A Growing Picture: The "Ghost Forests" of Jack Creek Wyoming

Erin M. Parks and Marcy Reiser

Colorado State University Anthropology Department

E-mail: emparks4@simla.colostate.edu, mreiser@lamar.colostate.edu

Abstract

Integration of archaeological patterns with paleoecological data is often difficult. As part of the Greybull River Sustainable Ecology project (GRSLE) in northwestern Wyoming, we have begun documentation of a series of stumps and fallen trees, which seem to represent "ghost forests" providing evidence of Little Ice Age vegetation. Recording the lengths, diameters, and orientation of the trees and plotting them as GIS layers will assist in building a better picture of forest dynamics during the Late Prehistoric Period. Because many of these ghost forests overlay archaeological sites, understanding the relationships between past forest boundaries and prehistoric site placement is crucial. By collecting and dating charcoal from the trees, in conjunction with dendrochronological and dendroecological research, we can get an idea of the fire activity on the sites and how this activity may impact sites preservation. Environmental research of the ghost forest along the Jack Creek Drainage area contributes to regional archaeological research, promotes a dialog with the local community about long-term human/environmental interactions, and provides a database from monitoring future changes.

Introduction

As we interpret the archaeology of the Greybull River Sustainable Ecology project (GRSLE) in northwestern Wyoming, we also need to take into account the changing landscape of the surrounding area including obtaining an idea of what prehistoric landscapes might have looked like. In the Jack Creek drainage area, where much of the 2005 Field School took place, we encountered a series of patches of dead forests along the boundaries of the current forests. These dead forests were characterized mainly of rotting tree stumps and fallen tree trunks; therefore, we termed these dead forests "ghost forests" and/or "ghost trees". These ghost forests provide significant clues to landscape dynamics during the Late Prehistoric.

Acquiring a better understanding of these ghost forest by dating techniques and mapping their relation to the current forest and archaeological sites, we can start to put together an idea of when these forests died and how this prehistoric pastlandscape may have impacted prehistoric peoples land-use patterns.

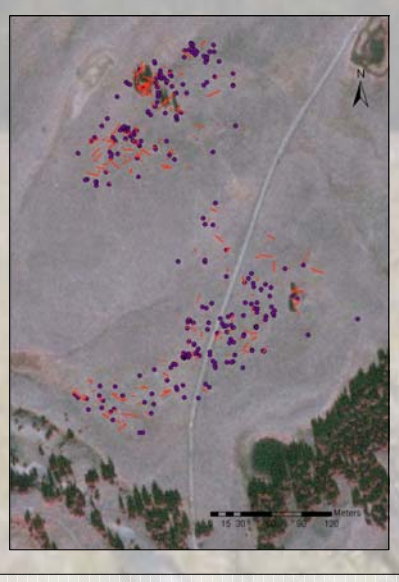

Figure 1: GIS layers recording the ghost forests in relation to the current forest boundaries.

Methods

To capture as much data collection as possible we used a variety of methods.
A non-systematic survey of the landscape was conducted to determine the location of possible ghost forests. After areas of documentation were selected, we used a Trimble GeoXT GPS unit to record their locations.
Point = tree stump
Line = downed tree
In the Trimble GeoXT GPS the diameter and height of every tree stump was recorded if applicable (some stumps were rotted to where we were not able to get a diameter), and diameter and length of every downed tree was also recorded (only measured length of complete tree, did not record the shadow, or debris left by deteriorating tree trunks). We also noted if any trees had potential collectable charcoal samples.
A cross section of a ghost tree was also taken for dendrochronological dating as well.

Figure 3: Cross section taken from tree for dendrochronology dating

Figure 4: Picture of charcoal taken from one of the ghost trees for radiocarbon dating

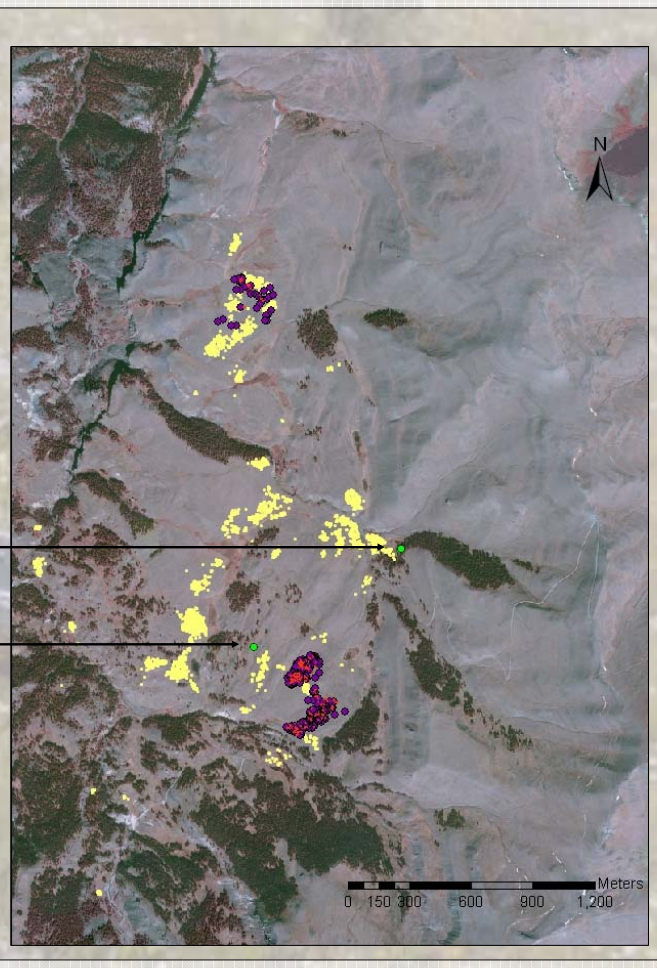

Figure 2: Map of ghost forest in ArcPad with details of where the dendrochronology sample was taken, where the charcoal sample was taken, and where documented sites are. Note: The ghost forests plotted on these maps are not the extent of the ghost forests in the area.

Results

- From the charcoal sample taken from one of the ghost trees, we were able to determine that the time of burn was a conventional age of 330+/-50 BP. A two-sigma calibration result with 95% probability, determined the trees were growing from AD 1450 to 1660.
- Results from the tree ring sample taken from the ghost forest indicate it lived for 250 years before its death, dying no latter then the early 1700's and sprouting several hundred years earlier.
- When looking at the GIS layers of the ghost trees and artifacts together we can see that in general there are few artifacts where ghost trees lie.
- Since we are able to see two different time periods of tree stands, today and the 1700's, we can conclude that contemporary tree stand locations are not a constant on the landscape.
- Currently the tree stands and the sites are separate. According to the radiocarbon and dendrochronology dates of the charcoal, the ghost trees died in the 1700's, therefore the tree stands in the 1700's were separate as well.
- Forest erosion affects the taphonomic zone that the artifacts emerge in, therefore limiting site erosion around this area of ghost trees (Teeter et al).

Conclusions

After evaluating the results of the research conducted in the Greybull River Drainage area of the ghost forests, we have recognized the significance of including the study of non-archaeological landscape features into our project. When corresponding the radiocarbon date with the tree ring date we can see that the ghost trees generally sprouted in the mid-1400's and died in the late-1600's or early-1700's. Because we are able to see two different tree stands, we can conclude that current tree stands do not give us the appropriate environmental picture in which to evaluate site placement. Therefore, looking at the sites of the surrounding area in relation to the ghost trees might give us a better idea of what the paleoenvironment looked like at the time these sites were created. Sites might be more intact in areas of the ghost forest since forest erosion affects the taphonomic zone and the taphonomic zone is less active in forest areas (Teeter et al). Studying these ghost forests is the beginning of a deeper understanding of the area in relation to archaeological research from an ecological perspective.

Future Research

More research is needed to gain a clearer view of what these ghost trees can tell us about the paleolandscape and how the sites relate to the forest. In the future, we may want to look at the forest in correlation to water sources to see if these forests are being eroded by water in any way. We may also want to get core samples from a variety of other ghost trees in the area as well as cores from recently deceased trees to see if there is an overlap in time periods. A more extensive data record of the entire ghost forest area should be taken for monitoring recreational impacts as well as determining other tree to site relationships. Information of the ghost forest and its importance should be conveyed to the local community to prevent destruction or collection of the ghost tree forest. Clearly, we have only begun the research necessary to make the ghost forest an integral part of the archaeological record in the Greybull River Drainage.

References:
Teeter, Sean, Zach Koski and Chrissian Burke
2005 Poster
63rd Plains Anthropological Conference

Printed By
integra engineering

63rd Plains Anthropological Conference October 19 – 21, 2005 Edmonton, Canada