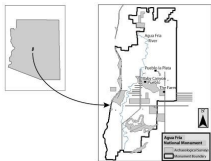


Legacies on the Landscape: Integrating Ecology and Archaeology on the Agua Fria National Monument, AZ

Karen Gust Schollmeyer, John Briggs, Kari Horn, Keith Kintigh, Melissa Kruse, Chien Lai, Hoski Schaafsma, Katherine Spielmann, and Caitlin Wichlacz, Arizona State University

Legacies on the landscape

This project is a collaborative effort between ecologists and archaeologists focused on identifying long-term legacies of prehistoric and modern human land use in the desert grassland environment of the Agua Fria National Monument, north of Phoenix, Arizona. Students and faculty from the Department of Anthropology and the School of Life Sciences at Arizona State University and researchers from the Bureau of Land Management are currently involved in a pilot study whose outcomes will shape future project activities. Archaeologists and ecologists collaborated in all aspects of the research design, data recording, and analysis.



Pueblo La Plata

Pueblo La Plata, a masonry pueblo dating to A.D. 1200-1400, was selected for the pilot study for several reasons.

- La Plata's large size (over 100 rooms) suggests a sizeable prehistoric population with the potential to have created lasting environmental changes.
- Surrounding agricultural features (rock piles, cleared areas, agave fields, and rock alignments) indicate a human-modified landscape.
- Documentation of current conditions was desirable for BLM researchers in anticipation of future development of the site for visitors.

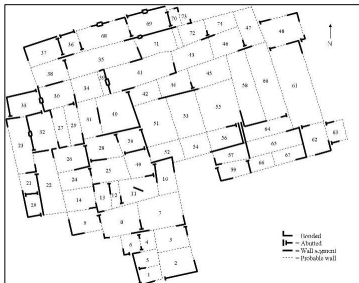


Objectives

- Investigate long-term legacies of prehistoric and modern human impact in a desert grassland environment
- Develop research methods appropriate for collection of complementary archaeological and ecological data regarding such impacts

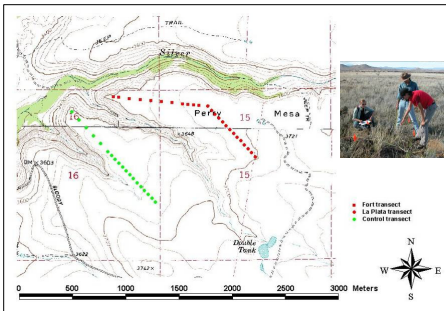
Architecture studies

- Wall corners were examined and details of visible bonding, abutting, and masonry recorded. Walls were also mapped with a total station.
- Rooms were built in a number of construction episodes. Walls of adjacent rooms are often offset (eg. rooms 41-46) and many major walls are not contiguous. Rooms were added in groups of 4 to 6 at a time.
- The pueblo grew by accretion rather than simultaneous construction, suggesting temporal changes in population and potentially in levels of human environmental impact.

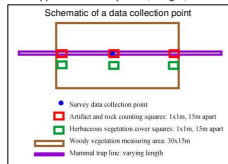


Simultaneous collection of archaeological and ecological data

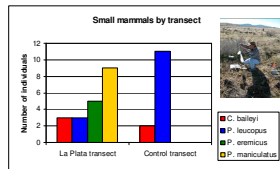
Survey along two transects near La Plata and one more distant "control" transect allowed simultaneous collection of data on the presence, numbers, and distributions of woody plants, herbaceous plants, and rodents as well as artifacts and rock cover, allowing us to link patterns in the ecological data with other indicators of human land use.



- Each data collection point included:
- A set of three 1x1m squares (arranged perpendicular to the transect line) in which artifact counts and rock cover were recorded
 - A set of three 1x1m squares in which herbaceous plant species and percent cover was recorded
 - A 30x15m square in which woody plant species and dimensions were recorded
 - A trap line (arranged perpendicular to the transect line) along which small mammals were live trapped and their species, weight, and sex recorded

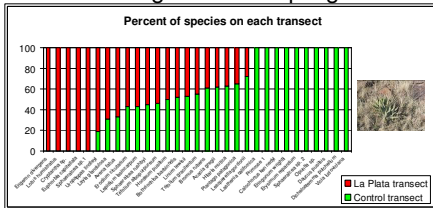


Small mammal trapping



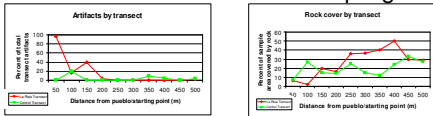
- Population density appears higher on the La Plata transect (20 individuals/160 traps, capture rate 12.5%) than the "control" transect (13 individuals/280 traps, capture rate 4.6%)
- Species diversity is higher on the La Plata transect, and includes species preferring a wide range of habitats (*Peromyscus maniculatus*).

Vegetation sampling



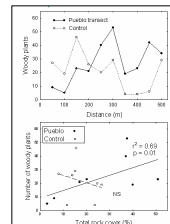
- Herbaceous species richness and dominant species are similar on both transects.
- Rare herbaceous species differ between transects, with 5 species found only on the La Plata transect and 10 found only on the "control" transect.
- No significant differences were found in percent cover or woody plant size.

Artifact and rock cover sampling



- Not surprisingly, artifacts are most common in the area closest to the pueblo, and are rare on the "control" transect.
- Rock cover is low immediately around the pueblo and shows spatial concentrations along other portions of the La Plata transect. It is less variable on the "control" transect.

Rock cover and woody vegetation



- Numbers of individual woody plants increase with distance from the pueblo.
- There is a positive relationship between number of individual woody plants and total rock cover on the La Plata transect (particularly cobble cover, not shown separately here).
- There is no significant relationship between woody plants and rock cover on the "control" transect.



Conclusions

In this sample, several patterns suggest prehistoric human activities left visible legacies on the landscape still visible today, even in an environment heavily impacted in more recent years by grazing, fire, and other processes. These patterns should be investigated with additional data and replicate study sites.

- Rock cover varies with distance from the pueblo. Rock cover is also correlated with woody plant counts on the La Plata transect.
- Herbaceous vegetation species composition differs between the La Plata and "Control" transects, as does small mammal species diversity.

This study also demonstrates exciting possibilities for interdisciplinary collaboration. The data collection methods used here allowed information of interest to both archaeologists and ecologists to be collected by members of both disciplines. These methods also allowed successful integration of multiple sources of data to examine issues of interest to researchers in both fields.

Acknowledgments

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