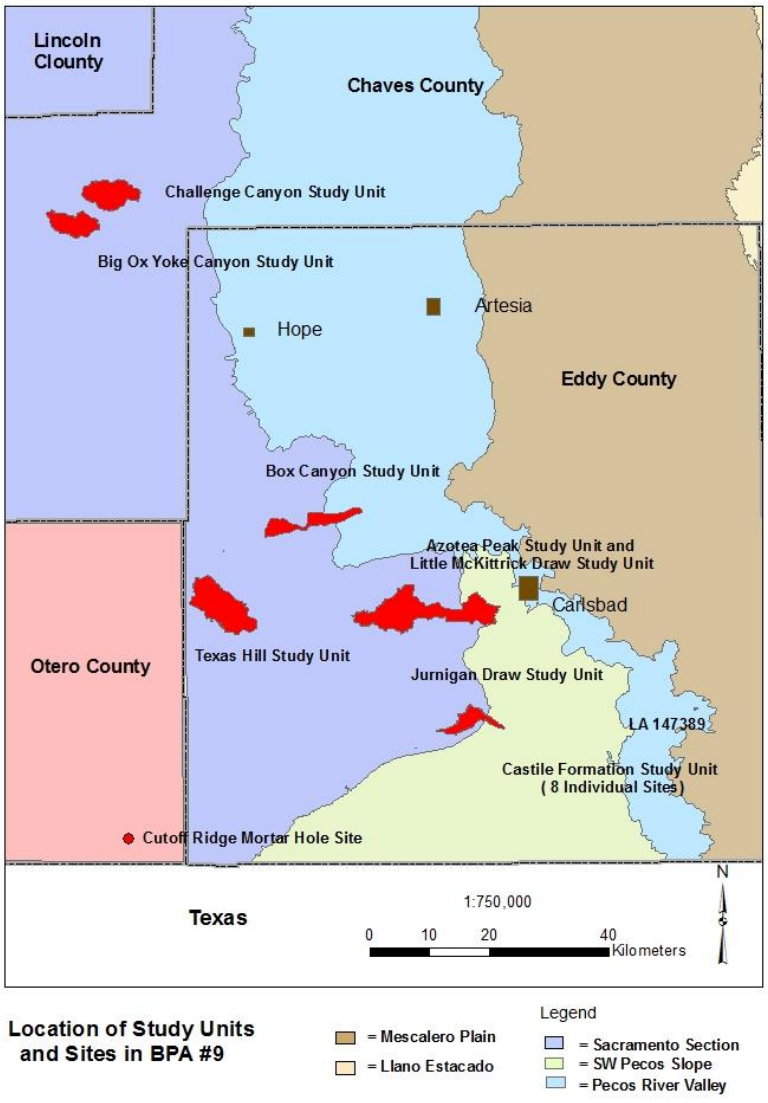
PERMIAN QUARTERLY

Permian Basin Programmatic Agreement Quarterly Newsletter

Volume 6, Number 1, March 2018 - Bureau of Land Management, Carlsbad Field Office
New Mexico



This map shows the locations of study units to be surveyed in a project to record the locations of rock ring midden sites. Read more about the project inside this newsletter.

Introduction to the Permian Basin Programmatic Agreement (PA)

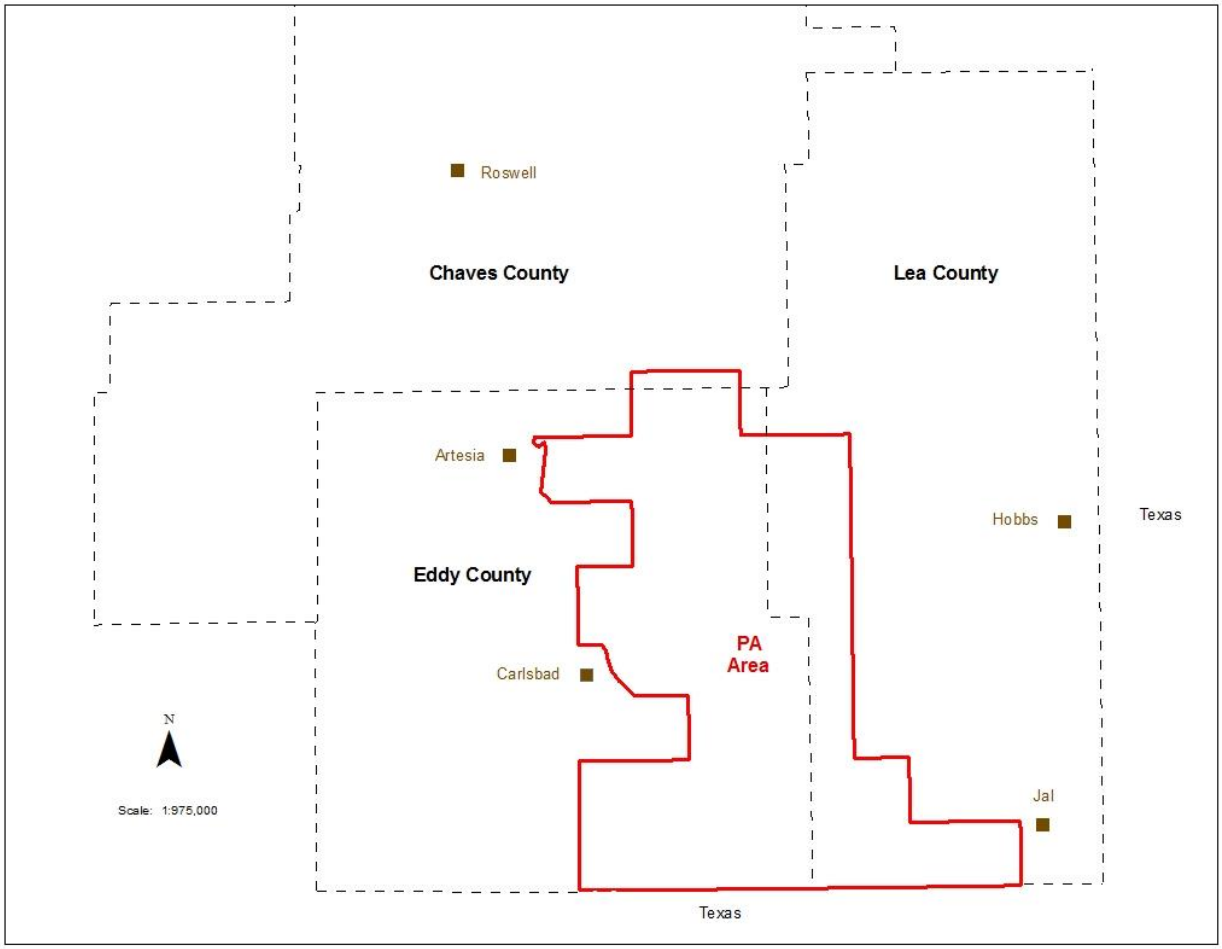


Figure 1. Map showing the Permian Basin PA Area.

The Permian Basin Programmatic Agreement (PA) is an alternate form of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, that is offered to the oil and gas industry, potash mining companies, and for other industrial projects located in southeastern New Mexico. The PA can be used for federal projects located on Bureau of Land Management (BLM) land or BLM sponsored projects located on private property. Originally begun as a Memorandum of Agreement (MOA), it was extended for a period of three years in April 2013 as a Programmatic Agreement (PA) and the PA was further extended for a period of 10 years beginning in May 2016. The PA area is located partially in Chaves, Eddy, and Lea counties. Proponents of projects within the PA area may contribute to a dedicated archeological research fund in lieu of contracting for project specific archeological surveys, provided their proposed projects avoid recorded archeological sites. This dedicated fund is used to study the archeology and history of southeastern New Mexico.

Current PA News

Research Update

A new Statement of Work (SOW) has been prepared for the purpose of obtaining a significant inventory of rock ring midden sites. This inventory will form the basis for additional investigations of these important sites. Ring middens were among the first site types professionally reported from southeastern New Mexico and they have long been interpreted as specialized types of features. Specifically ring middens are created through multiple episodes of plant baking events that are further characterized as communal in nature. Rock ring middens have also been termed "midden circles," "midden rings," "ring middens," "agave roasters," "sotol pits," "burned rock rings," and "annular thermal features" (Wiseman 2010:88). These repeated baking events can span lengthy periods of time, with some rings having a use history of a hundred years or longer, as people returned to the same location and reused the same ring. Ring midden size is the result of repeatedly clearing burned rock fragments from the interior portion of the ring, where the plants are baked, and moving them to the margins of the midden. New rock, fuel, and plants are added to the interior baking area and the process is repeated. Over time this creates a doughnut-shaped mass of burned rock fragments, with a relatively rock free interior "hole" filled with charred material. Artifacts can be found within the burned rock middens, the interior baking locations,

Figure 2. A burned rock ring midden in Eddy County.

and in the general vicinity of the rings. Smaller roasting pits, hearths, and artifact concentrations are sometimes adjacent to the ring middens. One question is whether these smaller features were created and used at the same time as the larger ring middens or if they represent use of the ring locality at a time when

communal baking was not taking place. Several hearths in the vicinity of rings that were excavated at the Brantley Reservoir project were interpreted to be contemporaneous based upon radiocarbon dates (Katz and Katz 1985:104).

Greer (1965) categorized rings into two groups, one with a subsurface pit, termed the mescal or sotol pit, and one group built on the ground surface, termed a midden circle or midden ring. For rock rings in the CFO this difference is not culturally determined, but is a function of the depth of bedrock at a ring midden location. Most of the excavated ring middens in the CFO have no subsurface pit, because they are located on bedrock or in areas with a thin soil. Greer was also the first to draw a clear contrast between the outlying burned-rock midden and the central ash-pit formation. *This realization, subtle as it was, set the stage for a series of more recent archaeological definitions founded in contrasting theoretical perspectives.* (Heilen et at 2015:7).

Figure 3. A burned rock ring midden in Otero County. Most of the rock in this feature Is located on the downslope side of the hill on which it is located.

Katz and Katz (1985:41) provide a good summary of ethnographic descriptions of ring midden use.

> *There are several excellent ethnographic descriptions of ring midden use, all of which describe its function as an oven for baking the crowns of succulent plants, specially the agaves. Agave parryi, A. legchugilla, and A. neomexicana are the dominant agaves of southeastern New Mexico and western Texas; sotol (Dasilyrion leiophyllum), and datil (Yucca baccata) are other common succulents that can be processed in the same manner. These plants can be used interchangeably as available, a practice also described in the ethnographic literature (Bean 1972). In each case, the ring feature is used to bake the crowns of a number of mature plants; leaves and stalks may*

also be baked, but they do not require the use of a large earth and stone oven. The prime season for utilizing the plant is during the late spring or early summer when stalks first appear. It is at this time that the plant has its highest nutritive value as well as being most palatable.

The Mescalero Apache received their name from their affiliation with the procurement and processing of agaves ("mescal") for a basic foodstuff. An historic account of a U.S. raiding party attacking a Mescalero encampment in the southern Guadalupe Mountains reported that 10 tons of agave gathered by the Apache were destroyed in a single episode (Levy 1971:106). Even if the figures are exaggerated, they do indicate the extent to which this plant resource was utilized.

They quote Castetter, Bell, and Grove (1938:29-30) describing the procedures used by the Mescalero and Chiricahua Apache in preparing the plants.

The crowns of the mescal plants were dug out with three-foot sticks cut from oak branches and flattened at the end. This end, when pounded with a rock into the stem of the plant just below the crown, permitted the crown to be removed readily. A broad stone knife was used to chop off the leaves, two being left for tying the crowns together, thus making transportation more convenient. The naked crowns were bulbous, white in color, and from one to two feet in circumference.

Figure 4. Harvesting an agave plant using a stout, trimmed tree limb and a sledgehammer. Note the battered end of the limb.

Pits in which crowns were baked were about ten to twelve feet in diameter and three or four feet deep, lined with large flat rocks. On the largest rock, which was placed in the center, a cross was made with black ashes. Rocks were piled on the flat stones, but care was always taken that the top should be level. Upon this, oak and juniper wood was placed, and before the sun came up was set on fire. By noon the fire had died down, and on these hot stones was laid most grass… bear grass was usually preferred since it did not burn readily …. After the mescal had been covered with the long leaves of bear grass and the whole with earth to a depth sufficient to prevent steam from escaping, the crowns were allowed to bake the rest of the day and all night. Early in the morning the pit was opened and a crown examined and eaten. The pit was again closed and the Indians refrained from drinking until noon of this day to prevent rain. The following morning all the mescal was removed.

The pulpy centers of the black, roasted crowns were released from their charred leaf bases and pounded vigorously into thin sheets on a rock. The brown, juicy pulp was spread out to dry on "mescal cradles," very loosely woven shallow or tray baskets made from the leaves of Yucca elata., and in these the prepared mescal was carried home. Unfermented mescal juice was often sprinkled over mescal when being dried; this gave it a glaze and aided in preserving it. The product might be eaten as soon as baked, or dried and stored for future use in hide containers (parfleches).

The majority of ring midden sites located within the CFO have been recorded during archeological surveys associated with oil and gas exploration and production. Although 71 sites with over 200 ring middens were reported in a 1970 PhD thesis by Applegarth, these sites were apparently never integrated into the Laboratory of Anthropology inventory of sites and, except for a few associated with rockshelters, their locations are currently unknown (Applegarth 1970:36).

Figure 5. Trimming the leaves from an agave crown. The base of the plant is at right.

An aerial survey using the Lidar (Light Detection and Ranging) technique to locate potential rock ring middens was undertaken by SRI, Inc. as a Permian Basin MOA project and reported in *Archaeological Prospection for Ring-Midden Features in Southeastern New Mexico Using Lidar Data: An Experimental Study* (Heilen et al:2015). Three study areas in the foothills of the Guadalupe Mountains and Sacramento Mountains were examined: Azota Mesa, Box Canyon, and the Upper Rio Felix. The Azotea Mesa study area is approximately 54 square miles (140 km square) in extent, while the Box Canyon study area is 64 square miles (166 km square) and the Upper Rio Felix is 254 square miles (658 km square). In total 511 potential ring midden features were identified. 254 of them are located in the Azotea Mesa study area, 155 in the Box Canyon study area, and 102 in the Upper Rio Felix study area. Thirty-three of the potential rings are located within the boundaries of previously recorded sites. This project will field check or "ground truth" all the potential Lidar ring middens that fall within the study units and this will assist in the further use of the Lidar data in other locations.

Figure 6. Agave stockpiled for the Mescal Roast at the Living Desert Zoo and Gardens, Carlsbad, New Mexico.

The majority of the previous ring midden survey and excavations within the CFO have been undertaken in conjunction with Cultural Resource Management (CRM) work for proposed oil and gas exploration and production or other construction projects, notably the construction of Brantley Reservoir and an AT&T fiber optic cable. Archeological research on rock ring middens has been carried out within the CFO for the past 87 years. During that time 31 individual rings and seven multiple rings (overlapping or intersecting) have been tested or excavated. The overwhelming majority of this work has been done in advance of construction projects and most of the testing and excavation was completed primarily to satisfy CRM requirements. In a large measure the result of all of this work is still fragmentary information whether viewed from the perspective of individual sites or considered in a larger locality or regional context. This result has come about due to the nature of CRM work, where construction dictates

the location and scope of archeological research. Contributing factors include the erosion and destruction of archeological features through time resulting in an uneven research potential. For instance, large ring middens at a particular site may still have charred plant remains suitable for radiocarbon dating, while the charred remains in adjacent smaller roasting pits at the same site may be eroded away and the constituent burned rock is dispersed.

Figure 7. Heating the rocks in the pit.

Figure 8. Placing the agave crowns in the pit during the Mescal Roast. (Figure 7 photo by Terry Gregston)

This project is designed to partly remedy this situation by completing 15 m interval transect survey in six study units and completing a TRU demonstration survey within another study unit. These seven units were selected using BLM land ownership, height above sea level, and the topographic variability contained within drainage systems as major selection factors. The inclusion of BLM land was a major consideration, but state and private property is also included in order to encompass portions of the drainage systems. The results of the survey should provide comparable information about a number of attributes useful for interpretation. These include the number and size of ring middens; their associated features and artifacts; the locations of ring middens on the landscape; and the number and kinds of other site types present in the survey areas. The study units are located within the foothills of the Guadalupe and Sacramento Mountains, but comparable information will also be collected from eight outlying ring midden sites in the SW Slopes physiographic region and a possible site adjacent to the Pecos River.

The research questions contained in both the *Permian Basin Research Design 2016-2026* (Railey 2016) and the *Southeastern New Mexico Regional Research Design and Cultural Resource Management Strategy* (SENMRRD) (Hogan 2006) require excavation in order to obtain the data needed to answer most of the questions posed. This SOW does not include excavation, however, the results of the different surveys undertaken can define patterns in the distribution of ring middens on the landscape and comparisons can be made between the different study units that may provide future avenues of research. Katz and Katz have provided a study of landscape and ring midden location, based upon recorded site data:

Katz and Katz (2001) observed that sites in southeastern New Mexico that contain more than one ring midden are more frequent in the desert scrub zone (3,200–3,600 feet [975–1,100 m] AMSL). These sites are often large and commonly include ceramic artifacts and are thought to represent a mixture of processing activities and/or base camps. Sites with single rings are more common in the grassland and lower scrub zones (3,600–5,000 feet [1,100–1,525 m] AMSL). Most of these sites are smaller and less complex than sites with ring middens at lower elevations, typically lacking features of other types and containing primarily lithic artifacts and few ceramic artifacts. Single-ring sites are apparently even more common in the upper scrubland zone (5,000–6,100 feet [1,525–1,860 m] AMSL). Where multiple rings are present in the upper scrubland zone, they have been observed in linear distributions that follow ridgelines. All sites in the upper scrubland zone have debitage but lack ceramic artifacts or features of other types. Katz and Katz (2001) interpreted ring midden sites in the upper scrubland zone as possible staging areas from which hunting and gathering activities were launched while agave was being roasted in the earth oven. In the woodland zone (higher than 6,100 feet [1,860 m] AMSL), the highest-elevation zone in which ring middens have been documented in southeastern New Mexico, ring middens are smaller and rarely have more than a few associated artifacts (Heilen et al 2015:10).

The Heilen et at 2015 study used variables developed for modeling site location in southern New Mexico including sets of variables related to topography, soil attributes, water resources, and vegetation, in order to predict locations favorable for the presence of ring middens.

Figure 9. A load of roasted agave crowns at the Mescal Roast, Living Desert Zoo and Gardens, Carlsbad, New Mexico. (Figure 9 photo by Terry Gregston)

The primary goal of this project is to produce a site inventory based upon boundaries that encompass entire drainages or comparable portions of larger drainage systems within the foothills of the Guadalupe and Sacramento mountains. The distribution of the study units within this region provides an adequate

sample that will be useful for a range of studies that can be undertaken in the years ahead. The results of this survey and analysis will be used as a context statement to design future research projects that are recommended in the *Permian Basin Research Design 2016-2026* (Railey 2016) that will identify the functional, social, and ecological aspects of the creation and use of rock ring middens through time. Secondary goals are to complete a report of the volunteer excavation of a rock ring midden site and to record a mortar hole site in Otero County, in order to produce a guide, "Mortar Hole Recording Standards, Carlsbad Field Office, New Mexico" useful for recording these kinds of sites.

References Cited

Applegarth, Susan M.

1976 Prehistoric Utilization of the Environment of the Eastern Slopes of the Guadalupe Mountains, Southeastern New Mexico. PhD Thesis, University of Wisconsin, Madison.

Castetter, Edward, Willis Bell, and Alvin Grove

1938 The Early Utilization and the Distribution of Agave in the American Southwest. Ethnobiological Studies in the American Southwest. IV, University of New Mexico Bulletin No. 335. Albuquerque.

Greer, John W.

1965 A Typology of Midden Circles and Mescal Pits. Southwestern Lore 31(3).

Heilen, Michael, Monica Murrell, Timothy Mills, Nahide Aydin, Phillip Leckman, and Adam Byrd

2015 Archaeological Prospection for Ring-Midden Features in Southeastern New Mexico Using Lidar Data: An Experimental Study. Statistical Research Incorporated, Albuquerque.

Hogan, Patrick F.

2006 Southeastern New Mexico Regional Research Design and Cultural Resource Management Strategy. Office of Contract Archeology, University of New Mexico, Albuquerque.

Katz, Susana R. and Paul Katz

1985 The Prehistory of the Carlsbad Basin, Southeastern New Mexico. Bureau of Reclamation Southwest Regional Office, Amarillo.

Railey, Jim A.

2016 Permian Basin Research Design 2016 – 2026 (2 Volumes). SWCA, Environmental Consultants, Albuquerque.

Wiseman, Regge N.

2010 Land of the Relentless Sun: An Examination of Prehistoric Site Structure along the Lower South Seven Rivers Drainage, Eddy County, New Mexico. Archaeology Notes 284, Office of Archaeological Studies, Museum of New Mexico, Santa Fe.

The Permian Basin PA is Amended

The Permian Basin PA (formerly a Memorandum of Agreement or MOA) was tailored to oil and gas exploration and production in the Permian Basin of southeastern New Mexico. Although some projects related to potash production have been included, the majority of projects that can be processed under the PA are primarily those related to oil and gas production: well pads, pipelines, power lines, roads, and other infrastructure. Drilling methods have changed in the last several years with the advent of hydraulic fracturing (fracking) and horizontal drilling of wells in large part replacing those vertically drilled wells that were common at the advent of the PA. These changes have introduced new types of facilities to the oil field, specifically frac ponds that are water reservoirs for the fracking operations within a given locality and larger well pads that hold multiple wells for horizontal drilling or for instance, larger collections of tank batteries.

In order to bring the PA up to date the Signatories, consisting of the BLM, the NM State Historic Preservation Officer, and the Advisory Council on Historic Preservation, and the Concurring Parties, consisting of the Mescalero Apache Tribe, the New Mexico Archeological Council, the New Mexico Oil and Gas Association and the Independent Petroleum Association of New Mexico, agreed to make two changes to the agreement. One is a technical change to state that electrical transmission lines of 115kV or larger are not eligible for processing under the PA. The other change has to do with how contributions to the PA are calculated. The original MOA was based upon the types of projects covered by the agreement, for example, an Application for Permit to Drill (APD), a pipeline, an electrical distribution line, etc., but now PA projects are defined upon the footprint of the disturbance and divided into two main categories. "Block project space" is to be used for well pads, frac ponds, drill islands, or other projects that are normally designed using square measurements for their footprints and it is calculated by the size of the project expressed in acres. "Linear project space" is to be used for projects such as pipelines, access roads, flow lines, and others that are normally designed using linear measurements for their footprints and it is calculated by the linear foot. These changes make it easier to apply the PA to current projects, for example, to determine the contribution for a large pad with multiple wells. Calculations using acres means that the disturbance marked in GIS will more closely resemble the actual disturbance on the ground and this will benefit future management decisions based upon GIS information.

Newsletter Contact Information

Questions or comments about this newsletter or the Permian Basin PA may be directed to Martin Stein, Permian Basin PA Coordinator, BLM Las Cruces District Office, 1800 Marquess Street, Las Cruces, New Mexico 88001. Phone: (575) 525-4309; E-mail address: cstein@blm.gov. Unless otherwise attributed all newsletter content was written by Martin Stein.