



Project Title: *Henry Smith UAS Aerial Inventory*

Background:

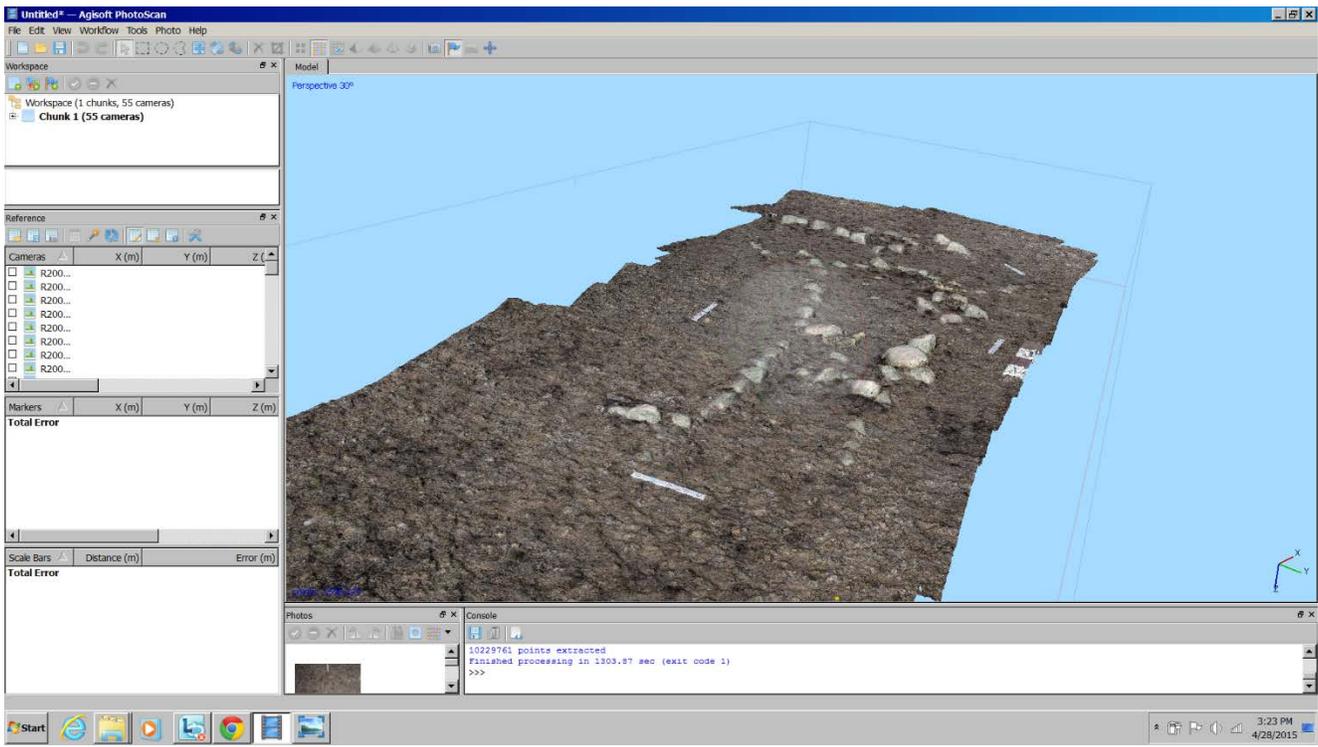
The Henry Smith site is located in the Big Bend of the Milk Cultural Area of Critical Environmental Concern (ACEC) which encompasses close to 2000 acres in North Central Montana. The location is dominated by the presence of a buffalo kill location, prehistoric drive lines, ground figure (both anthropomorphic and zoomorphic), habitation sites and medicine wheels. Prior to the UAS project, an all-encompassing map of these locations did not exist due to extreme difficulties in mapping these large scale and complex locations from the ground. Aerial inventory and recordation allowed for better management and protection of these unique national Register of Historic Places (NRHP) eligible property.

Project Objectives:

- Established accurate map of Henry Smith site. Total UAS flight time was less than 20 hrs. Traditional Archaeological methods would have taken approximately 90-120 days or 720-960 hrs. per crew member to record the features and would not have provided the quality of data.
- Provided a proof-of-concept and effectiveness study for future use of UAS for accurate Cultural Resource inventories in relation to large-scale prehistoric cultural complexes.
- Created accurate ground based close range photogrammetry of all locations within the ACEC
- Achieved long range management objective from Resource Management Plan (RMP)

Justification and Advantages of UAS methods in relation to cultural resources:

- Traditional Class III cultural resource inventory was inadequate to record all aspects of large scale cultural properties, especially when vegetation and topographic constraints are present. Use of UAS improved the accuracy and enabled detailed inventory and mapping which was accomplished much faster and at a significantly reduced cost.
- As an alternative, use of personnel in helicopters in a prolonged low level hovering flight profile to map cultural resource locations would produce results but only allows for a one time recordation of sites as identified by personnel during the flight. Helicopters have been used in the past but are not the most cost effective avenue due to the excessive cost and risk.
- UAS provides for a highly detailed and accurate noninvasive mapping technique
- Extreme Cost savings , UAS total with processing \$15,000 +/-, traditional methods for crew time alone would be upwards of \$25,600- 33,600 per individual or \$100,000 plus (4, GS-05 Archaeological Technician)



Screen Shot of Data acquired on Human Effigy located at Henry Smith site