

Assessing, Quantifying and Monitoring Arroyo Restoration at Rio Mora NWR

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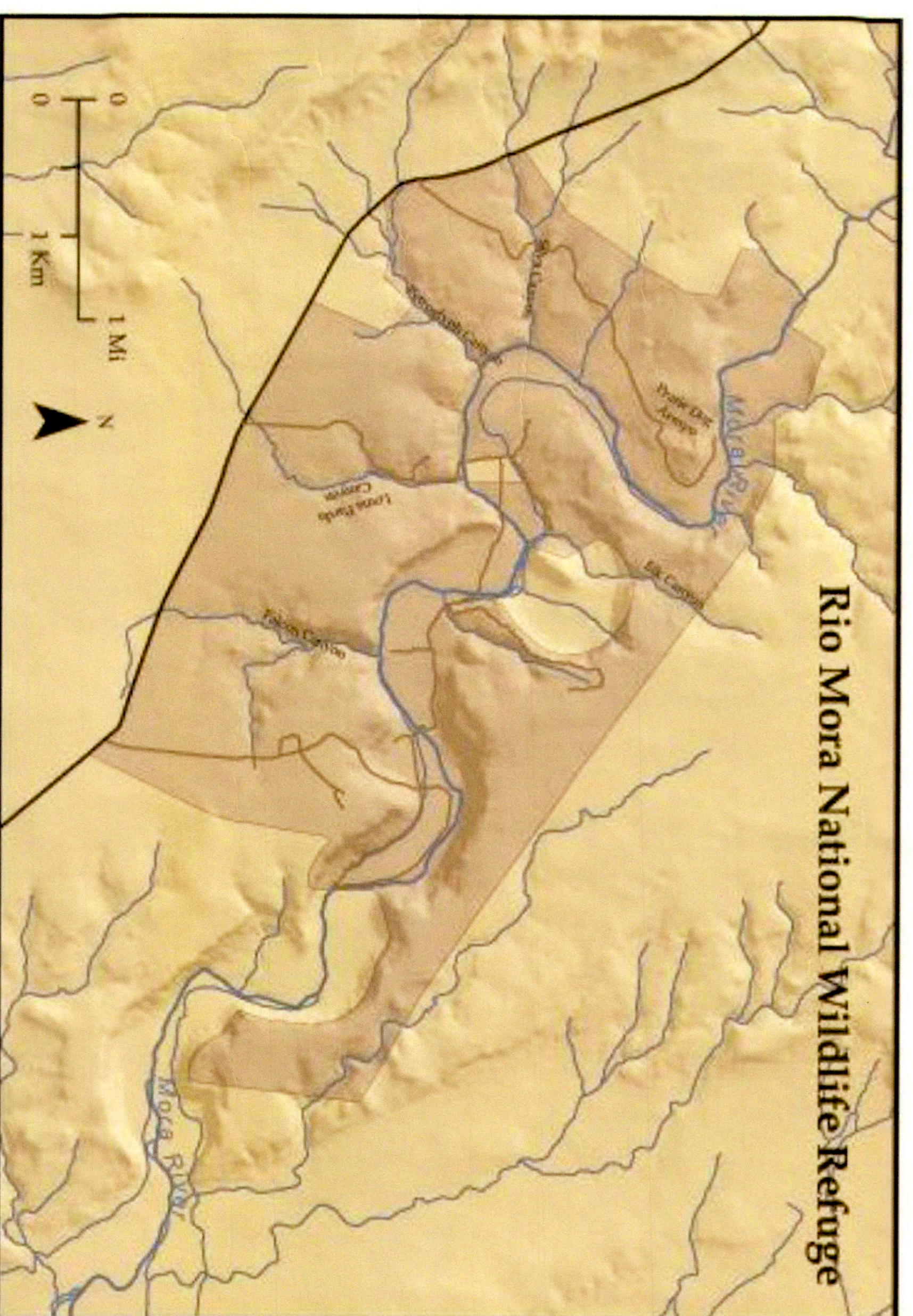
Introduction

- Arroyos are highly erosive land features in the Southwest.
- Causes of erosion include overgrazing, human impact, drought, or changes in land use.
- Riparian systems are on the decline; 75-80% of vertebrate species depend on wetlands.
- Grade control structures are used in arroyo restoration to capture sediment and reduce flow velocities.

Objectives

- Quantify the restoration of hydrologic processes in rehabilitated arroyos.
- Quantify the conditions created by restoration efforts for native flora and fauna.

Study Site



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Methods

1. Sub-watershed and Drainage Area:
 - Establish baseline estimates of catchment area and vegetative conditions from high-quality aerial photographs and LIDAR data
2. Weather:
 - Variables that contribute towards flows and evaporative rates, include precipitation, wind speed and direction, relative humidity.
3. Soil Retention:
 - Cross sections and longitudinal profiles will be measured and compared across temporal scales to estimate sedimentation.
4. Soil Moisture:
 - Soil moisture cross sections utilizing a TDR-100 Soil Moisture Meter will be mapped.
5. Flow Velocity and Channel Roughness:
 - Estimate flow velocities in arroyos using Manning's Equation.
6. Vegetation:
 - The line intercept method will be utilized to estimate % cover, densities and species composition.
7. Wildlife Use:
 - Estimate browsing/grazing levels via Stubble-Height and Line Intercept methods.
 - Camera trapping to inform species use and activity while in arroyos (e.g., grazing, drinking, bedding)
 - Terrestrial invertebrate sampling via pitfalls and sweep netting.
 - Aquatic invertebrate sampling via D-net seining.



Significance

- This study could identify the impact of restoration efforts on key variables;
- Contribute to the refinement of restoration design and implementation;
- Inform wildlife habitat use in newly created rehabilitated habitat.

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