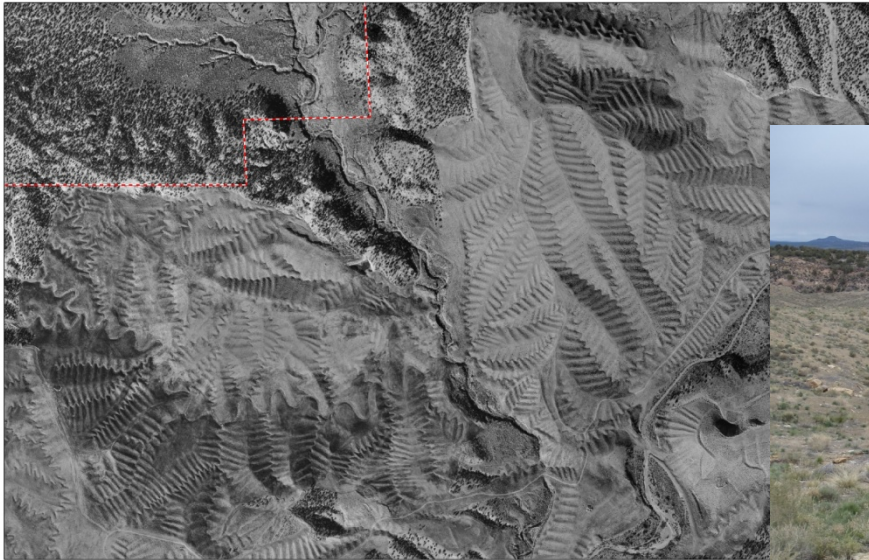
- 1) Continued sampling of geomorphic and non-geomorphic areas at San Juan Mine



Geomorphic and Non-geomorphic Vegetation Comparison

Further work

- 1) Continued sampling of geomorphic and non-geomorphic areas at San Juan Mine
- 2) Initiation of sampling of geomorphic areas at La Plata Mine



Geomorphic and Non-geomorphic Vegetation Comparison

Questions?





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resourcing the future