



The Northern Chaco Outliers Project 2017 Field Report

Author names and affiliations: Susan C. Ryan and Rebecca L. Simon, Crow Canyon Archaeological Center

Period covered by this report: 2017 Field Season

Picture of project that depicts volunteers: Above, Earthwatch Institute Volunteers wash pottery in the laboratory.

LETTER TO VOLUNTEERS

Dear Citizen Scientists,

With your support we have initiated the Northern Chaco Outliers Project that involves the archaeological investigation of ancestral Pueblo public and residential architecture within a 5-acre property owned by the Haynie Ranch, LLC. This project focuses on the Haynie site, a multi-component ancestral Pueblo village with two Pueblo II period (A.D. 950-1150) great houses (also known as Chaco outliers). The great and small houses at the Haynie site were part of the larger Lakeview community, a 1-km² area comprised of one of the densest concentrations of great houses found in the northern San Juan region.

Data collected during the Northern Chaco Outliers Project will enable inquiry into issues of broader anthropological interest including whether migrants from Chaco Canyon or the middle San Juan region built the Lakeview community, the nature of social stratification and social equality/inequality, the role of public architecture within aggregated communities, the development of social complexity, the role of community centers through time, the sustainability of natural and cultural resources, and the changing relationship between humans and the environment during the A.D. 1130-1180 drought. With your help in the laboratory and in the field, we have begun to address these important topics!

We carefully selected archaeological contexts that would generate data needed to answer our research questions and to address the overarching anthropological issues mentioned above. Data will be generated for the next several years leading up to our on-line interpretive report and companion database publications on Crow Canyon's website providing free access to people across the world (www.crowcanyon.org).

I can say with great confidence that this research project will make substantial contributions not only on our knowledge of the culture history of the prehispanic Southwest, but to issues that you, our citizen scientists, find of increasing importance including human-environment relationships, sustainability, climate change, human migrations, agricultural productivity, and ever-changing social structure in societies across the globe. In archaeology, we are fortunate to work in a science that studies data over extended periods of time, a luxury that other disciplines don't have. We have a rare opportunity to not only tell the stories of our human past, but to predict how natural and cultural events will shape our future. If we can advise people on how to create better policies and make informed decisions in the present and future, we will have made a huge impact on the world for generations to come. I cannot stress enough the importance of this project!

The Northern Chaco Outliers Project would not be possible without the help of citizen scientists, like you, who assist our field and lab archaeologists in the collection, processing, and interpretation of data. I want to thank all the individuals who have supported our mission during the 2017 field season and to welcome those who would like to become involved in this important research in 2018. I look forward to working with you!

Sincerely,
Susan Ryan, Ph.D.

SUMMARY

This report summarizes progress on the northern chaco outliers Project during the 2017 field season, which was conducted from March through October under the State of Colorado Archaeological Permit No. 2017-5. The 2017 field season was funded, in part, by a History Colorado State Historical Fund grant (#2016-02-035) and an Earthwatch Institute grant.

GOALS, OBJECTIVES, AND RESULTS

The Northern Chaco Outliers Project Annual Report, 2017 Field Season

*Rebecca L. Simon, Susan C. Ryan, Shanna R. Diederichs, Kari L. Schleher,
Caitlin A. Sommer, Steven R. Copeland, and Grant D. Coffey*



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Introduction

The Crow Canyon Archaeological Center (Crow Canyon) began the Northern Chaco Outliers Project (NCOP) in the summer of 2016. This project seeks to understand human and environment interaction, social stratification, community centers with public architecture, and identity formation during the Chaco and post-Chaco periods in the northern San Juan region. The NCOP uses data from three sites—the Haynie site (5MT1905), the Ida Jean site (5MT4126), and Wallace Ruin (5MT6970)—located within a 1-km radius that include four Chaco-style great houses and one great kiva. These sites compose the Lakeview group, which is one of the densest concentrations of great houses north of Aztec Ruins in northern New Mexico. Other great-house clusters in the northern San Juan region include the Ackmen/Lowry community and the Mitchell Springs community. The Haynie site, which is the primary focus of the NCOP, experienced extensive disturbance for more than 30 years in the recent past. Previous landowners engaged in nonprofessional digging, which compromised the archaeological record at the site, but research potential remains robust (Ryan 2016a).

NCOP research began in 2016, when Crow Canyon conducted in-field artifact analyses and contracted the production of drone maps, aerial imagery, and photogrammetry of the immediate area surrounding the Haynie site. In 2017, Crow Canyon conducted field research in the form of testing, excavation, architectural documentation, and stabilization at the Haynie site. Remote sensing consisted of electrical resistance survey and gradiometry survey. Artifact analyses for the Haynie site and the Ida Jean site are underway. Initial fieldwork and analyses have produced substantial data and insight regarding the development of these settlements including occupations that pre- and post-date the Chaco period in the central Mesa Verde and the wider northern San Juan regions (Figure 1). Also in 2017, as a result of Crow Canyon's efforts, the Haynie site was placed on the National Record of Historic Places.

This report summarizes progress on the NCOP during Crow Canyon's 2017 field season, which was conducted from March through October. This research was funded in part by a History Colorado State Historical Fund grant (No. 2016-02-035) and a grant from the Earthwatch Institute. Fieldwork and associated Crow Canyon education programs were conducted by members of Crow Canyon's archaeology and education staffs with the assistance of interns. Field and laboratory studies conducted by contractors are also summarized in this report. Upon completion of all fieldwork, laboratory analyses, and synthetic studies related to the NCOP, Crow Canyon will publish detailed results of this research on its web site (www.crowcanyon.org).

Project Background

In the 1980s and 1990s, Ralph and Claudia Haynie (previous landowners and namesakes of the site) dug extensively at the Haynie site (Figure 2) to recover complete vessels and other artifacts. During this activity, rooms and kivas were excavated, and large portions of two Chaco-style great houses at the site were damaged. Claudia Haynie kept a journal noting their digging activities and the types of artifacts that were recovered from specific locations on the site. She also kept records detailing the contexts of specific artifacts. From 2008 to 2014, archaeologist Joel Brisbin engaged in excavation and stabilization work on structures in both of the great houses and in extramural areas between the great houses (Ryan 2016a).

Modern-day research projects conducted at the site have been limited in scope, but include a basic temporal assessment centered on diagnostic artifacts on the modern ground surface. This research was conducted as part of the Village Ecodynamics Community Center Survey, which was funded by the National Science Foundation (Glowacki and Ortman 2012; Kohler and Varien 2012). Also, a digital mapping project of the site was conducted as was documentation of exposed architecture in the east and west great houses (Ryan 2013, Appendix I).

In 2016, Crow Canyon contracted University of North Texas and Paleowest to create drone maps, aerial images, and photogrammetric models of the immediate area surrounding the Haynie site and Wallace Ruin, and Ben Hammer of Paleowest made three-dimensional models of the remains of the two Chaco-style great houses at the Haynie site. Crow Canyon also conducted in-field artifact analysis and collected artifacts using a dog-leash method for laboratory analysis. In-field analysis was also performed on two previously created collection piles at the site; more than 27,700 artifacts were recorded and analyzed from collection piles (Ryan 2016b). The data from these analyses guided fieldwork in 2017 and led to the inference that the two great houses, which were constructed and occupied during late Pueblo II times, were built atop cultural deposits dating from the Basketmaker III (A.D. 550-

750) and Pueblo I (A.D. 750-900) periods. Moreover, data suggest that both great houses continued to be occupied during the post-Chaco period (A.D. 1150-1300).

In 2017, interviews with Claudia Haynie and Joel Brisbin, and a review of their journals, notes, and maps, informed Crow Canyon archaeologists of the extent of previous work at the Haynie site and of the historical sequence of previous work in the two great houses at the site. These resources also indicated the potential for intact deposits and evidence of earlier occupations throughout the site.

Project Area Location and Ownership

The Lakeview group is located in Montezuma County, Colorado, east-northeast of the modern-day town of Cortez (Figure 1). The sites in this group are in the heart of the Mesa Verde archaeological region, north of the Mesa Verde escarpment and near the confluence of Simon Draw and McElmo Creek; Stinking Springs is located southeast of the Lakeview group. The majority of the Haynie site is located on a 5-acre property currently owned by the Haynie Ranch, LLC. The easternmost portion of the Haynie site is on private land not accessible to Crow Canyon. Wallace Ruin, located 335 m south of the Haynie site, is owned by Bruce Bradley. Data from Bradley's publications on Wallace Ruin (Bradley 1988, 1992, 1993) will be used for comparative purposes for the NCOP. The Ida Jean site (5MT4126), located 859 m west of the Haynie site, is also on private land not accessible to Crow Canyon. Although much of the Ida Jean site has been destroyed, some information on the site is available from work done in the 1970s (Brisbin and Brisbin 1973). Notes, maps, and artifact data resulting from previous digging at the Haynie site are being integrated into Crow Canyon's research database to augment data collected by the NCOP for the Lakeview group.

Permits and Permissions

During the 2017 field season, excavation, testing, and survey at the Haynie site were conducted under State of Colorado archaeological permit 2017-5 and with the permission of the Haynie Ranch, LLC. Data collection from documents associated with, and artifacts collected from, the Ida Jean site was conducted by means of a loan agreement with the Anasazi Heritage Center in Dolores, Colorado, which is managed by the Bureau of Land Management. Materials from the Ida Jean site are currently curated in that facility.

Environmental Setting

The NCOP study area includes an environment defined by the surrounding drainages and by current agricultural use of the land. Figure 3, an aerial image captured in the 1990s, shows the locations of sites in the Lakeview group as well as of nearby sites. The Haynie site is located at 6270 ft (1911 m) and is situated on a small knoll to the north of, and just above, a shallow broad valley within Simon Draw. The head of Simon Draw is located about 6 km north of the Haynie site. Simon Draw empties into McElmo Creek 4 km southwest of the Haynie site.

The soils of the valley bottom south of the Haynie and Ida Jean sites, and upon which Wallace Ruin sits, are predominantly Gladel-Pulpit complex (an eolian loess), and Ramper clay loam (a well-drained eolian loess). These soils are among those with the greatest agricultural potential in the entire region (Van West 1994:162-167). Today the valley bottom is plowed and irrigated and produces primarily alfalfa/grass hay. Small undisturbed areas are present in the valley, and these are covered in sagebrush, lesser amounts of greasewood and saltbush, and some riparian vegetation that includes cottonwood, willow, cattails, and sedges. The Chaco-style great houses and the midden deposits at the Haynie site are covered mostly with sagebrush, saltbush, and grasses. Sandstone ridges flank and rise above the valley floor, and these ridges support pinyon-juniper woodland.

Public Involvement

Crow Canyon's mission includes a commitment to public education and outreach. Our 2017 program season included approximately 1,800 participants in school programs, research programs, and professional development programs. Participants ranging from middle-school students to life-long learners assisted with field and laboratory work. Specifically, 150 school children participated in excavations at the Haynie site. Additionally, 24 educators from across the U.S. participated in a Summer Institute funded by the National Endowment for the Humanities and entitled *From Mesa Verde to Santa Fe: Pueblo Identity in the Southwest*. The Institute included one-half day of fieldwork at the Haynie site and an introduction to laboratory work. Crow Canyon's teen summer camps involved

80 students, all of whom excavated at the Haynie site: 21 students in Middle School Archaeology Camp, 42 students in High School Archaeology Camp, and 17 students in our three-week High School Field School. This past year witnessed Crow Canyon's third college-level field school, which was attended by 12 students. Also in 2017, Crow Canyon developed additional college-level curricula through which 63 college students and educators experienced Crow Canyon's research and programs. At least 100 individuals visited the Haynie site as part of one-day tours, drop-in tours, Cultural Explorations tours, and other programs. Data collection was greatly facilitated by the 80 adult participants in our research programs and 35 volunteers engaged through a partnership with Earthwatch Institute. Earthwatch volunteer programs included two teen groups that excavated at the Haynie site. Finally, laboratory work on NCOP materials was facilitated by approximately 10 long-term adult volunteers who assist with processing, analyses, and curation of archaeological materials.

The number of lay people served in 2017 reflects not only Crow Canyon's commitment to involving the public in its research but also the level of public interest in the ancient past of the Mesa Verde region. In addition to participants enrolling in Crow Canyon's programs, evidence of public interest in the NCOP includes articles in professional newsletters and mainstream publications such as the *New York Times* (2 September 2017), which featured the Haynie site in an article titled, "Ruined 'Apartments' May Hold Clues to Native American History."

American Indian Involvement

As a way to inform Crow Canyon's research and enrich the experience of participants enrolled in Crow Canyon's education programs, our research and programs support and encourage American Indian involvement in a variety of ways. During the 2017 season, many American Indian scholars, students, and participants were involved in our programs, and numerous opportunities were supported by scholarships. The Pueblo of Isleta brought 12 American Indian participants to excavate at the site. Santa Ana Pueblo brought eight teachers to the site as part of a professional development day tour. Scholarship funds totaling \$14,700 were disbursed to American Indian students to attend our High School Archaeology Camp (1), High School Field School (1), and College Field School (2).

During the 2017 season, Crow Canyon involved American Indian scholars in research, educational programs, and educational tours. Three scholars—Deloria Lomawaima (Hopi), Justin Lund (Navajo), and Jonathan Byrn—tracked and provided insight to students during College Field School. Ed Shije (Pueblo of Zia) was a scholar-in-residence during High School Archaeology Camp. Lyle Balenquah (Hopi) and Anthony Lovato (Santo Domingo Pueblo) came to the Haynie site as a part of Cultural Exploration programs.

Crow Canyon's Native American Advisory Group also contributed to the NCOP. The Group met five times in 2017, including one meeting at the Haynie site, and Crow Canyon's Director of American Indian Initiatives Sharon Milholland consulted with particular members of the group on issues such as culturally sensitive objects. Supervisory Archaeologist Caitlin Sommer provided an oral field report to the Group at Crow Canyon's Board of Trustees meeting in October 2017; the handling of human remains and disturbed cultural materials were topics of the associated discussion.

2017 Fieldwork

All NCOP fieldwork—excavation, survey, and other documentation—during the 2017 field season was conducted at the Haynie site (5MT1905). Table 1 lists the 36 excavation units opened in 2017 and specifies the five units that have been completed. At the end of the field season, the 31 excavation units still in progress were covered with plywood and sealed with plastic sheeting to protect the units from damage during the winter. These units will be completed during the 2018 field season.

In 2017, subsurface testing and excavations occurred in three areas of the Haynie site: directly south of and adjacent to the remains of the west great house, in a northwest portion of the site where a wall was exposed during previous mechanical disturbance, and in the area that forms the lawn associated with the modern house. Figure 4 shows the locations of all excavation units set in during the 2017 field season.

Excavations

Structure 186

Located west of the modern house, Structure 186 (Figure 5 and Figure 6) is a room featuring single-coursed masonry. A wall segment, which was identified in a 2-x-2-m unit and a 1-x-1-m unit, had been constructed using irregularly shaped sandstone rocks and mortar. The installation of a modern laundry-drainage pipe had damaged the wall and disturbed the fill in the room. Structure 186 appears to be a detached room constructed within, and possibly using the remains of, an earlier structure (Structure 193). The floor is unplastered construction fill. We infer that the remainder of the room is damaged and that the damage was caused by the roots of a nearby apple tree and by additional activities related to modern occupation. Excavations will continue in this structure in 2018.

Nonstructures 187, 189, 190, and 191

Information provided by Ralph and Claudia Haynie and Joel Brisbin suggested the presence of a Pueblo I pithouse below a large kiva in the western portion of the west great house. However, our electrical resistance survey data did not produce clear enough images to confirm the existence of a pithouse in this location. To test for this possible pithouse, four 4-x-2-m units were placed between the remains of the west great house and the fenced yard. Excavations revealed that the deposits in the two southernmost trenches were heavily disturbed. The modern ground surface consisted of sediment atop plastic netting that was probably associated with the placement of sod after a portion of the great house had been removed. The sediment below the netting contained a moderate quantity of artifacts including flaked-lithic debitage, pottery sherds, ground-stone artifacts, and modern trash. In the southernmost unit, a pipe associated with the modern house was identified. The depth of the pipe revealed that deposits had been disturbed to a depth sufficient to impact any structures that might have been present. As a result, excavation was discontinued in those units, and the northernmost units were not excavated.

To search for footer trenches associated with the west great house, two units—a 1-x-2-m unit and a 2-x-2-m unit—were placed where the westernmost wall of the west great house appears to have stood originally. However, no evidence of footer trenches was detected; thus, such features might never have existed, or they might have been destroyed by the modern activity described above. Despite being disturbed, these units provided data on earlier components at the site. Both units contained surfaces into which features were dug, and these surfaces probably predate the west great house.

Nonstructure 187 is a surface identified in a 2-x-2-m unit. This surface had been created in a deposit of construction material that was impacted by mechanical disturbance and by the installation of a modern irrigation system in the western portion of the unit. A pit feature, Feature 1 (Figure 7), had been dug into this surface. The top of the feature had also been disturbed by mechanical activity in the west great house and by the creation of the modern lawn (Figure 8). The few artifacts collected from Feature 1 included sherds, flaked-lithic debitage, and nonhuman bone.

Nonstructure 189 is a layer of construction fill beneath Nonstructure 187; this deposit contained a low-to-moderate density of sherds and flaked-lithic debitage. Below Nonstructure 189 is Nonstructure 190, which consists of midden deposits with sherds, flaked-lithic debitage, ground-stone artifacts, calcite minerals, nonhuman bone, projectile points, and burned corn cobs. Excavation will continue in 2018.

Nonstructure 191 is a surface identified in a 1-x-2-m unit (Figure 9) and consists of compacted native sediment beneath the west great house. As evidenced by backhoe scars, the surface and the sediment above this surface had been disturbed by previous digging in the great house. Despite the disturbance, small portions of two pits, Features 1 and 2 (Figure 10), which had been dug into undisturbed native sediment, were defined. Feature 1 is a shallow pit with a small depression. Feature 2 had been dug into Feature 1.

Nonstructure 192

In the northwest portion of the site, we laid three grids of electrical resistance survey over the remains of the west great house and over a short section of exposed wall west of the great house (see Geophysical Survey section and Charles 2017). In the westernmost survey grid, two anomalies were identified just south of a rubble mound. The rubble appears to be a mix of wall fall from roomblocks and of disturbed sediments. The location of the anomalies in proximity to the rubble mound and at a slightly lower elevation suggests that the anomalies indicate subterranean structures.

Two trenches—one consisting of a 3-x-1-m and a 4-x-1-m unit and the other consisting of two 3-x-1-m units—were placed to investigate these anomalies. In the uppermost 35- 40 cm, artifact density was moderate, and the

deposits appeared to have been disturbed by recent mechanical activity. Below that depth were disturbed midden deposits, and artifact density, size, and diversity greatly increased. Both trenches contained very large sherds (mostly corrugated and black-on-white), flaked-lithic debitage, ground-stone tools, and burned corn cobs. In the northern 4-x-1-m unit of the western trench, three aligned stones were exposed approximately 80 cm below the modern ground surface. Auger tests in the southern portion of the unit indicated that what appears to be construction material continues downward for at least an additional 1.5 m. In the southernmost end of the southern 3-x-1-m unit of the eastern trench, decomposing bedrock and a stratum of calcium carbonate was identified at approximately 80 cm below the modern ground surface. Fill continues in the remainder of the trench. Excavations will resume in both trenches in the 2018 field season.

Structure 193

Structure 193 is a room constructed of single-coursed masonry located directly west of the modern house. The northern wall of the room was identified in two 1-x-1-m units—one was randomly selected to investigate the deposits west of the modern house, and one was selected to investigate the northern wall (Figure 5 and Figure 6). The wall consists of rectangular sandstone blocks and mortar, and the wall arcs to the southeast (Figure 11). The trajectory of the wall suggests that the interior is approximately two meters wide (east-west); the exact measurement will be revealed by excavations to the south and west in 2018. The floor was not prepared. Structure 193 experienced disturbance in both ancestral-Pueblo and modern times: Structure 186 had been constructed within Structure 193, and a laundry-drainage pipe was recently installed roughly east-west through the center of the room. The southwest portion of the room will be excavated in 2018.

Beneath the upper portion of the north wall (Figure 12) is a layer of construction fill. Under this fill is an alignment of sandstone rocks. These stones appear to create an arc to the northeast rather than follow the trajectory of the upper wall. Excavations in 2018 will seek to determine if these stones represent footer construction associated with the upper portion of the wall or a different construction that predates both Structures 186 and 193.

Nonstructure 196

Small portions of approximately three rooms in the northwest corner of the west great house stand directly north of the modern house and fenced yard. The walls of these rooms are backed by large rubble mounds. To identify the northwesternmost corner of this great house, we excavated two 2-x-4-m units adjacent to the westernmost wall of the great house. Nonstructure 196 consists of midden deposits beneath wall-fall debris associated with the west great house. The midden contained a moderate to high artifact density and yielded sherds, flaked-lithic debitage, and ground-stone tools. Excavations will continue in 2018.

Structures 197 and 198

In the northwestern portion of the site, due west of the remains of the west great house, two short masonry walls made of irregularly shaped and globular sandstone rocks had been exposed by previous digging. Notes and masonry-typology records created between 2008 and 2014 document the exposure of these walls. Interviews and pre-program assessment of the area southwest of the walls indicate that the fill of the associated structure had been heavily disturbed and the floor removed. Northeast of the walls, the interiors of two rooms in a roomblock constructed of single-coursed masonry were identified in two irregular units (Segments 1 and 2). Structure 197 is the west room; north, east, and west walls of this room were identified. This structure is approximately 2 m wide (northwest-southeast). Structure 198 is the east room; north and west walls were identified. Excavations are ongoing, and in the 2018 field season we will investigate whether the walls exposed by previous digging connect to the walls we identified for Structures 197 and 198.

Other Fieldwork

Architectural Documentation and Stabilization

To better understand the development of the Lakeview group during the Chaco (A.D. 1080- 1140) and post-Chaco (A.D. 1140-1225) periods, we will examine, document, and compare architectural data from all sites in the group as part of the NCOP. According to previous work at the Ida Jean site (Figure 13) and Wallace Ruin (Bradley 1988:Figure 1), these two great houses were built in compact, McElmo-style blocks with two aboveground kivas enclosed by several rooms, whereas the great houses at Haynie appear to be much larger in scale (Figures 14 and 15). All four of these great houses exhibit core-and-veneer masonry and other Chaco construction traits, including radial-beam pilasters, subfloor ventilation systems, aboveground blocked-in kivas, lofty ceilings, multiple stories, and T-shaped doorways (Bradley 1988, 1992, 1993; Brisbin and Brisbin 1973).

Previous digging and rubble clearing at the Haynie site exposed masonry walls in both the east and west great houses. In the west great house, walls associated with the first and possibly the second story of four rooms are exposed above the modern ground surface. In the east great house, the interiors of four kivas, 14 rooms, and portions of the exterior great-house wall are exposed. These once-buried walls have been subjected to the elements for at least 30 years and are in various states of deterioration. Crow Canyon archaeologists are documenting, and in some cases stabilizing, the exposed walls at the Haynie site for two reasons: (1) the exposed walls retain information about the construction, use, and builders of each great house; and (2) some exposed walls present a safety hazard to both staff and our program participants. The Crow Canyon documentation process comprises six phases: photography, condition assessment, architectural-detail documentation, veneer sampling, mortar analysis, and identification of previous stabilization events. Documentation occurs on both paper forms and as annotations on prints of wall-elevation photographs.

In 2017, a few walls were minimally stabilized to mitigate immediate safety threats. All standing walls in the west great house were documented, and two walls were stabilized. In the east great house, architectural documentation has begun in three of the 14 exposed rooms. In addition, a short demonstration wall was constructed for educational purposes north of an auto-body shop near the modern house. Crow Canyon archaeologists Shanna Diederichs and Kate Hughes supervised Crow Canyon adult participants in all documentation and stabilization activities.

Architectural Photographic Documentation

As both a record of current exposed masonry and as a platform for further documentation, each analyzed wall was photographed. These wall-elevation photographs include a scale and were taken at a distance sufficient to encompass each wall from the top extant course to the bottommost exposed course and both wall ends. In kivas, a photo was taken facing each of the four cardinal directions; each image captured one quarter of the structure masonry.

Previous Stabilization

Approximately one-half of the exposed architecture at the Haynie site had been previously stabilized to some extent. Between 2008 and 2015, Joel Brisbin stabilized sections of both ruins with the permission of landowner Ralph Haynie. During the 2017 field season, Crow Canyon archaeologists interviewed Mr. Brisbin about his stabilization work at the Haynie site, and both the materials used and the details of this stabilization work were documented. In summary, walls in the east great house were stabilized far more extensively than those in the west great house, and the focus was on areas of greatest structural instability. Support was added in the form of retaining or abutment walls, and the tops of most walls were capped. The stabilization mortars used are identifiable because of two factors: (1) reddish-brown Mesa Verde loess from other locations in the county was used, or (2) reconstituted eroded mortar from adjacent structures that was amended with small amounts of Portland cement was used. The mortar created from Mesa Verde loess is discernable as reddish-brown silt with few inclusions. The reconstituted and amended mortar is identifiable as compact, light greyish tan or pinkish tan silt with high sand content.

Crow Canyon field crews attempted to record the locations of all previous stabilization. Because stabilization activities can compromise the archaeological integrity of a wall, we did not record architectural details for stabilized areas.

Condition Assessment

Crow Canyon's architectural condition assessment is derived from the Intermountain Region National Park Service Level 2 Condition Assessment procedure (Nordby et al. 2008, Vance 2015). This type of documentation has three foci: (1) discerning the historic integrity of the architecture, (2) documenting threats to the wall fabric, and (3) documenting structurally destabilizing issues. Historic integrity refers to how much of the structure is standing and how much of the standing material is original and not reconstructed during stabilization. Wall-fabric threats encompass the most common agents of deterioration including water, weather, gravity, pests, and people. Structural-integrity issues are signs that portions of a structure have the potential to collapse. These signs include holes, voids, cracks, leans, and bulges. Together, these issues create a profile of the state of deterioration of a structure (Figure 16). Condition assessment also identifies and prioritizes areas needing stabilization.

Architectural Documentation

Basic measurements and construction details are recorded during the architectural documentation phase. All information is recorded on Crow Canyon masonry forms and annotated on printed wall-elevation photographs (Figure 17). Commonly recorded attributes include measurements, types of construction and wall abutments, construction materials, number of exposed courses, and chinking styles. Measurements include height, length, and width of the wall and the number of courses visible. Wall-abutment patterns are recorded to determine the relative construction sequence of walls within a room and the construction sequence of a room in relation to adjacent structures. Architectural features (entryways, vents, beam sockets, ledges, etc.) are recorded with sketches and detailed descriptions.

Veneer Sampling

To compare masonry-veneer styles observed at the Haynie site to veneer styles that have been documented at other ancestral Pueblo sites, Crow Canyon is collecting detailed measurements from each wall face. This is being done in accordance with the Intermountain Region National Park Service Architectural Documentation Sheet 3-Veneer Transects form (Nordby et al. 2008). Veneer sampling entails measuring the length of stones and of mortar gaps along each masonry course in a 1-x-1-m section of veneer (Figure 18). Crow Canyon will compare these data to veneer statistics of the National Park Service across the Southwest for locations such as Chaco Culture National Historic Park, Aztec Ruins National Monument, Mesa Verde National Park, Navajo National Monument, and Wupatki National Monument.

Mortar Analysis

The analysis of masonry mortar is another category of architectural study. Variations in mortar constitute evidence of differences in source material, masonry style, and phase of construction and/or of remodeling events. Using the Stratigraphic Description Form in our field manual (Crow Canyon Archaeological Center 2001), field crews are documenting all unique mortars found in each wall. This form is being used for mortar analysis because it captures the color, texture, and inclusions in earthen material, which will facilitate the comparison of mortars across the site and the identification of mortar sources on the landscape.

Stabilization

Crow Canyon archaeologists stabilized exposed masonry walls that posed a threat to visitor and staff safety. Two walls (Figure 19 and Figure 20) in the west great house were stabilized in 2017 after their condition, construction, and mortars were documented in detail.

The north wall of Room 163 in the west great house is the tallest exposed masonry wall at the Haynie site. It stands 2.5 m tall, is 4.73 m long, and towers over the central rear section of the west great house, which is an area of particular interest in NCOP research. A second veneer had been added to the exterior (north) face of the wall, which makes the wall extremely robust, but leaves the top of the wall susceptible to erosion. Our condition assessment found six small to medium voids in the upper courses of the interior face and at least seven loose stones along the current cap.

The east wall of Room 163 in the west great house is suffering from mortar loss and veneer peel. Water draining off of rubble north of Room 163 has channeled down the east wall cap causing mortar to erode from the uppermost

six courses. This caused the east and west veneers of this wall to separate from each other, which created a widened wall top riddled with erosional channels and resulted in a complete loss of the original mortar from the upper courses.

In 2017, the north and east walls of Room 163 were partly capped to increase the stability of the walls. In the north wall (Figure 20), three large stones were reset, six voids were filled, two courses of stone were added to the top of the veneer, and a small section of veneer was repointed. In total, 31 stones and 12 gallons of mortar were used to stabilize the wall cap. The east wall was entirely recapped to halt the erosion of mortar from the core. Twenty stones were reset and 14 new stones were added to seal the cap. A total of 6 gallons of mortar were used to repair the cap of the east wall. The stabilization mortar consisted of 50 percent reconstituted mortar collected from “melted” mortar in the top of the wall, 45 percent light brown silt from alluvial deposits along the south boundary of the Haynie property, and 5 percent Portland cement.

Geophysical Survey

Provided in this section is a summary of two geophysical surveys conducted at the Haynie site during the 2017 field season. A more-detailed report is also available (Charles 2017). The goal of conducting this work at the Haynie site was to identify potential intact cultural deposits and buried features including rooms and possible pit structures that could be targeted for test excavations. Artifact data from the modern ground surface and conversations with various individuals who had worked at the site suggested the presence of evidence of occupations potentially dating from the Basketmaker III (A.D. 500-750) and Pueblo I (A.D.750-900) periods. Remote-sensing data could reflect such buried deposits.

The geophysical survey for the 2017 fieldwork was conducted with two Geoscan products: a RM15 Electrical Resistance Meter and a FM36 Fluxgate Gradiometer. Grids for the electric resistance survey were aligned to true north, whereas grids for the fluxgate gradiometer were aligned to magnetic north. At the Haynie site, the magnetic north is about 11 degrees east of true north. Each grid in both surveys measured 20-x-20 m. Five grids were surveyed with the electrical resistance meter, and one grid was surveyed with the gradiometer (Figure 21). Weather and soil conditions changed throughout the collection period but were not unusually wet or dry at the time of the surveys.

Review and processing of all data were completed by Mona C. Charles, of Powderhorn Research, LLC. Charles (2017) identifies three major issues with the collection and interpretation of these data: (1) the prominence of alterations to the landscape by previous digging activities; (2) the amount of rubble from prehistoric occupations; and (3) the modern occupation of the site. These obstacles negatively impacted the dataset in terms of the number of grids and of large portions of grids that were “dummy logged.” Dummy logging consists of lines of data filled with arbitrary or no value because actual data could not be collected as a result of natural or cultural obstacles such as vegetation or exposed structures. Activities such as plowing and digging had removed much of the A horizon and had changed the electrical resistance and magnetic properties of the sediments. These activities also resulted in large trenches, depressions, and vegetation that put additional burden on the resistance meter. Abundant rubble from fallen walls, as well as potential subsurface masonry walls, especially hindered the resistance surveys, because the probe was obstructed by rocks throughout the survey. Finally, recent occupation of the site included the construction and occupation of a double-wide modular home, a garage that was used as a paint shop, and a large metal shed used for a mechanic and auto-body business. The presence of these buildings and the debris associated with the structures resulted in grids with reduced data and drastic anomalies produced by metal. Despite the identified issues, possible prehistoric alterations to the landscape were identified in the six grids.

Electrical resistance survey works on the principle that anomalies beneath the modern ground surface can be detected because their resistance to the flow of an electrical current deviates from the surrounding norm. The survey at the Haynie site (Figure 22) measured the distortion of an induced electrical field caused by subsurface phenomena such as archaeological structures or features. Grids 1, 2, and 3 (Figure 23) encompassed an area in the northwestern portion of the site where a wall that is apparently independent of the remains of the west great house had been exposed by previous mechanical digging. In the northern portion of Grid 1, a large oval area with relatively high resistance and two specific anomalies was detected. These anomalies may represent historic or prehistoric cultural deposits. Alternatively, the anomalies may represent bedrock that is fairly deep subsurface; that is, if the bedrock was shallow, the resistance values would be much higher.

Auger testing in the two identified anomalies indicate substantial depth to the deposits (greater than 1.5 m), and subsequent test trenching indicates the presence of possible structures that might have been impacted by mechanical digging and the modern occupation of the site. An aboveground water line that fed a sprinkler system was removed from the area just south of Grids 1 and 2. The resistance data did not show any clear effect from this water line. Because of extensive previous digging and the necessity to dummy-log large portions of the grids, Grids 2 and 3 did not yield definitive data.

Grids 4 and 5 (Figure 24) were located southwest of the west great house primarily in the area of the lawn that had been created after the area was leveled for the modern house; sediments from the west great house were used for that leveling. The resulting data indicate several potential anomalies in the northern and eastern portions of the surveyed area. Whether these anomalies represent undisturbed prehistoric features requires verification with either a different method of remote sensing or with excavation. Excavations in Grid 5 revealed that linear anomalies in the electrical resistance data represent intact ancestral Pueblo walls of potentially three superimposed structures that may predate the great houses (see Structures 186 and 193).

One grid just southwest of the east great house was surveyed with a gradiometer (Figure 25). This instrument works on the principle that buried artifacts, features, or differences in sediments and soils produce minute variations in the earth's magnetic field. The gradiometer measures the strength of the earth's magnetic field in different locations and records variations in those values. The gradiometer survey isolated at least two linear anomalies—one that extends east-west across the bottom of the grid, and another that is oriented diagonally in the northwest corner of the grid (Figure 26). The east-west linear anomaly follows the basic outline of the great house as illustrated on a map produced before the east great house was damaged in modern times (Figure 15). The diagonal anomaly in the northwest corner of the grid projects toward the northwest corner of the east great house and the northwesternmost kiva (Figure 21) in that great house. This anomaly may indicate a buried prehistoric feature related either to the great house or to an earlier occupation. Alternatively, the linear anomalies could be reflect one or more activities that occurred during previous digging in this portion of the great house such as historic pedestrian paths, wheelbarrow paths, or heavy equipment paths, or even indicate buried utility lines. Additional testing of this area will occur in the 2018 and 2019 field seasons.

Artifact Analysis

In-house cataloging and analysis of artifacts for the NCOP is in progress. More than 1,400 flaked-lithic artifacts and 13,500 pottery sherds have been analyzed for the project thus far. Of the 1,400 pieces of chipped stone analyzed, 600 pieces are from the Haynie site (5MT1905) and 700 pieces are from the Ida Jean site (5MT4126). Of the 13,500 pottery sherds analyzed, 4,500 sherds are from the Haynie site and 8,900 are from the Ida Jean site.

Nineteen obsidian artifacts—eight from the Haynie site and 11 from the Ida Jean site—were analyzed for elemental concentrations through energy-dispersive X-ray fluorescence by Steve Shackley (2017). All analyses were conducted on a ThermoScientific *Quant’X* EDXRF spectrometer located at the University of California, Berkeley. The artifacts were identified to two source areas in New Mexico: El Rechuelos, Cerro Toledo Rhyolite; and Valles Rhyolite in the Jemez Mountains and Grants Ridge sources at Mount Taylor. These results are similar to those of earlier studies of obsidian artifacts for Crow Canyon excavations (e.g., Shackley 2013, 2014, 2015).

Chronometric Analyses

No chronometric analyses occurred during the 2017 season. Earlier chronometric studies of the Haynie site include dendrochronology dates for the east great house and are reported by Ryan (2016a).

Curation

In accordance with Crow Canyon’s contract with the Haynie Ranch, LLC, we entered into an agreement with the Bureau of Land Management Anasazi Heritage Center, Dolores, Colorado, for the curation of collected materials from the NCOP at that repository. The Anasazi Heritage Center will take possession of these materials after the completion of fieldwork and analyses stipulated in the research design (Ryan 2016a).

Summary of 2017 and Work Plan for 2018

The first excavation season of the NCOP produced data toward understanding the development and impact of the Lakeview group, in particular, the Haynie site. Crow Canyon archaeologists used a variety of methods to gather these data—interviews, archival research, architectural documentation, surface collection, remote-sensing surveys, auger testing, and excavation. As a result of the first full season of fieldwork, we have a greater understanding of the breadth of impact to the site as a result of digging and occupation since the 1980s. Some areas thought to contain intact deposits and earlier structures proved through testing to be disturbed; other areas do appear to be intact. The longevity of occupation of the Haynie site is evidence of the importance of the site. We continue to develop relationships and collaborations with other landowners to gather additional data to better understand the wider landscape and the Lakeview community.

Testing, excavation, and analyses will continue in 2018 with grants from the Colorado State Historical Fund and Earthwatch Institute. Excavations in the western portion of the site, particularly in the area northwest of the west great house and the modern lawn, will continue to investigate three sets of possible structures and cultural deposits potentially predating the great houses. Testing will begin in the central and eastern portions of the site with trenches to identify and confirm intact deposits in those areas. Architectural documentation and stabilization will continue in the east great house with the goal of excavating in that block in 2019. Analyses of collections from the Ida Jean site as well as of artifacts and samples collected from the Haynie site will also continue. Fieldwork for the NCOP is currently designed to continue through 2020.

Personnel, 2017 Field Staff

Archaeology Department Staff

Shirley Powell, vice president of programs
Susan Ryan, director of archaeology
Caitlin Sommer, supervisory archaeologist
Shanna Diederichs, supervisory archaeologist
Steve Copeland, field archaeologist
Rebecca Simon, field archaeologist

Kari Schleher, laboratory manager
Jamie Merewether, collections manager
Michael Lorusso, laboratory education coordinator
Kate Hughes, laboratory education coordinator
Leigh Cominiello, laboratory assistant
Grant Coffey, GIS archaeologist
Kristin Kuckelman, research publications manager
Jonathan Dombrosky, seasonal field archaeologist
Jessica Petrie, field intern
Caelie Butler, field intern
Genevieve Woodhead, lab intern
Christina Stewart, lab intern

Education Department Staff

Sean Gantt, acting director of education
Paul Ermigiotti, educator
Rebecca Hammond, educator
Tyson Hughes, educator
Cara McCain, educator
Michelle Winckel, education intern

American Indian Initiatives Department Staff

Sharon Milholland, director of American Indian initiatives
Dan Simplicio, cultural specialist
Daniella Duran, American Indian initiatives intern

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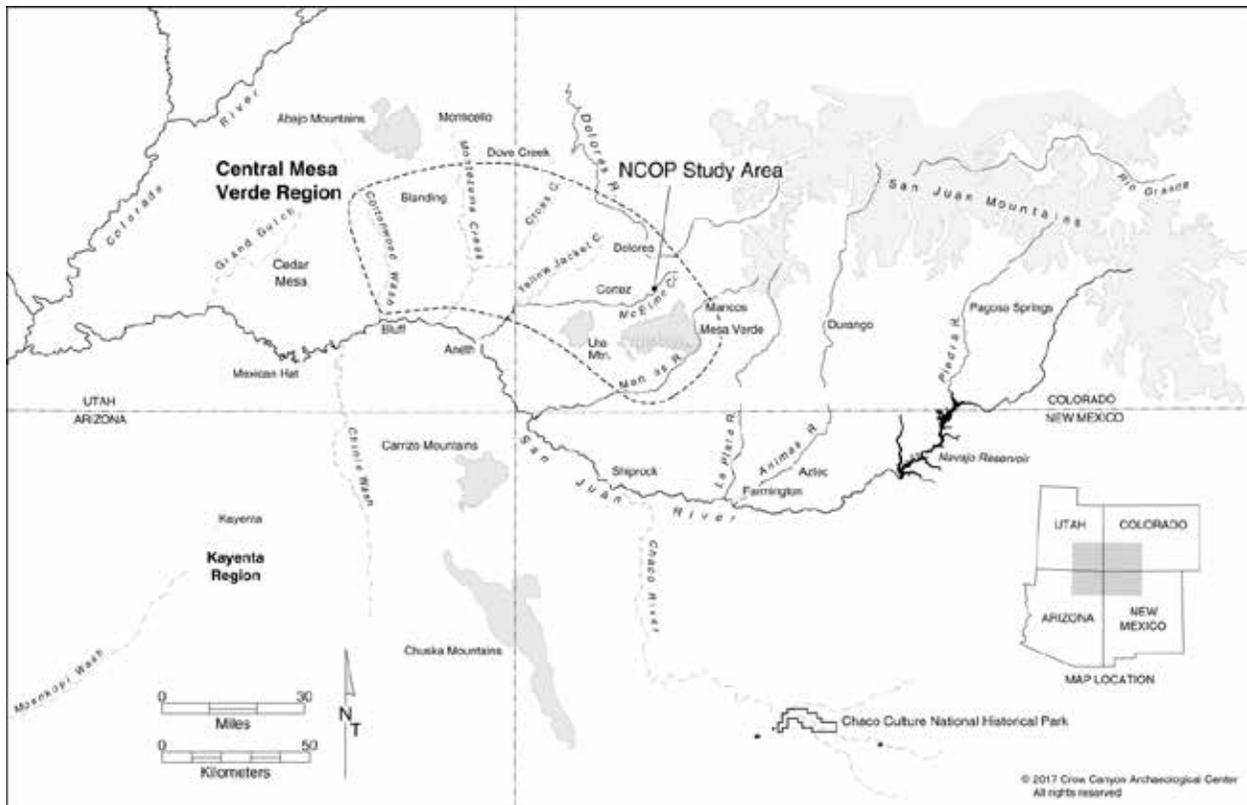


Figure 1. Location of Northern Chaco Outliers Project study area in the northern San Juan and central Mesa Verde regions.

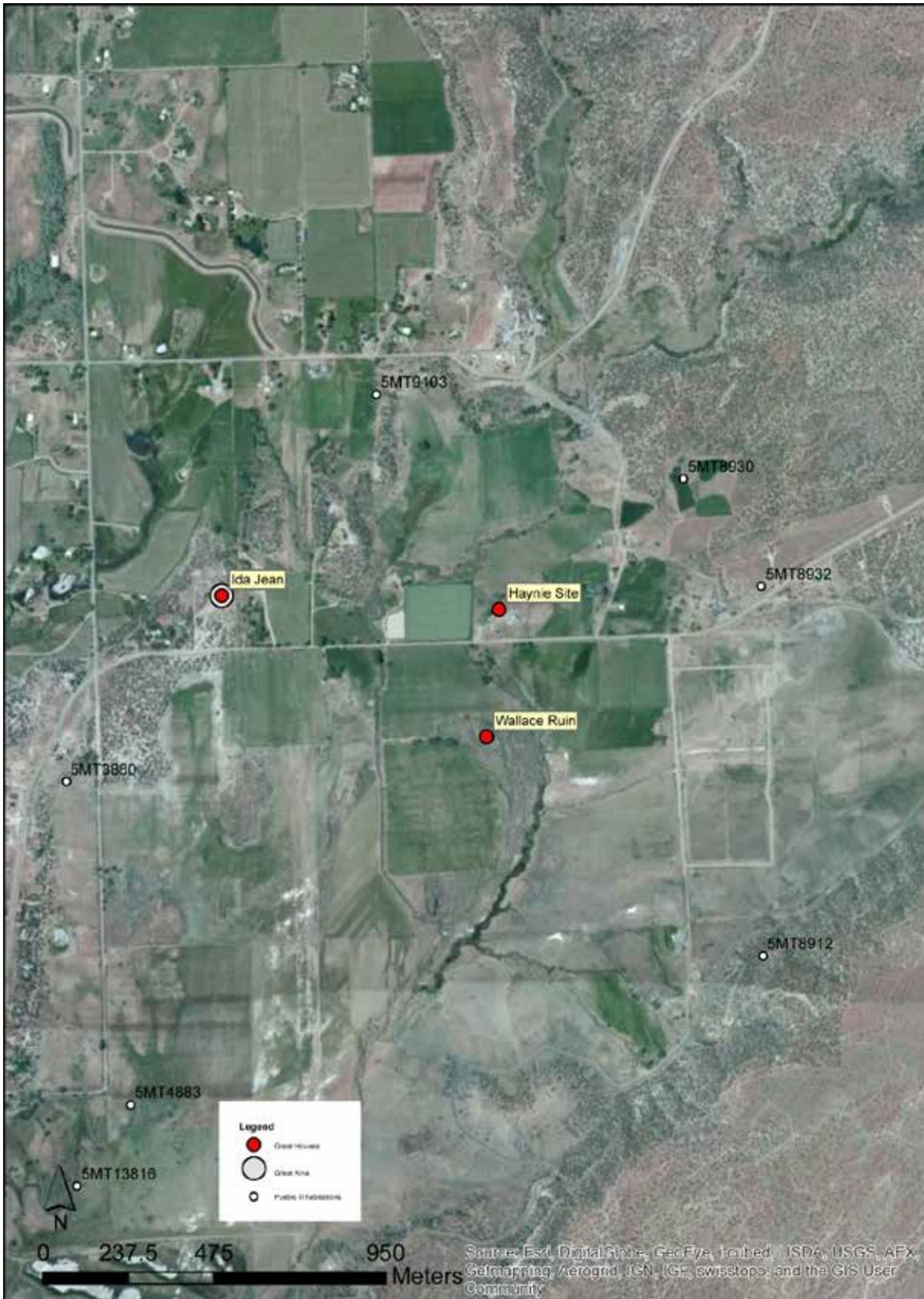


Figure 3. Locations of sites in the Lakeview group and of surrounding sites.

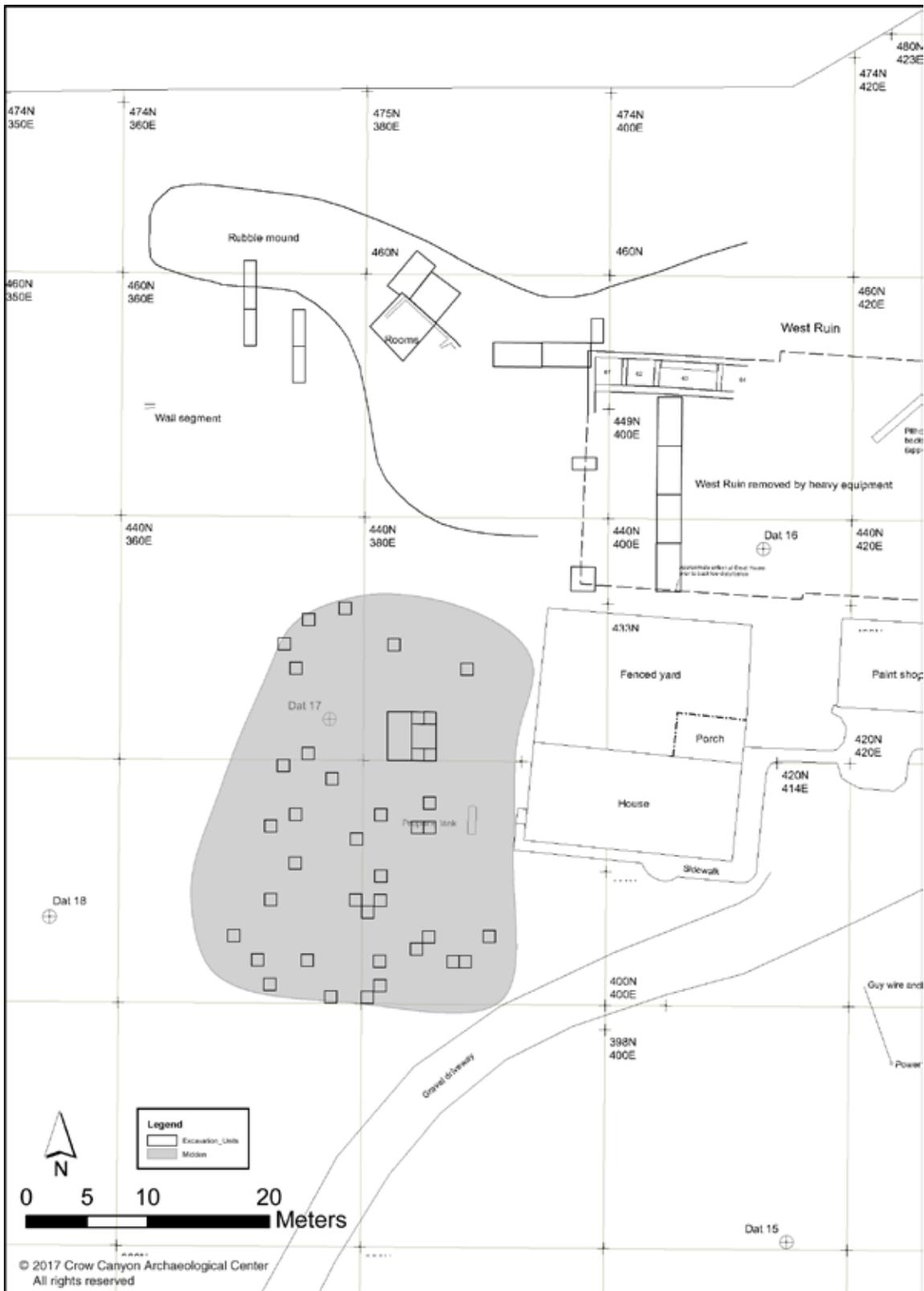


Figure 4. Western portion of the Haynie site (5MT1905) where 2017 fieldwork occurred.



Figure 5. Excavation in progress of wall and roof fall in Structures 186 and 193 (view northeast), the Haynie site.



Figure 6. North and west oblique views of Structures 186 and 193, the Haynie site.



Figure 7. Pre- and post-excitation, Feature 1, Nonstructure 187 (view south), the Haynie site.



Figure 8. Impact of mechanical disturbance on Feature 1, Nonstructure 187, oblique and profile views, the Haynie site.



Figure 9. Nonstructure 191 surface in a 1-x-2-m unit south of the remains of the west great house (view north), the Haynie Site.



Figure 10. Pre- and post-excitation, Features 1 and 2, Nonstructure 191 (view north) the Haynie Site.



Figure 11. Oblique view of the Structure 193 north and east wall segments (view east), the Haynie site.



Figure 12. The interior face of the north wall of Structure 193, the Haynie site. Note upper construction (rectangular blocks), underlying fill, and lower rock alignment.

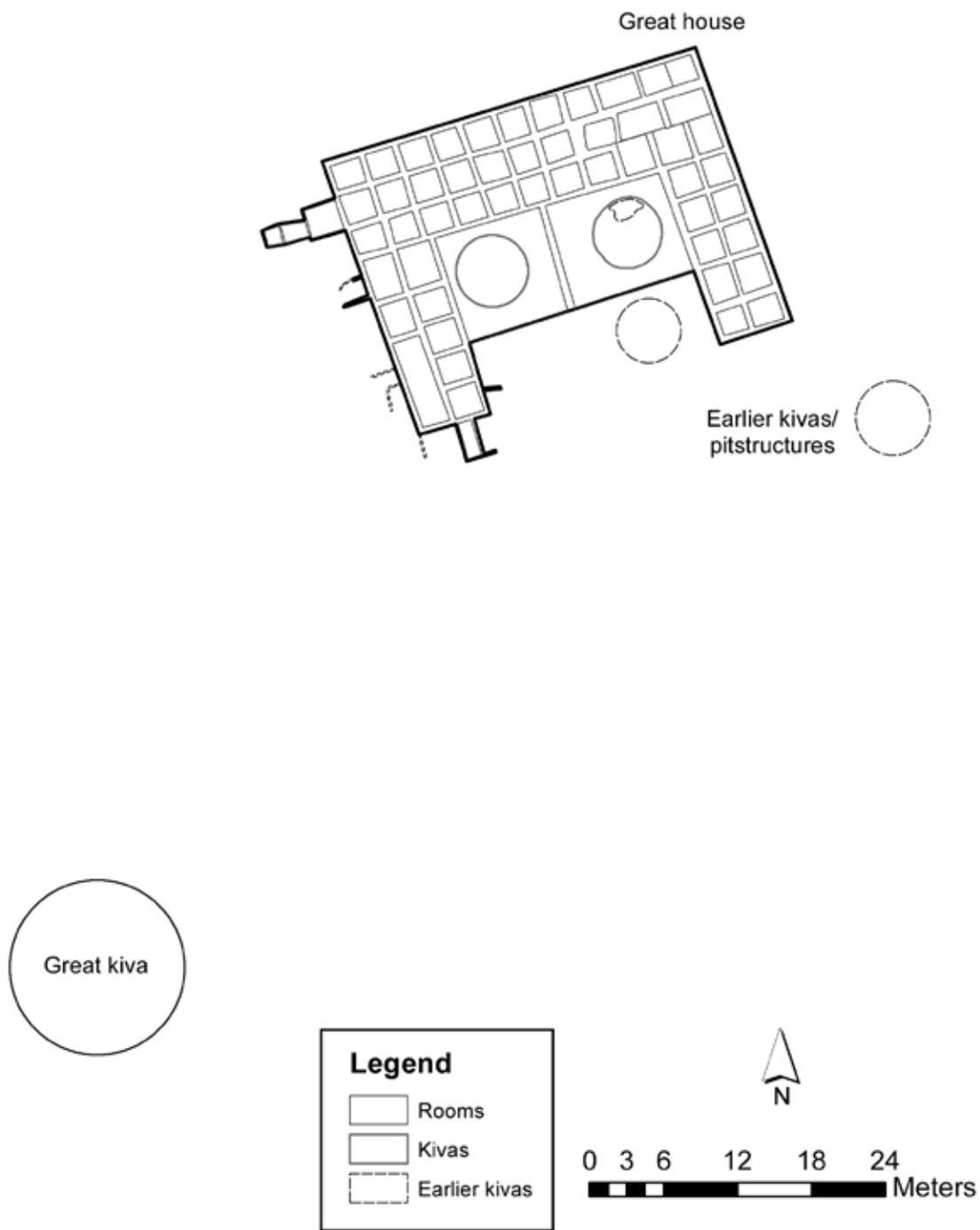


Figure 13. Ida Jean site (5MT4126). Reprinted with permission of Joel M. Brisbin.

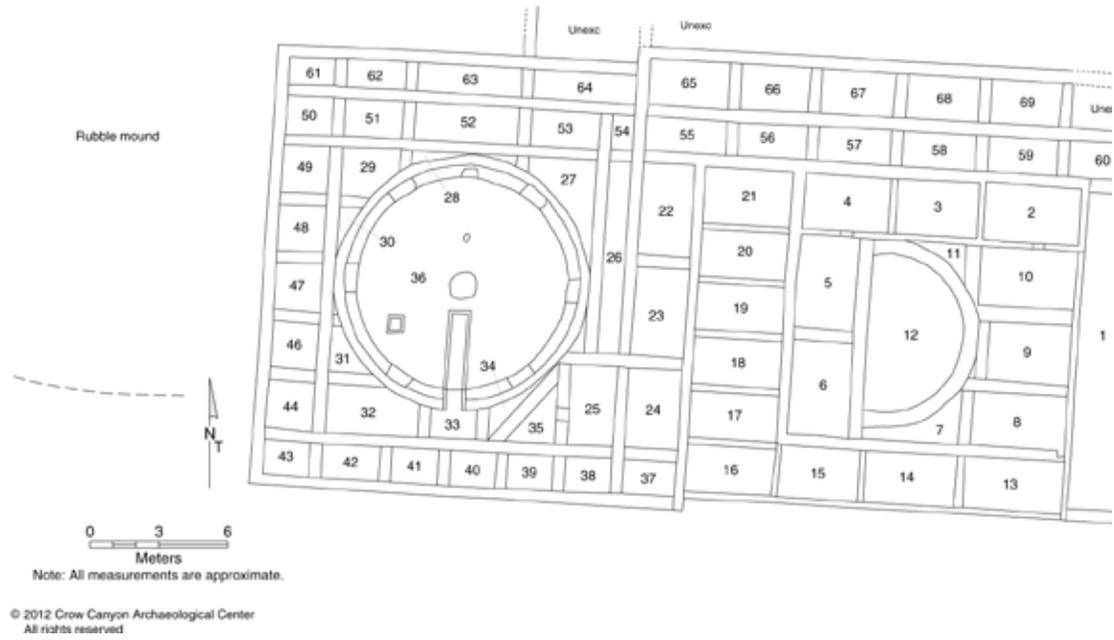


Figure 14. West great house of the Haynie site (5MT1905). Adapted with permission from Claudia Haynie.

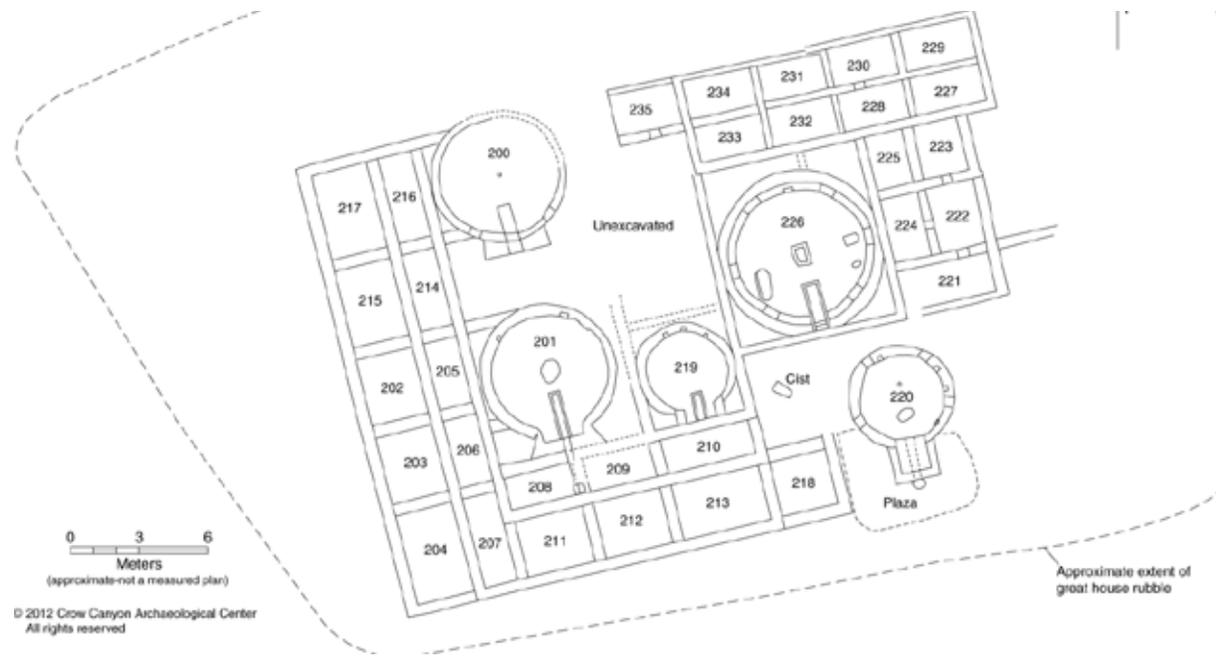


Figure 15. East great house of the Haynie site (5MT1905). Adapted with permission from Claudia Haynie.

Room 163 North Interior

Condition Assessment

Haynie Site
 @ Deadman's
 Hill



Cap:
 Suffering from
 - Unprotected mortar cap.
 water entering wall through holes.
 - Vegetation displacing stone.
 - Mortar erosion moderately severe.

- KEY:**
- ↓ Lean to South
 - LS - Loose stone
 - V - Void: Cap or wall
 - ↳ - water runoff
 - ✱ - Roots pushing on wall tops
 - - measuring point
 - - Stabilization Mortar

Structural Issues

- No leans. No threat.
- Small vertical bulge. Low.
- No cracks. No threats.
- Moderate fill pressure from behind. Low.

Material issues

- Cap open and eroding and veg damage. Severe
- Loose stones in caps. Severe.
- Water runoffs causing mortar erosion. Moderate.
- Capillary mortar erosion along base. Severe.

Figure 16. Condition assessment annotation for the interior face of the north wall of Room 163 in the west great house, the Haynie site.



Figure 18. Veneer sampling of the remains of the west great house by Earthwatch Institute volunteers, the Haynie site.

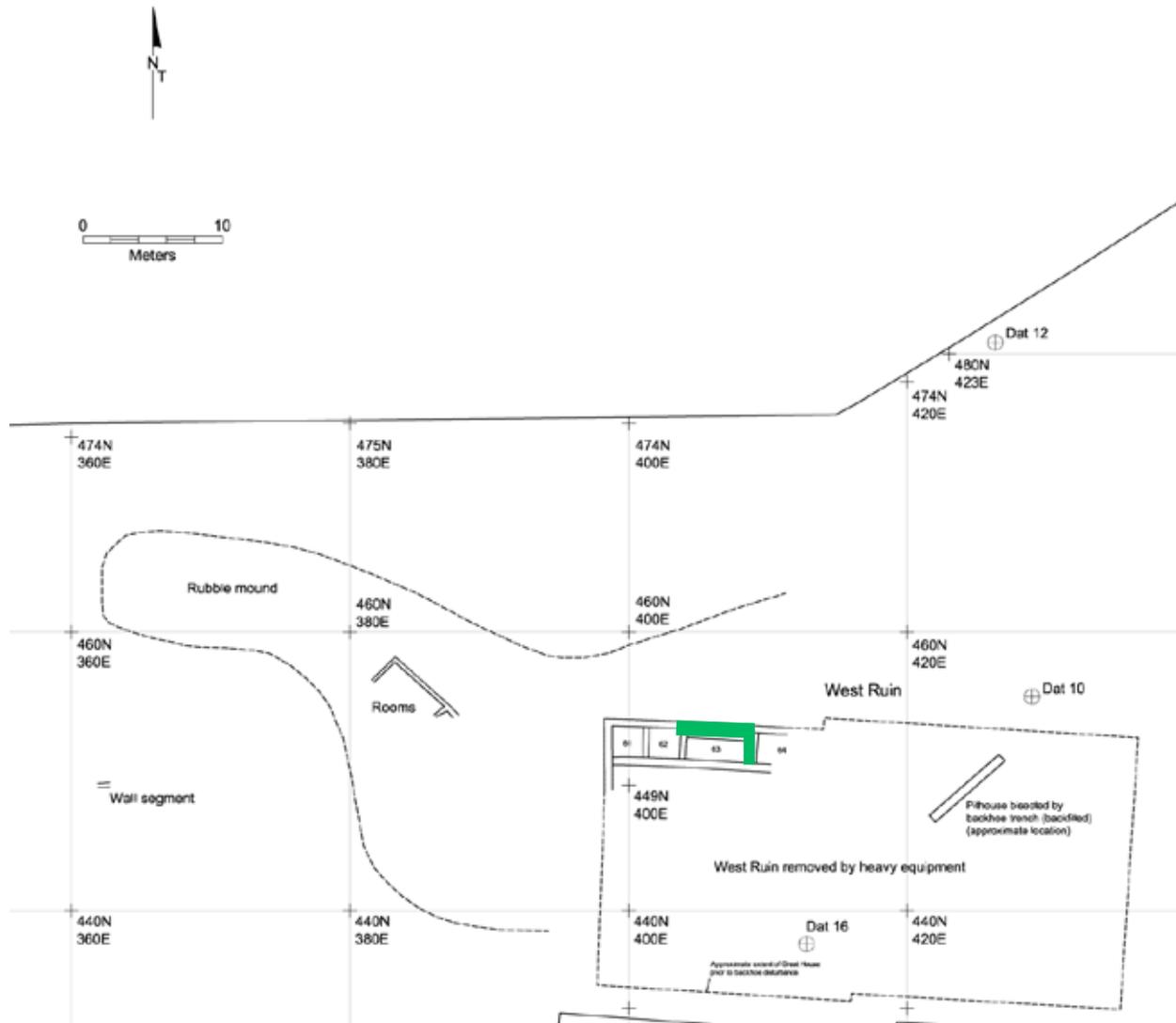


Figure 19. West great house, the Haynie site; masonry walls stabilized during the 2017 field season are highlighted in green.

NCOP
5/17/2005
West Ruin
SD 6/20/19
Room 163 North Interior

Stabilization
Documentation

Fixed/Recessed stone
prior to 2019 repair.
Possible beam socket filled
with slab stone by
J. Bricker's



J. Bricker's
Rejoining
stones on top of
wall top.
Removed and
replaced in 2019

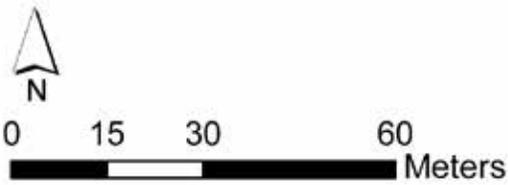
Added Stabilization
stone

Repair
June 2019
E. Bricker's

Repair
2000-2003
J. Bricker's
Used pinkish brown
mortar with
high sand

Original north wall added
vencer mortar.
light brown compact sandy loess
with sporadic large charcoal
flecking.

Figure 20. Post-stabilization annotated photograph of the interior face of the north wall of Room 163 in the west great house, the Haynie site.



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Figure 21. Locations of geophysical grids on the Haynie site (5MT1905).



Figure 22. Supervisory archaeologist Caitlin Sommer conducting electrical resistance survey in the northwest portion of the Haynie site, view north.

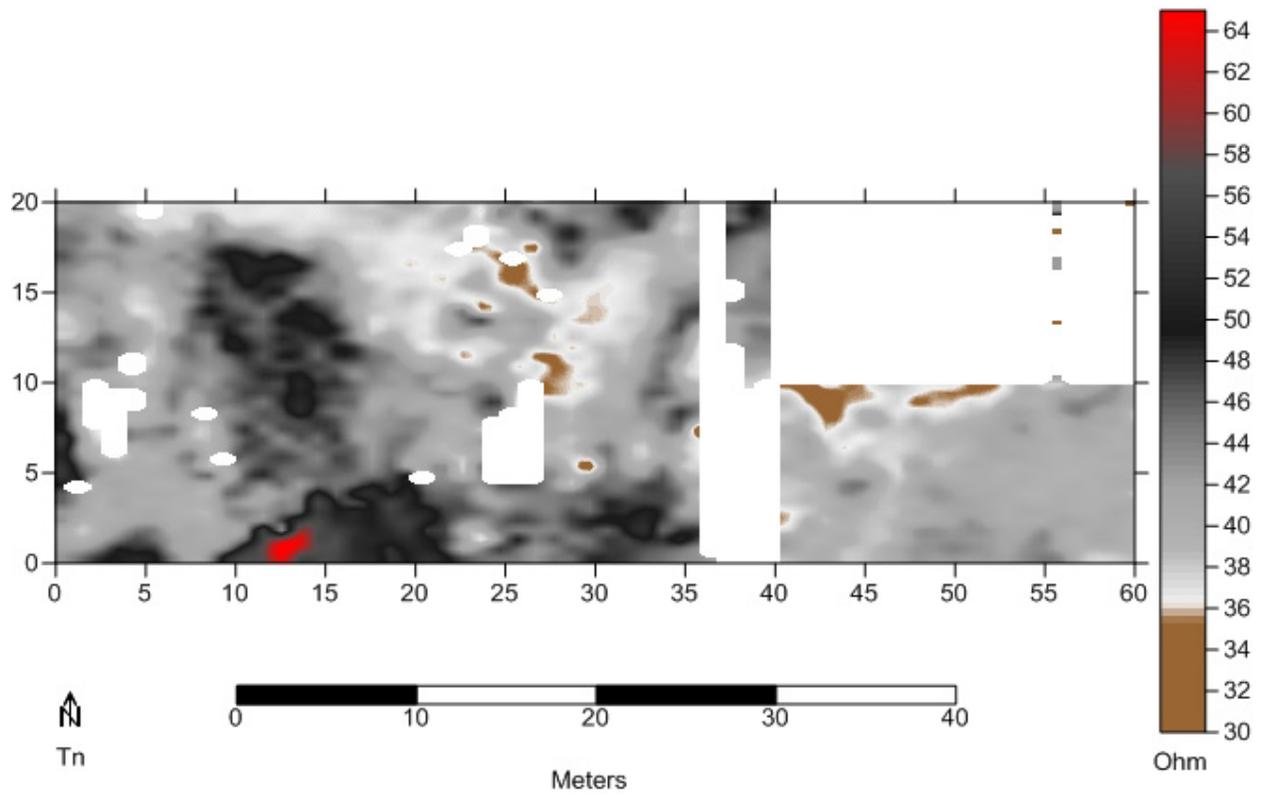


Figure 23. Electrical resistance survey Grids 1, 2, and 3 at the Haynie site. Image created by Mona Charles, Powderhorn Research LLC, 2017.

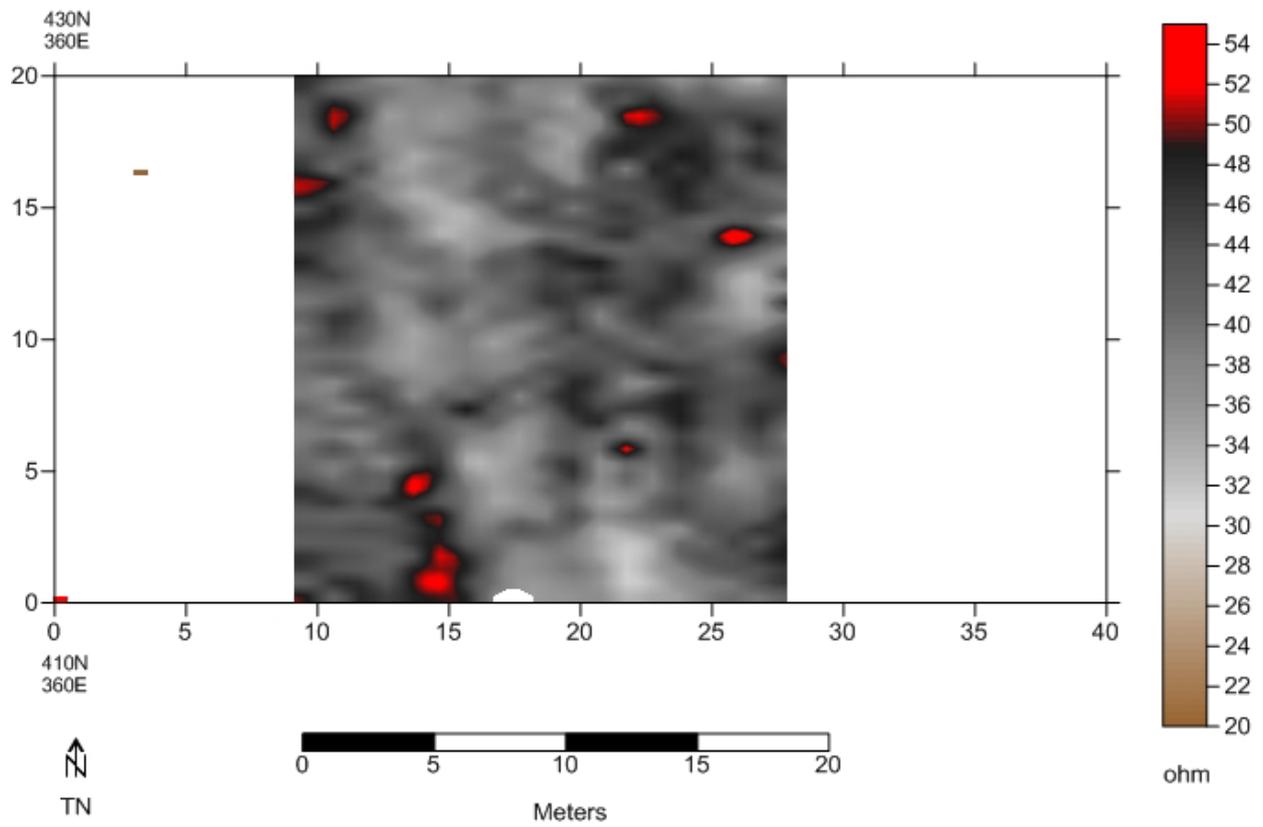


Figure 24. Electrical resistance survey Grids 4 and 5, the Haynie site. Image created by Mona Charles, Powderhorn Research LLC, 2017.



Figure 25. Mona Charles conducting gradiometer survey west of the east great house with Crow Canyon field archaeologist Rebecca Simon assisting, the Haynie site.

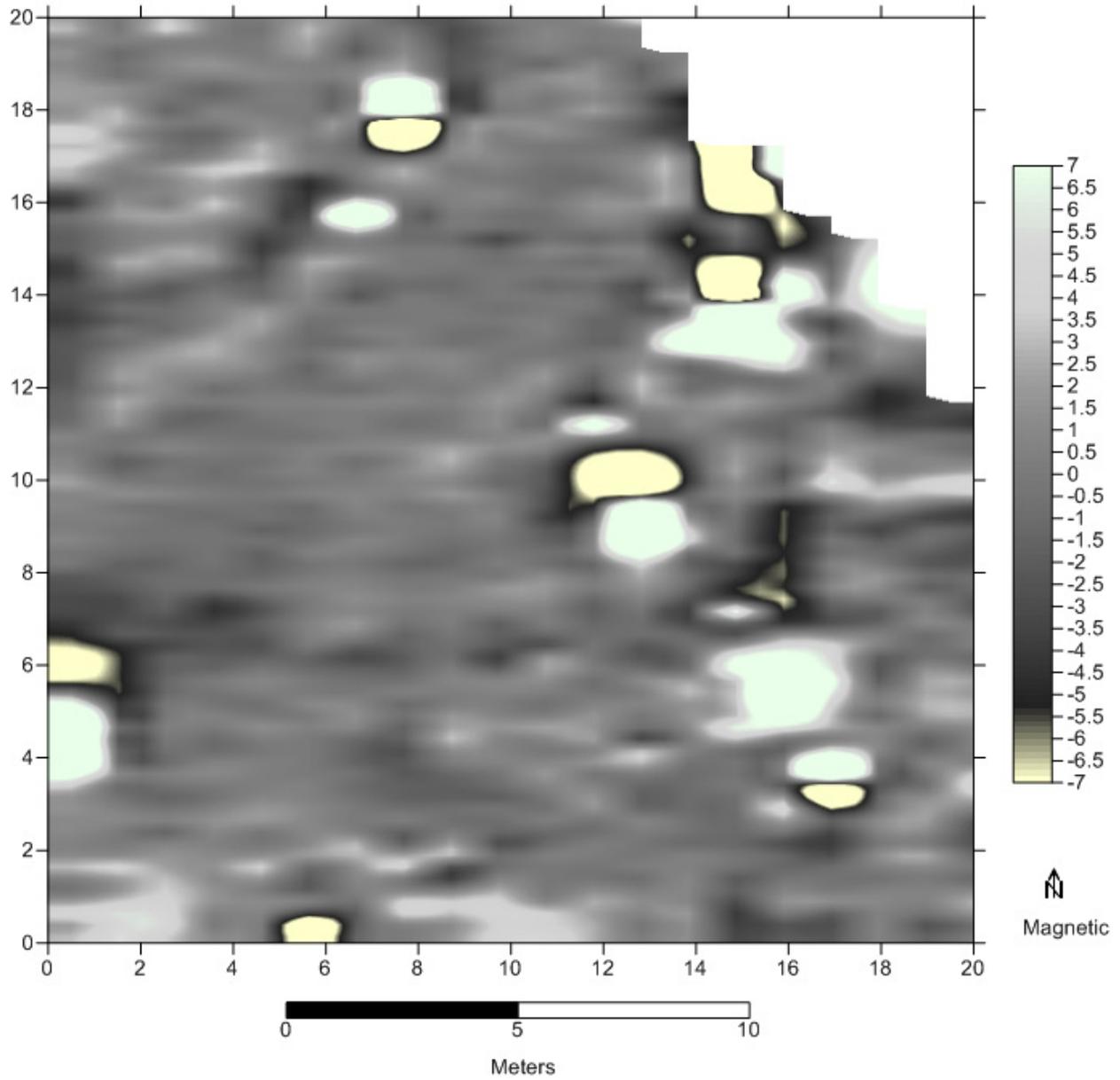


Figure 26. Gradiometer survey Grid 1, the Haynie site. Image created by Mona Charles, Powderhorn Research LLC, 2017.

Table 1. Excavation Units, 2017 Field Season, Architectural Block 100, the Haynie Site.

Horizontal Provenience	Dimensions (m)	Primary Study Unit	Open	Closed
400N 377E	1 x 1	Arbitrary Unit 179	X	
400N 380E	1 x 1	Arbitrary Unit 179		X
401N 372E	1 x 1	Arbitrary Unit 179	X	
401N 381E	1 x 1	Arbitrary Unit 179		X
403N 371E	1 x 1	Arbitrary Unit 179	X	
403N 375E	1 x 1	Arbitrary Unit 179	X	
403N 381E	1 x 1	Arbitrary Unit 179	X	
403N 387E	1 x 1	Arbitrary Unit 179	X	
403N 388E	1 x 1	Arbitrary Unit 179	X	
404N 384E	1 x 1	Arbitrary Unit 179	X	
405N 369E	1 x 1	Arbitrary Unit 179	X	
405N 385E	1 x 1	Arbitrary Unit 179	X	
405N 390E	1 x 1	Arbitrary Unit 179	X	
408N 372E	1 x 1	Arbitrary Unit 179	X	
414N 384E	1 x 1	Arbitrary Unit 170	X	
414N 385E	1 x 1	Arbitrary Unit 170	X	
416N 385E	1 x 1	Arbitrary Unit 170	X	
420N 382E	4 x 2	Arbitrary Unit 170	X	
420N 384E	1 x 1	Structure 193	X	
420N 385E	1 x 1	Structure 186	X	
421N 384E	2 x 2	Structure 186/193	X	
423N 384E	1 x 1	Arbitrary Unit 176	X	
423N 385E	1 x 1	Arbitrary Unit 176	X	
427N 388E	1 x 1	Arbitrary Unit 170	X	
434N 397E	2 x 2	Nonstructure 190	X	
434N 404E	4 x 2	Arbitrary Unit 183		X
438N 404E	4 x 2	Arbitrary Unit 183		X
444N 397E	1 x 2	Nonstructure 191		X
451N 374E	3 x 1	Nonstructure 192	X	
452.4N 390.5E	2 x 4	Nonstructure 196	X	
452.4N 394.5E	2 x 4	Arbitrary Unit 184	X	
454N 370E	3 x 1	Nonstructure 192	X	
454N 374E	3 x 1	Nonstructure 192	X	
457N 370E	4 x 1	Nonstructure 192	X	
Segment 1		Structure 197/198	X	
Segment 2		Arbitrary Unit 178	X	

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2017 *The Northern Chaco Outliers Annual Report, 2017 Field Season*. Electronic document, <http://www.crowcanyon.org/ncop2017>, accessed day month year.*

*Example: accessed 15 March 2018.

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PROJECT IMPACTS

1. Increasing Scientific Knowledge

a) Total citizen science research hours

7 hours per day per volunteer

b) Peer-reviewed publications

- 2017 Crabtree, Stefani, R. Kyle Bocinsky, Paul L. Hooper, Susan C. Ryan, and Timothy A. Kohler
- How to Make a Polity (In the Mesa Verde Region). *American Antiquity* 82(1)

c) Non-peer reviewed publications:

- <https://2017crowcanyoncollegefieldschool.wordpress.com/>
- <http://www.crowcanyon.org/index.php/archived-news/514-earthwatch-volunteers-rank-crow-canyon-first>
- <https://www.nytimes.com/2017/09/04/science/chaco-native-american-archaeology.html?mcubz=3>
- <https://the-journal.com/articles/50737>
- <http://www.mancostimes.com/article/20170709/NEWS01/170709903&template=mobileart>
- http://www.academia.edu/32384730/Surface_Archaeology_as_Site_Assessment_The_Haynie_Site_and_the_Northern_Chaco_Outliers_Project
- <http://www.crowcanyon.org/index.php/crow-canyon-s-archaeology-lab-heats-up-as-winter-approaches>
- <http://www.crowcanyon.org/index.php/haynie-site-yields-clues-to-ancient-pueblo-life>
- <http://www.crowcanyon.org/index.php/student-touches-past-at-middle-school-archaeology-camp>
- <http://www.crowcanyon.org/index.php/future-archaeologists-train-with-best-at-college-field-school>

d) Books and book chapters

Presentations:

Author(s)	Date	Venue	Title	Symposium Title
Rebecca Simon (invited)	3/31/2017	SAA, Vancouver	When Pots Walk: Reverse Archaeology at a Chaco Outlier Site in the Central Mesa Verde Region (Poster)	Poster Session: Current Ceramics Research in the American Southwest
Kari L. Schleher, Kate T. Hughes, Jamie Merewether, Michael J. Lorusso, and Grant Coffey (invited)	4/1/2017	SAA, Vancouver	Surface Archaeology as Site Assessment: The Haynie Site and the Northern Chaco Outliers Project	Poster Session: Archaeological Perspectives on the Southwestern Landscape
Susan Ryan (invited)	4/1/2017	SAA, Vancouver	Integration and Disintegration: The Role of Kiva Architecture in Community Formation and the Construction of Identity in the Prehispanic U.S. Southwest	Symposium: Architectural Studies in the U.S. Southwest: Theory, Methods, and Data
Susan Ryan (invited)	7/6/2017	Cortez, CO	The Northern Chaco Outliers Project	Four Corners Lecture Series
Grant Coffey (invited)	7/14/2017	AHC, Dolores	Photogrammetry at the Haynie Site	Hisatsinom Photogrammetry Program

Rebecca Simon (invited)	8/11/2017	Pecos - Rowe Mesa, NM	When Pots Walk: Reverse Archaeology at a Chaco Outlier Site in the Central Mesa Verde Region (Poster)	Poster Session
Rebecca Simon (invited)	8/11/2017	Pecos - Rowe Mesa, NM	“Authentic Anasazi”--“Who Cares?” Data and Dilemma from Reverse Archaeology at a Chaco Outlier Site	Four Corners and Northern San Juan (sessions arranged by region)
Kari L. Schleher, Kate T. Hughes, Jamie Merewether, Michael J. Lorusso, and Grant Coffey (invited)	8/11/2017	Pecos - Rowe Mesa, NM	Surface Archaeology as Site Assessment: The Haynie Site and the Northern Chaco Outliers Project	(Whatever they called the Northern section of the presentations)

2. Mentoring

a) Graduate students

Student Name	Graduate Degree	Project Title	Anticipated Year of Completion
N/A			

b) Community outreach

Name of school, organization, or group	Education level	Participants local or non-local	Details on contributions/ activities
See below:			

As noted in more detail in the section below, the Northern Chaco Outliers Project (NCOP) public education program has reached hundreds of students and adult volunteers from not only Colorado, but the entire nation and world, including a significant number of American Indian students from the Four Corners region. The NCOP promotes an understanding of, and appreciation for, the cultural diversity and cultural heritage that is part of our state and our nation. The students benefit the most from the educational experiences that this project provides and we hope that they will draw on these experiences as they become future leaders. In addition, the NCOP provided six college-level internships during the 2017 field season in the field and laboratory. These internships were 10 to 20 weeks in duration, depending on the position. NCOP interns were students with an undergraduate degree or in their initial years of a graduate program. These students are dedicated to the discipline of anthropology and specialize in subfields including archaeology, archaeobotany, faunal analysis, and remote sensing technologies. We also worked with 12 College Field School students from across the nation. As with the younger students mentioned above, the NCOP provides undergraduate and graduate students with the educational experiences needed to become future leaders within their communities and the discipline as a whole.

3. Partnerships

Partner	Support Type(s) ¹	Years of Association (e.g. 2006-present)
See below:		

1. Support type options: funding, data, logistics, permits, technical support, collaboration, academic support, cultural support, other (define)



Colorado State Historic Preservation Office:

Excavation, site testing, and site survey were conducted for the Northern Chaco Outliers Project under State of Colorado archaeological permits 2017-5 during the 2017 field season.

History Colorado State Historical Fund:

The History Colorado State Historical Fund awarded Crow Canyon funding to help conduct research as part of the Northern Chaco Outliers Project during the 2016 and 2017 field seasons.

Haynie Ranch, LLC:

The Haynie Ranch, LLC—a group composed of three preservation-minded individuals—is a primary partner to Crow Canyon and the Northern Chaco Outliers Project. The Haynie site, owned by the Haynie Ranch, LLC, is the focus of our multi-year research project and contains an archaeological site dating from the Basketmaker III period (A.D. 500-750) to the Pueblo III period (A.D. 1050-1280). In 2016, the Haynie Ranch, LLC granted Crow Canyon Archaeological Center permission to conduct field research at the Haynie site through 2020; work conducted follows the professional and ethical standards established by the Society for American Archaeology and the Register of Professional Archaeologists.

Resistivity Data Analysis and Reporting:

Mona Charles, an independent researcher located in Durango, Colorado, was contracted by Crow Canyon Archaeological Center to collect and process RM15 Resistivity Meter data and magnetometer data, identify possible anomalies, and report on the resistivity and magnetometer survey results.

Botanical Analysis:

Crow Canyon Archaeological Center Research Associate, Dr. Karen Adams, analyzed botanical samples collected as part of the Northern Chaco Outliers Project.

Adams State University:

Crow Canyon Archaeological Center partners with Adams State University, located in Alamosa, Colorado, to provide college credit to Earthwatch volunteers (both teens and adults). Students may earn up to two credit hours, both graduate and undergraduate, for completing the expedition and producing course-related requirements.

4. Contributions to management plans or policies

List the management plans/policies to which your project contributed this year

Plan/Policy Name	Type ²	Level of Impact ³	New or Existing?	Primary goal of plan/policy ⁴	Stage of plan/policy ⁵	Description of Contribution
See below:						

² Type options: agenda, convention, development plan, management plan, policy, or other (define)

³ Level of impact options: local, regional, national, international

⁴ Primary goal options: cultural conservation, land conservation, species conservation, natural resource conservation, other

⁵ Stage of plan/policy options: proposed, in progress, adopted, other (define)

- National or Regional Policies or Management Plans:**

In 2017, Crow Canyon Archaeological Center nominated the Haynie site to the Montezuma County Registry of Historic Places and to the National Register of Historic Places. The Haynie historic registry proposal was the first to be voted on by the County Commissioners and the first to be listed on the registry. The Haynie site was listed on the National Register of Historic Places and the Colorado State Register of Historic Places on November 13, 2017.

- Local Policies or Management Plans:**

Crow Canyon Archaeological Center's (CCAC) partnership with the Haynie Ranch, LLC continues to be active. CCAC reports updates to the LLC on a monthly basis. The partnership between CCAC and the Haynie Ranch, LLC is a unique

and successful example of not-for-profit and private landowner cooperation on conservation projects within Montezuma County, Colorado.

5. Conserving natural and sociocultural capital

a) Conservation of taxa

i. List any focal study species that you did not list in your most recent proposal

Species	Common name	IUCN Red List category	Local/regional conservation status	Local/regional conservation status source
See Below:				

ii. In the past year, has your project helped conserve or restore populations of species of conservation significance? If so, please describe below.

The Northern Chaco Outliers Project has provided an important model for the preservation of archaeological resources on private land. This model demonstrates to private land owners that preserving archaeological sites is in their long-term interest and provides them with a model for how this can be implemented. The NCOP's primary model is that of stewardship and the promotion of cultural preservation as a norm. Through this on-going work, the NCOP will contribute to the preservation of culturally significant places in southwestern Colorado and beyond by building sustainable stewardship practices and stressing the importance of our Nation's shared cultural heritage.

Species	IUCN Red List category	Local/regional conservation status	Local/regional conservation status source	Description of contribution	Resulting effect ⁶

⁶. Resulting effect options: decreased competition, improved habitat for species, range increased, population increase, improved population structure, increased breeding success, maintained/enhanced genetic diversity, other

b) Conservation of ecosystems

In the past year, has your project helped conserve or restore habitats? If so, please describe below.

Habitat type	Habitat significance ⁷	Description of contribution	Resulting effect ⁸
See Below:			

⁷. Habitat significance options: nursery, breeding ground, feeding site, corridor, migration path, refuge, winter range, summer range, spring range, fall range or other (define)

⁸. Resulting effect options: extent maintained, condition achieved, restored, expanded, improved connectivity or resilience

The Haynie site has been disturbed by historic and modern farming and chaining activities. Because the project area is located on private property, Crow Canyon Archaeological Center is unable to modify the property without permission of the Haynie Ranch, LLC. This project will not focus on enhancing, restoring, or maintaining natural populations of any species of conservation significance. However, we do encourage local landowners to revitalize and maintain the natural habitats within their private holdings.

c) Ecosystem services

Indicate which ecosystem service categories you are **directly studying** in your Earthwatch research and provide further details in the box below.

- Food and water
- Flood and disease control
- Spiritual, recreational, and cultural benefits
- Nutrient cycling

Details:

N/A

d) Conservation of cultural heritage

Provide details on intangible or tangible cultural heritage components that your project has conserved or restored in the past year.

Cultural heritage component ⁹	Description of contribution	Resulting effect
See Below:		

⁹ Cultural heritage component options: traditional agriculture, artifacts, building(s), hunting ground or kill site, traditional ecological knowledge and practices, monument(s), oral traditions and history, spiritual site, traditional subsistence living

The Northern Chaco Outliers Project (NCOP) is critically important to Pueblo people living today and to the future viability of Pueblo communities. Pueblo people face an enormous challenge—how to maintain Pueblo identity in a rapidly changing society where they are not the dominant culture. A critical means by which Pueblo people maintain their identity is by ensuring a direct connection to their past and creating a full understanding of Pueblo history. The NCOP assists in this challenge by collaborating with American Indians, including the descendants of ancestral Pueblo people, on the design, implementation, and public dissemination of knowledge gained from this project. For example, Crow Canyon Archaeological Center’s Native American Advisory Group gathered four times during the 2017 field season to discuss NCOP research findings and to provide our staff with comments and suggestions for ongoing research. Group members take this information back to their respective communities and further disseminate knowledge generated from the NCOP.

RESEARCH PLAN UPDATES

Report any changes in your research since your last proposal/annual report. For any ‘yes’ answers, provide details on the change in the ‘Details’ box. This section will not be published online.

- 1) Have you added a new research site or has your research site location changed? Yes No
- 2) Has the protected area status of your research site changed? Yes No
- 3) Has the conservation status of a species you study changed? Yes No
- 4) Have there been any changes in project scientists or field crew? Yes No

Details - provide more information for any 'yes' answers

The only changes are that the Haynie site is now listed on the Montezuma County Historic Registry, the Colorado State Register of Historic Places, and the National Registry of Historic Places.

5) Provide details on any changes to your objectives, volunteer tasks, or methods, include reason for the change.

The site, research questions, and focus of the Northern Chaco Outliers project will not be altered during the 2018 field season. There will be no changes in volunteer tasks or methods in 2018.

ACKNOWLEDGEMENTS

Crow Canyon Archaeological Center would like to acknowledge and thank all of the 2017 Earthwatch volunteers who made our field season a success. We would also like to thank Earthwatch employees for their continued support of the Northern Chaco Outliers Project. Finally, we would like to thank the Haynie ranch, LLC, Earthwatch Institute, History Colorado State Historical Fund, the National Science Foundation, and all the citizen scientists who have worked on the Northern chaco outliers Project; without their support this project would not be possible.

LITERATURE CITED

See research summary above for references cited

ANYTHING ELSE

Is there any other information you would like to provide Earthwatch?

Thank you for this incredible partnership!!

APPENDICES

Include appendices in this document or include as attachment(s) with your submission. Include the following:

- Most recent CVs for PI and co-PI(s)
- CVs of graduate students doing thesis work on the project
- Where possible, please provide the following:
- Photos, with caption and credit. If no credit is supplied, images will be credited to Earthwatch
- PDFs of papers published or in press
- Copies of any other published materials