Rimrock Draw Rockshelter (35HA3855), Harney County, Oregon: A Synopsis of the Field Excavations

Patrick O'Grady, Museum of Natural and Cultural History, University of Oregon

An archaeological field collaboration has been in place between the Bureau of Land Management, Burns District (BLM), and the University of Oregon Museum of Natural and Cultural History (MNCH) since 2011, when the first test excavations were conducted at Rimrock Draw Rockshelter (35HA38455) in September of that year. Prior to that time, field reconnaissance in the vicinity was carried out from 2009 through 2011 by volunteers with the Oregon Archaeological Society (OAS), acting under the auspices of the BLM's own Clovis Quest program. Clovis Quest was initiated by District Archaeologist Scott Thomas as a means for experimenting with predictive models for identifying Paleoindian sites and travel routes across the Burns District. The pedestrian surveys of the rockshelter site resulted in the recovery of predominantly Western Stemmed Tradition (WST) projectile points from the site surface (ca. 7,000 to 13,000 BP), followed by Northern Side-Notched (NSN) points that commonly date between 4,000 to 7,000 BP. The near absence of Elko Series projectile points suggests that use of the rockshelter became infrequent after roughly 6,500 BP when the points become very common in sites across the northern Great Basin. Points associated with bow and arrow technology (ca. 1,750 to 150 BP) like Rose Spring, Eastgate, and Pinstem are also very uncommon.

The presence of a strong Paleoindian (ca. 15,000 to 7,000 BP) representation in the lithic assemblage of the site was enhanced by the possibility that deep sediments may have accumulated on the lee side of the basalt rim. Prevailing winds in the northern Great Basin come from the southwest, which is behind the rockshelter, and one can feel the soft trickle of sand on their back as they work inside its confines. Thomas noted the dark sediments and tall sagebrush adjacent to the basalt rim when he first discovered the site. To him, the former suggested the presence of cooking fires and the latter deep, moist, nutrient-laden deposits.

2009-2011 Surveys and Testing

We decided to explore that possibility by conducting test excavations at the site in September of 2011, a BLM endeavor that was funded through their national Climate Change Initiative. The premise that led to support for the project was that all indications pointed to a Paleoindian site with deep, possibly stratified deposits. Rimrock Draw could be the rare example of an open site with multiple early components, offering the potential to answer questions about climatic changes in the early Holocene (ca. 7,000 to 10,000 BP) and perhaps the transition from the late Pleistocene to the early Holocene (ca. 13,000 to 10,000 BP).

Test excavations included Units 1 and 2, 1x2 m units on the east side of the rockshelter, and Unit 3, a 1x1 m square at the west end. The units were dug in 10 cm levels. The work progressed rapidly through loose eolian silty sands to depths of 160 cmbd in the east units and 130 cmbd in the west unit. Artifact recovery was high, crossing through surface lag; a cultural component at 70 to 100 cmbd which included Feature 1 (in Unit 1), a hearth AMS dated by sagebrush charcoal to 3,990±30 RCYBP; and a rich cultural component in Units 1 and 2 that began at 140 cmbd and continued to 160 to 180 cmbd. The latter included a transition from light gray silty sand into dark brown charcoal-laden sediment with dense artifact concentrations. An abrupt transition between the cultural component and an undulating surface composed of orange-brown clayey sand was noted, with artifact counts dropping significantly

in the underlying stratum. A variety of artifacts and ecofacts were recovered that included edge-modified flakes, scrapers, gravers, bifaces and their fragments, debitage, and charcoal. WST points were the only diagnostic projectiles recovered and bone (aside from modern rodent remains) was rare. Plans were made to return to the site with the University of Oregon Archaeology Field School (FS) in 2012, due to the depth of the sediments in association with Paleoindian artifacts.

2012 Data Recovery

The field school excavation strategy involved opening multiple units across the 20 m expanse of the rockshelter to better understand cultural material distributions, and geomorphological considerations for the site in relation to the nearby stream channel. To this end, Units 4 and 5 (1x2s) were added to the north and west of Unit 3 at the west side of the rockshelter; Units 6 and 7 (2x2s) adjacent to the north and west of Unit 2 on the east side; and Units 8, 9, and 10 (1x2s) formed a central trench with Unit 8 nearest the wall and Unit 10 furthest north. Unit 11 (2x2) was situated one meter north of Unit 7 on the east side, and Unit 12 one meter north of Unit 5 on the west side. All of the 2012 units were dug in 5 cm levels. The head start we had on Units 1 and 2 from the previous year allowed us to track the stratigraphy in 6 and 7 and served as a reference for stratigraphic consistencies and differences in the other units. Strata were found to be surprisingly consistent across the site, punctuated as might be expected by concentrations of cobbles and boulders that suggested roof or wall fall and sand and gravel lenses from occasional slopewash. Artifacts were found in abundance. The range of diagnostic artifacts expanded as both NSN and WST points were recovered in the 2012 excavations, and site features included hearths, lithic concentrations, and possible site furniture in the form of arranged boulders. The results of the 2012 fieldwork are too complex to explore in detail here. The emphasis must remain on how the early work at Rimrock sets the stage for the work to be done in the future.

The abundance of student labor allowed us to make good progress, particularly in the East Block, as we began to call Units 1, 2, 6, and 7. Although Unit 1 bottomed out as the shelter wall expanded northward, the excavators encountered a dense layer of cobbles and boulders between 160 to 200 cmbd in a matrix that lacked the chemical weathering and clay development associated with bedrock deposits. Plans were made to return to the site for additional work in September; the primary objective being to break through the rocky layer and determine if there were sealed deposits underneath.

Once again through the benefit of the Climate Change funding, the BLM hosted another two week session at the site. Terry Paddock, an expert in rock removal, was on site for the first week. Using a roto-hammer to drill holes and wedges and feathers to split the boulders, he succeeded in breaking a passage through that allowed excavation to continue in Units 2 and 6. At 262 cmbd in Quad C, the Unit 2 excavators uncovered a layer of volcanic tephra that was mapped and collected. Excavations between 260 to 275 cmbd in Quad D of Unit 2 produced fragments of tooth enamel that were larger than any herbivore found today. Below both of these finds, a multi-edged scraper was collected in Quad B of Unit 2 at 285 cmbd. Analysis by Franklin Foit of Washington State University identified the tephra as a very clean sample of Mount St. Helens Sg from the eruption that occurred 13,000 RCYBP (15,400 Cal. BP). The tooth enamel fragments were identified as camelops by Dr. Edward Davis of the UO Geology Department and myself, based on comparative material from the Juntura Formation housed in the Condon Fossil Collection. The identification is with high probability but not absolute. Blood residue analysis on the chalcedony tool was conducted by Archaeological Investigations Northwest, of

Portland, Oregon. The test yielded a positive reaction to bovine antiserum, suggesting that the tool was used to process bison at the site.

The association between the Pleistocene-aged Mount St. Helens tephra and the probable camelid tooth enamel was strengthened by the purity of the tephra sample, which had a similarity coefficient of 0.98 with primary samples. The recovery of a stone tool under both was startling, but the presence of bovid blood residue on the tool indicated that it was probably used to butcher and process Ice Age game. Bedrock was exposed at a maximum depth 325 cmbd in both Units 2 and 6. The tooth enamel was 273 cmbd in Quad D and the scraper was 285 cmbd in Quad B.

2013-2014 Data Recovery

Since the end of the 2012 field season, there have been six more seasons of fieldwork at the site. U of O field schools were offered in 2013 through 2015, and again in 2017. The 2016 and 2018 field seasons were run using volunteer labor from past FS students, researchers, and members of the Oregon Archaeological Society. The emphasis for all work at the site has focused on two objectives: identifying the paleo-environmental context and determining if the archaeological deposits in the deepest deposits at the site were intact and similar in age to those found in Unit 2.

Field work continued in a broad and exploratory fashion during the 2013 and 2014 seasons as units were added to the east and central portions of the rockshelter, test excavations were conducted on the terrace on the north side of the stream channel, and close-order pedestrian surveys of the surface manifestation of the site identified artifact concentrations in a 300 m radius of the rockshelter. Backhoe trenches were excavated both upstream and downstream from the rockshelter and a geoarchaeology field school was offered to train students in interpreting the natural and archaeological sediments at the site locality. By this time, it was understood that a thick mantle of eolian sediment blanketed the site and finding the right location for reaching the deepest sediments meant working through this material beforehand.

A clear direction for our advance into the deepest deposits came near the end of the 2014 field season, when excavators in Unit 19, four meters east of Unit 2, struck a rich, black sediment deposit at 190 cmbd in Quad B with a foliate point in association. The primary concentration of artifacts remained in Quad B through the next 30 cm, when it began to shift into Quad D to the south and closer to the shelter wall. The 2014 finds included a substantial increase in both thermally altered and unaltered animal bones, dense charcoal staining suggestive of a hearth feature, and an increase in stone tools. They included edge-modified flakes (EMFs), gravers, scrapers, cores, a WST projectile point base, the complete foliate point, 1,404 pieces of debitage, and 139 bone fragments. The rarity of cultural faunal remains across the site warranted the additional work in Unit 19, but the concentration of lithic tools surrounding the bone and charcoal-laden feature meant that important subsistence data could be had in a dateable context from a hearth and activity area combined. Additionally, the 2014 work yielded a few hairs encased in clay that indicated more delicate organic remains might be found with depth. The material was being found in the deposits under the eolian mantle approximately half a meter above the elevation where the oldest finds began to emerge from Unit 2.

2015-2017 Data Recovery

Since 2015, our primary focus is devoted to excavating Unit 19, Unit 18 to the south and extending into an alcove of the shelter wall, and Unit 20 to the north. Excavation has been slowed by an abundance of cobbles and boulders that mark the collapse of a portion of the rockshelter wall. Crews must work carefully between the rocks to remove a diverse range of objects that increases with depth, such as debitage, bone, hair, fur, feathers, plant remains, wood, moss, bisque, and tephra; recorded in situ to the maximum extent possible. In so doing, they recovered, abraders, a hammerstone, a bone tool fragment, a biface fragment, a large bifacial knife, a true blade fragment, a large obsidian multi-edged scraper similar in form to the agate tool found in Unit 2, and an end scraper made of orange agate that is identical to the material used for the Unit 2 artifact. The excavators also recovered 371 pieces of debitage and 2,490 bone fragments. Only 50 cm of fill was removed (195 – 245 cmbd), and all tools but the foliate point were recovered from the last 30 cm.

The multi-edged scraper was tested by Archaeological Investigations Northwest, Inc. (2015) for blood residues and found to react positively to equine antisera that would have to be Pleistocene in age. A total of 29 hair specimens from Unit 19 was submitted to Bonnie Yates (USFWS National Wildlife Forensics Lab [retired]) for analysis. Three of the four hair samples from the first submittal were found to be human. Dr. Yates found the specimens to be well preserved and representative of at least three individuals, with tapered ends that indicate they were not cut and thus out of character with modern human hair. Two sagebrush charcoal samples were submitted to Beta Analytic Inc. for AMS dating of the Unit 19 feature. The sample from Quad B collected above the feature at 205 cmbd, produced an AMS date of 7280±30 RCYBP (8015 – 8175 Cal. BP). The second sample from Quad D collected within the feature at 225-230 cmbd, produced an AMS date of 8150±30 RCYBP, or 9010 to 9135 Cal. BP. A second sample of sagebrush charcoal from the same level in Quad D was sent to Direct AMS for comparison, producing a date of 8114±31 RCYBP.

A bulk sediment sample from Unit 19, Quad D, collected at 225 – 230 cmbd was analyzed by Katherine Puseman at Paleoscapes Archaeobotany Services Team (PAST) for pollen, phytoliths, and macrobotanical remains and her conclusions are paraphrased here. The pollen and phytoliths produced no obvious evidence for anthropogenic activities, and pollen was poorly preserved, while phytoliths were relatively well preserved. The regional pollen record reflects a grass-dominated landscape with some forbs and sagebrush. The phytolith record indicates that bluegrass and junegrass were most common within this grassland, and typical of high altitude cool and dry steppe environments. This grassland may
have been dominated by western needlegrass, found today between 6,500 and 13,000 feet in elevation in the western US. At the site level, the phytolith record suggests that wetland grasses and sedges were common. Puseman thought it possible that this area experienced fluctuating wet and dry conditions, possibly from a late Pleistocene/early Holocene seep, then the area remained wet after it was buried due to the persistent presence of groundwater. Her finding is supported by the presence of tiny seeps above Unit 19 that still trickle a minute amount of water into the deposits below. The macrofloral record shows the burning of local sagebrush wood as fuel by the shelter occupants. In another study, Dr. Margaret Helzer has identified sagebrush, rabbitbrush, and juniper utilized as fuel woods, and willow, bulrush, chokecherry, serviceberry, bitterbrush, wada, and wapato in hearth features, used possibly for basketry and subsistence.

By the end of the 2017 field season, Unit 19 was nearing the same depth where the Mount St. Helens Sg tephra (ca. 13,000 RCYBP) and camelid tooth enamel were encountered in Unit 2 at 260-275 cmbd. At 260 cmbd, the excavators began to recover large fragments of tooth enamel (these are consistent with bison), a bison carpal, and multiple flake tools near and under the carpal. The excavators also found small orange CCS flakes in the levels just above; these are consistent with the

color and translucence of the orange agate tool from Unit 2 as well as the end scraper found just above. Six artifacts were submitted for blood residue analysis, producing four positive responses for bovine (n=2), horse, and sheep. The correlations between the orange CCS debitage, large fragments of tooth enamel and residues from Pleistocene fauna, and stratigraphic similarities in elevation suggest that the deposits extending between the units are in a pristine context and truly ancient. The consistencies across the deepest levels of the excavation are reinforced by new AMS dates that will be detailed below.

2018 Trench Studies and Salvage Work

A field school was not possible during the 2018 field season due to a lack of students. Fieldwork consisted of salvage excavation in two locations where damage occurred to unit walls, and recordation of a reference trench dug in May (O'Grady 2019a). The 25m long by 3m wide trench was cut on May 29, 2018, utilizing a John Deere 240D trackhoe, and excavated to bedrock. The trench was excavated under the supervision of Scott Thomas of the BLM, Burns District, and Thomas Stafford, Jr. of Stafford Consulting; his firm conducts geochemistry and precision radiocarbon dating services. The trench began at Units 11 and 22 in the Northeastern Block of the site excavation and was cut northward, extending to within four meters of the north edge of the stream channel which is demarcated by a low basalt rim. At the time of the initial excavation, there was no room for the trackhoe to complete a full cross section of the stream channel because of the landform constraint. The trench was then continued with a shovel to follow a lens of marsh clay that slopes upward to the north, but that was near surface work and the trench needed to be fully documented. We anticipated finishing the trenching and profiling in September. Once the trench was cut, a BLM crew worked along the base of the trench west wall, clearing away a gravel lens to expose the profile down to bedrock while Stafford cleaned the wall and extended a shovel trench further north. Over an eight day period, Stafford profiled and sampled the trench and provided consultation on next steps for archaeological work at the site. The stratigraphy of the trench allows for speculation on a generalized sequence of events at the site, subject to refinement pending the final results of Stafford's analysis. Bedrock is overlain by a high energy gravel, cobble, and boulder-strewn streambed. This is overlain by a cienega (marsh) deposit composed of thick black clay (black mud), then a lens of tephra from the climactic eruption of Mt. Mazama, reworked tephra from Mazama, and then the ca. 2 m layer of eolian sands and silts. The sediments are consistent across the expanse of the trench. Stafford noted that the cienega deposits slope upward to the north, suggesting that a series of springs may have emanated from the low basalt rim on the north end of the channel (the reason he cut a shovel trench in that direction).

During the course of cleaning the contact between the stream channel and bedrock, BLM crew member John Morlan observed multiple large fragments of ungulate tooth enamel directly atop bedrock. Thirty-eight fragments were collected at the time, some of which were processed by Stafford for AMS dating. John and Chuck Morlan collected at least six more from buckets of sediment that were wet-screened at their home in Burns. The fragments were identified by Greg McDonald of the BLM as bison. During the course of additional work at the site, periodic searches were conducted along the trench walls for artifacts and fossils. A tested obsidian cobble and three obsidian flakes were collected in the high energy stream deposit, and an obsidian flake from the cienega deposit. Stafford returned to his lab in Colorado and immediately processed four samples for AMS dating at the Earth System Science Laboratory, UC-Irvine; the bison enamel (carbonate) from the streambed contact with bedrock and three humate samples of sediment from the top, middle, and bottom of the cienega deposit (highlighted in red in the table below). Two tooth enamel samples from Unit 19 (ca. 270 cmbd) that were submitted earlier in 2017 were also returned at the same time as the sample from this year. Those

two dates are included herein, as is the date we received on camelid tooth enamel collected from Unit 2 in 2012 returned on September 8, 2017.

The exact dates are being withheld for formal publication in a peer-reviewed context. In general terms, the dates on the cienega deposit indicate that the marsh developed over a 500 year period that ended near the same time as the climactic eruption of Mount Mazama, and the stream channel was running strong during Clovis times. The dates on the camelid tooth enamel from Unit 2 and the bison tooth enamel from Unit 19 suggest that the most ancient archaeological deposits in the site are well preserved and precede Clovis-aged sites by thousands of years. Rimrock Draw Rockshelter appears to be one of the oldest archaeological sites in North America.

The 2018 salvage work utilized volunteer labor and pursued a limited range of objectives. The field crew consisted of Patrick O'Grady as supervisor, three former field school students who volunteered their services, three volunteers from the OAS, and two from our research excavations elsewhere in Oregon. Additional assistance was provided at times by professional colleagues. Digging occurred only in Units 37 and 38 (new), using trowels and other hand tools to excavate in 10 cm levels. Unit 37 is adjacent to the west of Units 18 through 20. Unit 38 is adjacent to the west of Unit 22. This work was considered to be salvage excavation meant to alleviate unsafe conditions and prevent additional loss of data as a result of active wall collapses. The excavation work occurred from ladders until the walls were stabilized, then from platforms of sandbags stacked within the excavation blocks. All material was be screened through 1/8 inch hardware cloth.

During the trackhoe excavation, I requested that the sediment removed from a section near the rockshelter be placed in two piles, one consisting of the more recent eolian sediments and the other from the Mazama ash layer to bedrock. Avocational volunteers screened the older deposits for cultural material and fossils, then concentrated on the more recent deposits. They collected all non-diagnostic obsidian or CCS artifacts that were larger than a quarter (coin) for use as a teaching set. Also, a chert scraper and a large fragment of incisor from an herbivore was recovered from the old pile, and a WST fragment from the eolian pile. They also assisted in screening the fill that fell into Unit 19 from sloughing after winter storm damage.

2019 Fieldwork

The 2019 fieldwork included the excavation of an extension onto Trench 2018-1 in May of 2019 that started at the north terminus of the section dug the previous year and continued onto the north terrace on the opposite side of the stream channel from the rockshelter. The extension was added to allow sedimentary profiling of strata where a spring may have originated that provided water to feed a cienega or shallow marsh entering the channel from that side. Colluvial deposits are overlain by alluvium that slopes southward in the direction of the channel, which could only have been created by a water source originating upslope from that vicinity. A second trench, 2018-2, was excavated downstream (westward) from the rockshelter in October of 2018, also on the north side of the channel to study transitions related to streamflow. This short trench starts at the channel margin and extends onto the terrace above. The trench was extended in 2019 to bring it closer to a dense concentration of lithic material where diagnostic Paleoindian formed tools and debitage have been recovered, beginning with the first surveys in 2009.
Archaeological excavations in 2019 included a series of three contiguous 1x2 m units designated Units 37, 38, and 39; four 50x50 cm test units designated 2019-1, -2, -3, and -4; a 1x1 m unit (Unit 40) that was excavated with 2019-1 as its southwest corner; and another 1x1 (Unit 41) that included 2019-3 as its

southeast corner. Along with the excavation work, periodic pedestrian surveys were conducted as training exercises and to reexamine the landscape after heavy rainstorms.

The 2019 field school program was divided into four sections for student educational development: 1) establishing regional context, 2) lithic identification, 3) beginning excavation techniques, and 4) advanced excavation techniques (O'Grady 2019b). The first week was devoted to introductory information that included lectures and field trips to Sagehen Gap Clovis site (35HA3548), Malheur National Wildlife Refuge, French Round Barn, and other locations of archaeological and historic interest; a tour of the Harney Basin and surroundings to establish geographical context; and walking tours of the area surrounding Rimrock Draw Rockshelter to provide environmental and cultural context for the site and setting. The second week consisted of a five-day lithic workshop conducted by noted lithic analyst Dan Stueber, who trained students in flintknapping, and stone tool and debitage analysis; information vital to any student's ability to identify significant artifacts during the course of excavation. Each day of instruction was followed by field trips to nearby Paleoindian sites of interest to practice newly developed skills and enhance understanding of the archaeological context of Rimrock Draw.

The third week brought a change from introductory studies to field work, with students beginning the process of excavation in 1x2 m units in a new area across the stream channel from the rockshelter (the North Locus) and in 50x50 cm units near the shelter. Both types of units were well suited for training students in basic excavation techniques prior to working in the more complex rockshelter units, allowing for the opportunity to develop ability at hand excavation, horizontal and vertical measurement, note-taking, and recordation on probe and level records. Weeks four through six marked the transition from introductory to advanced excavation, with students shifting between the North Locus and Unit 18, located in the oldest and most archaeologically challenging portion of the site.

Students were trained in three phases of archaeological investigation, including Phase 1: pedestrian survey techniques, Phase 2: test excavation, and Phase 3: data recovery. Surveys were conducted within a 300-m radius around the rockshelter on multiple occasions this year due to the exceptionally rainy summer. The surveys provided students opportunities to practice their identification skills during times when the excavation units were too wet (preventing damage to the units) and when stone tools were washed clean. The surveys resulted in the recovery of 10 Parman stemmed points (13,000 to 8,000 BP), one Windust point (13,000 to 9,000 BP), one Northern Side-notched point (7,500 to 4,000 BP), two Great Basin Transverse points (13,000 to 8,000 BP), two foliate points (including one Cascade), two drills, two burins, ten biface fragments, two scrapers, two edge-modified flakes, four overshot flakes, and one cobble core of exceptional quality. The chronologically diagnostic projectile points indicate a minimum time range of ca. 13,000 to 6,000 CAL BP.

The two primary excavation areas were the North Locus and Unit 18. The North Locus was established to explore archaeological deposits around a possible spring on the north side of the stream channel. The location was made evident after trackhoe trenching revealed that hydrologically altered sediments originate upslope from the stream deposits on the north side of the channel, thus water was flowing into the stream from a location on or adjacent to the terrace. The relationship was first noted by Stafford during stratigraphic profiling of the trench stratigraphy in 2018. Stafford observed that use of the spring would probably have been coeval with human activity at the rockshelter and excavations at the location would reach similarly aged deposits, including Mazama ash, marsh clay, and steam gravel a meter higher than at the rockshelter itself. If that proved to be correct, the excavation crew would save considerable time plus avoid the challenges of breaking through a collapsed portion of the rock wall in the shelter deposits.

The trench was extended northward onto the terrace in June of 2019, and three contiguous 1x2 m units (Units 37, 38 and 39) were established parallel to the trench, extending north to south. The initial excavation work was conducted by volunteers from the Oregon Archaeological Society. Seventeen members contributed a total of 680 hours of labor to the effort from July 1 through 12, excavating from the surface through eolian deposits to ca. 120 cm below the surface to clear the way for students to reach the strata of primary interest; cienega muds and underlying basal fluvial gravels. Next, the student excavators dug through the remaining eolian sediments, a layer of Mazama ash, and finally into the marsh clay and basal steam gravels. Bifaces and their fragments, flake tools, scrapers, projectile point fragments, bone tools (including a needle tip), and debitage began to increase in abundance in the Mazama and marsh deposits, confirming our hypothesis that the most ancient strata at the site are closer to the surface and more easily accessible than adjacent the rockshelter. No diagnostic projectile points were recovered from the excavation but a chert foliate point and a large obsidian Western Stemmed point were found during work in the adjacent trench in 2018, indicative of a minimum time range between 13,000 to 7,000 CAL years BP at the location. The student crew excavated 30-cm into the marsh and stream deposits by the end of the field season, while at least 1.5 m of archaeological sediments remain unexcavated above bedrock.

Work at Unit 18 was time consuming due to the density of formed tool fragments, edge-modified flakes and debitage at the location, the extensive training needed to prepare students for excavation there, periodic heavy rainstorms that hampered excavation in the sticky clay sediment, and the cramped working conditions deep in the back of the rockshelter. Debitage, stone tools, hair, fuel wood, plant seeds, bone tool fragments, and hundreds of pieces of bone and ungulate tooth fragments (including a piece of Pleistocene bison bone), were collected. We estimate that bedrock is approximately 40 cm below our current excavation level, and we collected bison teeth fragments dated to ca. 14,000 RCYBP (ca. 17,000 calendar years) at 10-cm above the current level in 2017. At 270 to 275 cm we recovered two burned seeds identified as juniper by Dr. Margaret Helzer, and other large pieces of charcoal were collected in a concentration that appears to be an emerging hearth or cooking feature. The large charcoal fragments, which measure approximately 1 to 5 mm, were unlike any found previously in terms of size and preservation. They should be identifiable to species and suitable for AMS radiocarbon dating. Students excavated a total of five levels in Unit 18, or 25 cm of fill over the course of two weeks.

The focus of the 2019 excavation work was on the completion of Units 18 through 20 down to bedrock. That was not possible due to the small crew and complexity of the excavation. Work on the units will continue in 2021. At the North Locus, we planned to excavate up to three 1x1 m units adjacent to the north edge of the stream channel. Stafford's hypothesis proved to be correct and we were able to reach the oldest, more shallow strata more easily to the north. At that north position, the cienega deposits are only 110 cm below ground level, while they are 200 cm or more below modern ground level to the south. The collaboration with Oregon Archaeological Society was vital to our progress and provided sufficient labor to remove overburden without loss of data, thereby enabling students to excavate pre-Mazama deposits sooner than at the south end. In fact, the collaboration allowed us to excavate three 1x2 m units on the north side - twice as much coverage as we initially anticipated.

What Comes Next

In 2021, we will be entering the tenth season of work at Rimrock Draw and our seventh field school there. Long range, future plans include the reduction of archaeological excavations and an

increase in stratigraphic research on the stream channel. It will take several years to bring the archaeological work to a close and we intend to operate a field school and volunteer outreach program through at least the summer of 2022. One key change during the next three years will be to impose limitations on opening new excavation units and to complete those already open. It will be necessary to complete Units 18, 19 and 20 by taking them to bedrock and continuing Units 37, 38 and 39 through the clay and stream gravel deposits associated with the possible spring at the North Locus. Units 37 through 39 are also challenging because of the dense clays and gravels that have hardened into a cement-like matrix that requires both rigorous physical effort and delicate excavation to prevent damage to artifacts, and to record their locations *in situ*. Both excavation loci will be slow and difficult to excavate. There are still unanswered questions regarding the relationship of some portions of the site to the rockshelter itself. The continued use of 50x50 cm test units and geologic auger probing on the east and west margins of the shelter will help to fill in those blanks, as well as provide opportunities for students to train in Phase 2 testing procedures.

Plans for 2021 also include the expansion of the downstream Trench 2018-2 southward to bisect the stream channel, with plans to excavate two more trenches at regular intervals further down. The effort will capitalize and build on the knowledge that a five-part stratum depositional sequence exists near the rockshelter, and that, from oldest to youngest, these strata comprise basalt bedrock, basal cobble and boulder stream gravels, marsh clay, Mazama tephra, and eolian sand and silt. Our reasoning for pursuing a multi-trench strategy will require some background for context, which follows:

Rimrock Draw Rockshelter is essentially an "open-air site", meaning that the early inhabitants took advantage of the protection offered by a shallow (ca. 3 m deep and 20 m long) overhang in an otherwise open landscape for protection from precipitation, wind, or sun, depending on the season. A permanent stream was adjacent to the shelter during the earliest occupation of the site between ca.18,000 to 9,000 CAL BP, after which a cienega formed by a combination of weak and intermittent steam flow, and springs between 9,000 to 7,600 CAL BP. The oldest deposits immediately overly bedrock near the back wall of the rockshelter and are approximately dated by large Pleistocene-aged herbivores.

Characteristics of the deposit include smaller, extant animal species, flake tools of obsidian and cryptocrystalline silicates, fuel wood, burned seeds, hair, and a predominance of obsidian debitage. Dates associated with the oldest use of the rockshelter range from ca.18,000 CAL BP to 17,000 CAL BP on camelid and bison teeth, respectively, and also on a ca. 13,000 CAL BP bison tooth on bedrock at the base of the stream channel, found in association with obsidian debitage. Thus, the physical evidence from the site indicates human use is associated with the stream channel between ca. 18,000 to 13,000 BP.

Temporally diagnostic stemmed projectile points dating between ca. 13,300 and 7,000 BP are also found in the rockshelter, as well as across the surface in a 300 m radius surrounding it. We base the older temporal boundary on the discovery of Western Stemmed points under Clovis-aged deposits at Paisley Caves (Jenkins et al. 2012) and the 13,300 to 12,800 CAL BP date range for Clovis established by Waters and Stafford (2007). The 7,000 year terminus of site use is estimated by the abundance of Northern Side-notched points (n=30) which date between 7,300 and 4,500 CAL BP (Grayson 2011), and the paucity of Elko Series points (n=5) whose age range is 6,500 to 1,000 CAL BP. Elko points are considered to be the most common type of projectile point found throughout the northern Great Basin. Other projectile points coeval with Elko, and later points crafted for use with bow and arrow (ca. 1750 to 150 BP) are also rare at the site. The chronological associations suggest that there is a period of use at the site between ca. 18,000 and 13,000 CAL BP that relates to human activities oriented to the

presence of the stream, and a period tied to later use of both the stream and cienega that was much more pronounced between 13,000 to 7,000 CAL BP. The stream was visited infrequently in the 18,000 to 13,000 CAL BP period and human presence then is confined to a few small areas, whereas site use was frequent and widespread during the time the cienega was present between 9,000 to 7,600 BP. The fact that large and widespread lithic scatters on the ground surface do not occur further downstream may indicate that the cienega and related spring were the only water feature (and the key attraction) after the stream stopped flowing. It is both reasonable and likely that the earliest people at this rockshelter utilized other protected locations along the stream further down and they would have been much more common when the ground surface was nine feet lower, as it was during that time.

Rimrock Draw Rockshelter is tremendously important due to its antiquity, but in practical terms, it may be equally important as a model or a new search image for finding other similar aged, open-air sites in the northern Great Basin and beyond. Caves and rockshelters throughout the arid Great Basin have been magnets for archaeological research for decades because of the remarkable preservation conditions for perishable resources in these hyper-arid caves and their antiquity, often overlapping with the Clovis period. First visited by pioneering archaeologists and later by scholars hoping to improve on the original work, such locations are rare, finite, and non-renewable ancient resources and each new excavation has its effect, reducing their already scant contents by that much more. Caves were often used more for storage than for occupation and they offer less in terms of understanding the human ecology of a region than open-air sites. Rimrock Draw is as much an open-air site as a rockshelter and the conditions for preservation are, for the most part, equivalent to open-air site conditions. To date, there has been little previous work to identify the characteristics that should be considered when searching for open-air sites with intact stratigraphy in desert country. These open-air sites may be less common than late Holocene occupation sites, but they exist in significantly higher numbers than caves and rockshelters and the answers about where to look and how deep are quickly being understood. Our work to understand the
natural and cultural relationships between the streams and their terraces, the rockshelter, the surface above it, the drainage basin, and the broader regional context will be invaluable when searching for other open-air sites. As caves and rockshelters are excavated and become depleted as archaeological resources, open-air sites and especially those buried deeply in alluvium will become the future for archaeological exploration and discovery.

Based on the context provided above, we are testing Rimrock Draw to locate the oldest, stream-oriented archaeological components by excavating three additional trenches cross-cutting the channel downstream from the rockshelter. The intent is to, first, identify the overall stratigraphic sequence for the entire stream channel, and, second, identify statigraphic units that are consistent with the stream channel deposits, where the oldest archaeological component is evident at the shelter. If the oldest site occupations are associated with the stream, then other sites of similar age have a high probability of occurring downstream. The 2021 trenching will be a continuation of Trench 2018-2, extending southward across the channel to a basalt rim on the opposite side which may have been a sheltered location during the early period. The trench already extends onto the north terrace where a dense concentration of debitage and tool fragments has produced crescents, Haskett points, Black Rock Concave Base points and evidence of overshot technology, all early time markers in the region. Work at 2018-2 would be an intermediate step in the process, trenching across the channel from an extant portion of the surface site currently associated with the rockshelter. Trenches will be excavated each year further downstream from the rockshelter, with each one being more exploratory than the previous. Stratigraphic profiling, sample collecting and stratigraphic descriptions will occur at each location, creating a record of the stream morphology, and perhaps locating more evidence of the oldest occupations. If conditions similar to the rockshelter strata are noted or artifacts are found in the deep

strata of the trench wall, then a decision will have to be made regarding the implementation of archaeological excavation.

Summary

This overview provides an update on archaeological activities that occurred from 2011 through 2019 and those we plan to pursue from 2021 through 2022; perhaps beyond. The summation reflects the transition from our previous focus on the rockshelter to a more regional study of different landscapes and especially, alluvial deposits whose archaeological records lie meters below the modern ground surface. We will continue our work in units that have already been established and which can provide important information about the earliest occupations in the rockshelter and units that will enhance our understanding of the use of the spring on the north side of the stream channel. We will excavate trenches downstream from the rockshelter that will allow better understanding of the characteristics of the stream channel, and, hopefully, identify stratigraphy that relates to the earliest human use of the locality. We intend to expand our regional knowledge through increased pedestrian surveys of the playas and drainages that surround 35HA3855. These surveys will help place Rimrock Draw Rockshelter into a broader regional context that will integrate all currently documented Paleoindian lifeways in the vicinity.

Rimrock Draw Rockshelter is a remarkable site. We scientists have a tremendous responsibility to report the site fully and carefully to our sponsoring agencies, the professional archaeological community, and to the public. The time has come to direct our efforts towards the completion of outstanding archaeological excavations and answering questions about its geological and regional context; in other words, bring site activities to a close and work to answer the unanswered questions. There is still much to be done before that happens and there will be abundant opportunities for students, volunteers and researchers over the next two years. At the same time, there is enough information available to begin telling the story of site through the radiocarbon dates, the larger cultural and geological trends, and aspects of the material culture.

References Cited

Grayson, Donald K.
2011 *The Great Basin: A Natural Prehistory*. University of California Press, Berkeley.

Jenkins, D. L., L. G. Davis, T. W. Stafford Jr.., P. F. Campos, B. Hockett, G. T. Jones, L. S. Cummings, C. Yost, T. J. Connolly, R. M. Yohe 2nd, S. C. Gibbons, M. Raghavan, M. Rasmussen, J. L. A. Paijmans, M. Hofreiter, B. M. Kemp, J. L. Barta, C. Monroe, M. T. P. Gilbert, and E. Willerslev.
2012 Clovis age Western Stemmed projectile points and human coprolites at the Paisley Caves. Science 337, 223–228 (2012).

O'Grady, Patrick
2019a Project Proposal: 2019 Fieldwork at Rimrock Draw Rockshelter (35HA3855), Harney County, Oregon. Submitted to Burns District Bureau of Land Management, Hines, Oregon.

2019b Proposal for 2020-2022 Research at Rimrock Draw Rockshelter (35HA3855), Harney County, Oregon. Submitted to Burns District Bureau of Land Management, Hines, Oregon.

O'Grady, Patrick, Scott P. Thomas, Thomas W. Stafford, Jr., Daniel Stueber, and Margaret M. Helzer
2019 The View from the Trenches: Tying Paleoenvironment to Archaeology at Rimrock Draw Rockshelter. Paper presented at the 84th Annual Society for American Archaeology Meetings, Albuquerque, New Mexico, April 12, 2019.

Waters, M. R., and T. W. Stafford Jr.,
2007 Redefining the age of Clovis: Implications for the Peopling of the Americas. Science 315, 1122–1126.