NPS Form 10-900-b
(Jan 1987)

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United States Department of the Interior
National Park Service

National Register of Historic Places
Multiple Property Documentation Form

This form is for use in documenting multiple property groups relating to one or several historic contexts. See instructions in GUIDELINES FOR COMPLETING NATIONAL REGISTER FORMS (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. For additional space use continuation sheets (form 10-900-a). Type all entries.

A. Name of Multiple Property Listing

Aboriginal Lithic Source Areas in Wyoming

B. Associated Historic Contexts

Lithic Source Analysis
Lithic Technology
Movement, Interaction and Exchange

C. Geographical Data

State of Wyoming

__ See continuation sheet

D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR Part 60 and the Secretary of the Interior's Standards for Planning and Evaluation.

Signature of certifying official — Date: 1-13-89

STATE HISTORIC PRESERVATION OFFICER
State or Federal agency and bureau

I, hereby, certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Signature of the Keeper of the National Register — Date: 9/4/89

E. Statement of Historic Contexts

Discuss each historic context listed in Section B.

The primary and ubiquitous source of information on prehistoric cultures in western North America is chipped stone. Many sites contain other kinds of information, but almost all prehistoric sites in this region are dominated by stone implements and debitage. In the Middle Rocky Mountains, and in many other regions of the West, the most common site type is the lithic scatter, which consists almost entirely of chipped stone. An important source of comparative information for the evaluation and understanding of stone implements and their manufacture is data from the procurement areas of the basic raw materials. These procurement areas range from quarries or quarry complexes, in which bedrock sources were literally quarried, to expedient procurement areas, utilizing redeposited or residual blocks, boulders, nodules or gravels. Another important property type directly associated with these lithic procurement areas is the workshop, where the lithic materials were reduced to desirable forms for transport elsewhere, or utilized to manufacture implements or objects of other materials such as wood, bone or antler. The intent of this multiple property listing is to recognize and encompass major and distinctive lithic source areas in Wyoming, as well as source areas representative of more ubiquitous or mundane lithic raw material types.

Background

From the earliest documented Paleoindian sites in North America, our image and understanding of prehistoric cultures is dominated by their lithic artifacts. Joukowsky (1980:311-312), in her basic handbook of field archaeology, points out that this is true of Paleolithic sites throughout the world. Most of the diagnostic artifacts which are used to mark the temporal divisions of local and regional cultural chronologies are distinctive stone tools, most often projectile points. "Because they survive where less durable items do not, and also because among stone age peoples they constitute an integral part of the adaptive mechanism, chipped stone tools are one of the most important classes of evidence by which we may view the record of human evolution" (Collins 1975:15). In many open sites, stone may be the only material preserved. Thus, stone can be our primary source of information on prehistoric populations. The recognition and investigation of major lithic source areas can provide information on adaptation in the form and utilization of tools, and transportation of materials away from their sources. As Ahler (1986:17) pointed out in his Knife River Flint study, the logical beginning point for investigation of exchange systems and movements should be quarry and workshop areas.

The vast majority of archaeological reports to date do little with lithic source identification beyond acknowledging apparent or probable sources. A good example of what can be done is the Vore Site report (Reher and Frison 1980:121-135, 142-143). In this report, subjective source identification was used to generate several factors for statistical analysis, including minimum number of quarries (MNQ), distance to source (MI) and source diversity (H). Using the three dominant material types and several less abundant material types, trends were noted, including changes in direction of 'movement' and degree of dispersion over time. It was argued that exclusive control over specific lithic sources and formalized trade of valued raw materials were relatively unimportant in the adaptive setting of the Plains (Reher and Frison 1980:121, 123). A later comparative analysis by Craig (1983) expands the range of potential interpretations presented. A major impediment to these kinds of analyses is the current lack of systematic investigation and descriptions of potential source areas, including geochemical characteristics.

X See continuation sheet

Historic Contexts, continued

Major and minor lithic sources are virtually ubiquitous in the State of Wyoming. Major geological contexts of these lithic raw materials include the following: 1) various Mississippian aged formations, such as Madison and Guernsey, which yield cherts; 2) Permian and Pennsylvanian age formations, particularly the Phosphoria or Goose Egg Formation of Permian age, and the Minnelusa, Casper and Hartville Formations of Permo-Pennsylvanian age, which yield cherts; 3) the upper Jurassic Morrison Formation, which yields a variety of cherts and quartzites (however, the so-called Morrison quartzite appears to be a silicified shale which may also derive from the overlying Cloverly Formation (Julie Francis, personal communication)); 4) the lower Cretaceous Cloverly Formation, particularly the Dakota and Fall River sandstones, which yield quartzites (one of the best known of these is Spanish Diggings quartzite); 5) the Paleocene Fort Union Formation and Eocene Wasatch Formation which outcrop extensively in the Powder River Basin, and yield porcellanite, non-volcanic glass and petrified wood; 6) Eocene age formations in southern Wyoming, such as the Bridger, Washakie, Wasatch and Green River Formations, which yield various bioclastic cherts (eg. Granger Green/Church Buttes chert, tiger chert); 7) Quaternary deposits, particularly gravels, which are sources of redeposited boulders and cobbles derived from earlier geological formations; and 8) volcanic deposits particularly in the Yellowstone region, which yield obsidian, ignimbrite and rhyolite. In many locations, the bedrock formations are heavily weathered, and siliceous materials occur as lag gravels or nodules in a residual soil matrix.

Cultural Context

The known cultural chronology of Wyoming spans nearly 12,000 years, and is defined primarily in terms of distinctive stone tool types produced and utilized during each cultural period. Major and localized lithic source areas were utilized throughout these periods and valued lithic raw materials may have been exchanged over long distances. Changes and continuities in lithic raw material procurement and utilization through these periods is as yet poorly studied, but constitutes an extremely important aspect of prehistoric cultural adaptations. Much of our understanding of prehistoric lifeways and past environmental changes must be derived from an understanding of lithic procurement and technology, or lithic chronologies.

The basic cultural chronology of Wyoming and the Northwest Plains is outlined and discussed by Frison (1978). There are seven major cultural periods, each of which can be further subdivided. These periods are: 1) Paleoindian (ca. 11,500 - 8,000 years ago); 2) Early Plains Archaic (ca. 8,000 - 5,000 years ago); 3) Middle Plains Archaic (ca. 5,000 - 2,500 years ago); 4) Late Plains Archaic (ca. 2,500 - 1,500 years ago); 5) Late Prehistoric (ca. 1,500 - 450 years ago); 6) Protohistoric (ca. 450- 150 years ago); and 7) Historic or Recent (ca. 150 years ago to present). Transition

from one cultural period to the next is virtually never sudden nor discrete, and radiocarbon ages for diagnostic manifestations of these respective periods overlap. In addition, there is scattered, suggestive evidence that a pre-Clovis or pre-Paleoindian Period can be added to this scheme. Debates concerning the pre-Paleoindian occupations in Wyoming and neighboring regions center, as yet, on dubious associations of cultural materials in Late Pleistocene contexts, and green bone fractures on Pleistocene faunal elements.

The Paleoindian Period of the Northwest Plains is popularly known for big-game kill sites and large, elaborately worked projectile points. The best-known assemblages of this period are the Clovis and Folsom Complexes. In some broader chronological schemes, Clovis and Folsom and related lithic complexes are grouped as the Fluted Point Horizon. Clovis points, and their variants, from secure context in the western states, are often associated with the remains of late Pleistocene mammoth. Later Goshen and Folsom fluted points are generally associated with Late Pleistocene to early Holocene bison. Later complexes, such as Agate Basin, Hell Gap, Alberta, and Cody lack the distinctive fluting on the points, but are still characterized by large finely worked points. The later phases of the Paleoindian Period are marked by a variety of lanceolate point types characterized by parallel oblique flaking. Other distinctive stone tool types are also associated with many of these complexes.

The Early Plains Archaic Period is reasonably well represented in Wyoming and poorly documented on the open Plains to the east. The beginning of the period is marked by the appearance of distinctive side notched projectile points. Later, projectile point styles are widely varied, and many are similar to later Late Plains Archaic types. In the past five years, many Early Plains Archaic housepit features have been identified in Wyoming. The association of lithic materials with habitation structures can provide important information to increase our understanding of this early cultural period.

The Middle Plains Archaic Period is marked by the appearance of the McKean Complex and, later, several other point types. Archaeological evidence for this period is more abundant and widespread than for the earlier periods, and there is an increase in the presence of grinding implements and stone circles. Another frequently associated feature is the roasting pit. A significant proportion of the housepit structures investigated in recent years have yielded Middle Plains Archaic dates, and may represent a significant aspect of Middle Archaic adaptations.

Late Plains Archaic is first marked by a distinct triangular, corner notched point known as Pelican Lake. Later, several other corner notched point forms and the large, side notched Besant point type appear. Other artifacts and patterns of the Late Plains Archaic Period are largely continuations of the Middle Plains Archaic.

The appearance of the Late Prehistoric Period is marked by a proliferation of small side notched or corner notched projectile points, many of which have serrated edges. This change in point types has been interpreted as reflecting the widespread adoption of the bow and arrow. Later in this

period, side notched, base notched (or tri notched) point forms and pottery appear. Several intrusive cultural traditions are represented by these artifact types. The majority of stone circle sites reported in Wyoming are interpreted as dating from this time period, although these features frequently occur without temporal diagnostics. A number of recent investigations in the Wyoming Basins have reported housepits dating to this period. This would parallel the persistence of this habitation form into the Late Prehistoric and early historic periods of the Columbia-Frazer Plateau and the interior basins of California. Reported Late Prehistoric housepits tend to be smaller and simpler than the known Archaic housepits, but the sample is as yet small and inconclusive.

The Protohistoric Period is marked by the appearance of Euroamerican items and influences. Generally, the earliest identifiable items to appear were trade beads, other small decorative items, and metal knives and arrow points. The effects of early indirect contact on remote Native American cultures were subtle and limited in scope. Limited numbers of small novelty items probably circulated hand to hand, and stories were undoubtedly exchanged of strange people and events in distant places. By the advent of the early Historic Period, the introduction of horses, guns, the fur economy and epidemic diseases, to name a few major items, had drastically altered Native American cultures. Later, large-scale intrusions of Euroamericans led, eventually, to the end of traditional Native American cultures.

This brief outline of cultural chronology has emphasized stone tools, particularly projectile points, as diagnostic temporal markers. Important aspects of the study of these stone tools are the identification of source locations, the physical characteristics of the raw materials, and the technologies utilized to produce implements from these raw materials. Much of this important information must be obtained from the quarry areas where these materials were initially procured and reduced to manageable or desirable forms and proportions. Major lithic source areas were probably used in all periods of the cultural chronology, while smaller, localized source areas may have only been utilized occasionally. Primary and secondary quarry areas frequently exhibit discrete activity clusters, many of which may be temporally discrete. Detailed studies of these lithic reduction areas may provide us with important information on changes in lithic technology and the procurement of lithic raw materials through time.

Lithic Source Analysis

Lithic source analysis is the investigation and evaluation of the sources and characteristics of lithic raw materials. This includes the geological context and physical characteristics of the lithic materials, as well as experimental replication of their stress, fracture and wear patterns. A key source of information on lithic raw materials is their primary source areas, or the locations where the basic material was obtained for later tool manufacture. Quarry sites or complexes, whether primary bedrock quarries or

secondary procurement loci utilizing redeposited blocks, boulders, or gravels, contain specimens of the unmodified source material, evidence of the methods used to remove or recover the preferred material, and workshop areas demonstrating reduction and manufacture technologies. Several different classes of information can be obtained from these quarry and reduction areas, which contribute to our understanding of prehistoric cultures.

A commonly recognized aspect of lithic source analysis is the identification and definition of discrete or distinctive lithic sources. This identification may involve the association of a distinctive material type with widely occurring outcrops of a particular geologic formation, or may involve the discrete identification of a particular source area by petrographic and trace element analysis. In either case, known source locations are compared to the spatial distribution of characteristic raw materials in archaeological sites. Commonly observed patterns are that abundant but low quality materials tend not to occur far from their sources, while scarce and high quality materials may be found in distant contexts. It has also been noted that as distance increases from a high quality raw material source, that raw material is more likely to be found in elaborately or carefully worked forms or in contexts indicative of status distinctions. In addition, Gramly (1980) has noted a high likelihood, in some contexts, of the occurrence of high quality, curated materials at other source areas. Many kinds of interpretation, from simple to sophisticated, are not possible if the probable sources of the raw material cannot be identified.

Lithic sources are a key aspect of settlement subsistence systems, but are often neglected in favor of habitation sites. Ericson (1984:1) has stressed the quarry site as the most important component of lithic production, and noted that these sites are neglected due to the sheer volume and unattractive nature of the data which they contain. Along the same lines, Gramly (1980:5) stresses that the sampling of quarry and workshop areas, in order to yield useful information, requires extensive excavations and intensive investment of effort. It remains a tradition of the discipline that distinctive, high quality lithic materials in archaeological sites can often be identified to discrete sources, and that the experienced eye is a critical tool in this identification (Reher and Frison 1980:121-122). This might require the expertise of a geologist, rather than an archaeologist (cf. Vehik 1985:265), but expensive, sophisticated and quantifiable techniques have so far proved to merely confirm visual identification, and lack cost effectiveness.

Purdy (1984) has noted that quarry analysis does not merely provide raw source data for the interpretation of other sites, but can yield important information by itself. In spite of deficiencies in clear stratigraphy, diagnostic artifacts and conventionally datable materials, Purdy has demonstrated that meaningful components can be distinguished and analyzed. Ahler and Vannest (1985) have also shown that some quarry and workshop complexes can yield distinguishable components using conventional research methods. Superficially, it often appears that quarries and workshops are overwhelming

masses of mixed and overlapping activities. Secondary procurement sources in particular may be made up of numerous, small, unrelated and overlapping activity areas accumulated over long periods of time. Nonetheless, a significant proportion of quarry areas show discrete surface distributions of materials with temporally distinguishable activity areas, and have quarry complexes and workshops which have, perhaps subtle, but distinguishable stratigraphy. Major bedrock quarry areas, such as Spanish Diggings and the Knife River Flint quarries, contain large quarry pit and workshop complexes that involved periodic massive group efforts (Reher nd). The necessary removal of overburden to reach fresh raw material has generated the mixed blessings of buried levels and vast quantities of debris which must be removed to reveal the stratigraphy.

Another aspect of lithic source analysis is the description of the range of variation in appearance and physical characteristics of a particular range of materials from a given source. The goal of this effort is the definition of source types and their identification with specific source locations, or likely source contexts. This provides comparative information for investigators attempting to identify the probable source of materials which they have recovered from archaeological sites. This kind of investigation and analysis necessarily involves working with materials from quarry areas.

Lithic source description is potentially rewarding, but fraught with difficulties of unstandardized terminology among archaeologists and geologists alike. Common and folk terms for lithic materials often use the names of 'type' localities and geological formations which may be misleading. Inexperienced field investigators may think of a type locality as the sole source of a material, or be unaware of the full range of potential sources. It cannot be assumed that distinctive materials are derived from larger distant sources when smaller or less well known local sources are available. For example, specimens of dendritic chert might be identified as 'Spanish Diggings', implying a source in the Hartville Uplift, when, in fact, they are from the Madison Formation in the Wind River Mountains. Another common misnomer in the Northwest Plains is Morrison Quartzite, mentioned above, which is a silicified sediment, sometimes grading into quartzite, and is not always derived from the Morrison Formation. It remains necessary to preserve and investigate the quarries themselves, and make them accessible to investigators. For example, Saul (1964:185) noted that 'Spanish Diggings' (probably Guernsey Formation) cherts properly included varieties of agate, chalcedony, jasper, true flint and cherty limestone, but were best referred to by the general term chert. Ives (1984; 1985) has pointed out that inconsistent use of terminology is compounded by the use of terms without clarification or presentation of criteria. In other words, it is bad enough that 'experts' and investigators use terms differently, but if they would define their terms some of the discrepancies could be resolved. In addition, geological descriptions of bedrock formations use a profusion of local names which may be applied to similar aged or physically related formations. Often professional geologists are unable to use the descriptions of geological

formations, and it is small wonder that this confusion extends into the archaeological literature.

Even with difficulties of terminology resolved, a lithic source or a formation which potentially yields quality chippable stone materials, cannot simply be characterized by type specimens or type localities. Ranges of variation in qualities and descriptive properties must be balanced with similarities or overlap with other sources. Sometimes, materials might only be assignable to a geological formation, rather than a specific source location, or placed in a descriptive category without a known or specific source. Investigation of known sources needs to include comprehensive investigation and sampling of ranges in variation in physical properties, descriptive attributes and aspects of accessibility. It is therefore inadequate to set aside a few spectacular or type localities, unless it can be demonstrated that these examples truly represent the variability of the source area.

Lithic Technology

The study of lithic technology involves the investigation by direct analysis and replicative experiments of techniques of production and use of stone tools. Among the types of analysis are: use wear and fracture patterns of individual tools; experimental replication of tool types, fracture patterns or use wear patterns, using samples of identical materials; and mapping lithic debris and reconstructing cores or nodules from the lithic debris, to reconstruct technological and behavioral patterns. All these types of analysis benefit at some level from the use of lithic materials from quarry areas or workshops. Reconstruction of cobbles and nodules is frequently dependent on a access to primary reduction and manufacture workshops.

Lithic reduction as a process begins at the source area, but may be dispersed across broad expanses of landscape as cores, blanks or other 'curated' items were further reduced for maintenance or specific tasks. Mapping and reconstruction of this reduction sequence clearly requires access to the primary source area, nearby workshops, and the more distant sites where the materials were further reduced. Experimental replication also requires access to the primary source of the raw material to investigate its properties. Use wear analysis can work primarily with the recovered artifacts, but is more useful and meaningful if it is enhanced by experimental replication. Thus, "A better understanding of western Plains lithic technology requires an understanding of the large quarries where the regional mechanics of procurement and utilization were initiated." (Reher nd:2). It also must be recognized that most sites involve the procurement of a variety of raw materials, with differing desired properties, from different source localities (cf. Findlow and Bolognese 1984).

It is usually assumed that the procurement of lithic resources, as a necessary raw material, whether for sheer survival or also involving ritual or aesthetic properties, must be scheduled with the procurement of other

resources. It is also frequently assumed that subsistence resources and minimization of "cost" will take priority. However, this last assumption is not well demonstrated for hunter-gatherer societies. Nonetheless, seasonal differences in resource accessibility, direction of movement and patterns of amalgamation and dispersion are likely to be reflected in the proportions of raw material types found in archaeological sites. Another common assumption, which appears to be well demonstrated, is that specific raw materials are often preferred for specific classes of tools. Thus, some raw materials may be found far from their potential sources because equivalent materials are not available locally.

The investigation of lithic technology involves the classification of artifacts, debitage and debris into functional and formal categories, which can subsequently be compared and evaluated. Comparative analysis involves comparison of the proportions of elements or classes represented in the artifact and debitage aggregates among sites or site types. Several good studies (eg. Frison and Bradley 1980; Ahler and Vannest 1985) have demonstrated the potential of such analysis of quarry locations and outlying activity areas. Differences in the proportions of material types and classes of artifacts and debitage in the lithic aggregate demonstrate important differences in lithic technology and adaptive strategies. Gramly (1980) has pointed out that sometimes, movement of raw materials is not necessarily away from raw material sources, but that expended tools may be found at the locations in which they were replaced.

A lithic source area, beyond being the source of potentially identifiable materials, can reflect key elements of lithic technology in several ways. Of primary importance is that the patterns of use and discard at quarries and workshops reflect raw material preference and key aspects of production sequences. Three fundamentally different patterns are commonly observed in the interpretation of quarry and workshop debris: 1) lithic debris is dominated by all stages of reduction flakes, few cores and some broken bifaces, reflecting the production and removal of cores and bifacial blanks; 2) the lithic debris is dominated by cores and initial reduction debris, indicating an emphasis on the production of flakes for off-site modification; or 3) lithic debris is characterized by a mixture of cores, reduction debris and utilized flakes or secondary tools, reflecting an on-site industry with end products other than stone tools. Many factors may enter into the exploitation of a lithic source area and its relation to overall subsistence patterns, and these factors will be reflected in the way in which raw materials are utilized and transported.

A chronic problem in the study of lithic technology, as with descriptions of lithic raw materials, is the lack of standardization in terminology. There are a number of schools of thought in the classification of the products of lithic processing, and a number of admirable schemes have been offered for the objective classification of lithic materials. However, it often remains impossible to compare the descriptions of lithic inventories among sites. "Classic" descriptive analysis often deals with an ideal core reduction

sequence. It is assumed or visualized that lithic materials were reduced to a portable form at the source area to be transported elsewhere for use or modification. At times secondary tools may have been produced and used at the source area for the modification of another material, such as wood. First, simple primary or cortical flakes were removed, often by direct percussion, to remove the hydrated, lower quality exterior cortex from a rough chunk or nodule of raw material. If found unsatisfactory, a "tested" nodule may have been rejected at this stage. The cortical flakes which were removed are characterized by minimal modification (criteria vary somewhat) of the dorsal surface, and although these flakes were sometimes utilized in an expedient form, they tend not to be modified further into specific tool forms. The sequence of flakes removed subsequent to these cortical flakes, which have both traces of cortex and previous flake scars on their dorsal surfaces, are generally referred to as secondary flakes. Again, specific criteria vary among investigators. Smaller interior flakes, depending on various criteria are referred to by such terms as tertiary flake, biface reduction flake or retouch flake. The particular terminology depends on the ideal reduction sequence and a variety of objective or subjective criteria. Regardless of what preferred terminology is used, a significant proportion of the preferred toolstone from a lithic source area was removed at incomplete stages of manufacture for modification and use at other localities. The transported forms may have been partially modified flakes, prepared cores, crude bifaces, blanks, preforms, or "final" bifaces. Such patterns would have depended on a number of cultural perceptions and patterns, including perceived desirability and availability of the raw material, distribution relative to other resources, and intended use. Investigations at source areas are important to understanding such patterns of lithic technology.

A prominent issue in archaeological theory is the relationship between expedient and curated technologies, and how the organization of technology might relate to foraging and collecting strategies in the larger subsistence and settlement systems. At the simplest level, it is postulated or assumed that simple foraging strategies will tend to be associated with an opportunistic use of raw materials aimed at producing minimally patterned, expedient tools. Such an idealized strategy would depend on the widespread availability of adequate raw materials. At the opposite extreme, logistically organized collecting strategies are assumed to be associated with the planned procurement of superior raw material for the production of specific toolkits and patterned tools. The utility and reality of these associations should be seriously investigated, rather than assumed, and quarry and workshop sites embody important aspects and stages of these lithic technologies.

Movement, Interaction and Exchange

Another context in which lithic source areas and workshops are significant is in the understanding of spatial movements, group to group interactions, and the exchange of resources. "The identities of raw materials

have always interested archaeologists, and attribution of artifacts to specific sources has been a central concern in discussing exchange networks and population movements" (Gramly 1980:823). A key aspect of this kind of investigation is the recognition of distinctive materials from discrete source areas and their distribution among sites over the landscape. The relative proportions of certain materials in an archaeological site will tend to reflect the function of the item, the perceived value of the item or material, relative distance to the nearest potential source, tasks undertaken at the site, and previous movements or interactions of the group which utilized the site locations. The distinction between the movement of people and the movement of materials in a largely nomadic society can be complicated. However, with increased emphasis in recent years on cultural systems and processes, it has become increasingly evident that quarry and workshop sites are critical to understanding social interaction patterns over extensive geographic areas (Ahler 1986:16).

In view of the above considerations, lithic source areas cannot be treated in isolation. They are part of larger patterns of adaptation and movement. Lithic procurement and processing did not take place in cultural isolation. The primary activities at a particular site may have been lithic extraction and processing by a logistic task group with subsistence activities merely supporting these activities. Other localities may have been chosen for preferred game, plant or other resources, and involved incidental or expedient extraction and processing of available lithic resources. Much remains to be learned about the complex of activities within a given site or activity locus and the place of such a site within a dynamic cultural system. Even for the evaluation of the quarry itself as a locus of resource extraction, information contained in nearby workshops and habitation sites is critical. It should be possible at the quarries and workshops, to determine technological and cultural changes in material preference, tool assemblages and dominant techniques through time. This information might then be useful in the investigation and evaluation of surface or shallowly buried lithic sites which contain no conventional diagnostic or chronometric materials. In the words of Butler and May (1984:xviii) in the preface to the First Conference on Chert Exploitation:

> *Once a chert* [or any other major lithic material] *can be reliably identified as to its geological and/or geographical origin, the character of its use in the technological system and its transport over the landscape provides useful information not only on basic subsistence-settlement adaptation but also on resource utilization patterns, ranges of movement, and social interaction and exchange. In a diachronic perspective, such data allow us to examine changing adaptations as reflected in technology and resource utilization, as well as aspects of social organization and interaction.*

F. Associated Property Types

I. Name of Property Type: Quarry

II. Description

Quarries are areas in which lithic materials have been removed or reduced for modification or use. The nature of the quarry depends on the character of the raw material and its matrix, and the perceived value of the raw material. Procurement strategies may involve: excavation of pits, trenches or shafts; removal of matrix from exposed bedrock along bluffs, ledges, or talus blocks; expedient utilization of surface cobbles or boulders; or a combination of these strategies. Any discrete occurrence or manifestation of these strategies is a quarry. Shafts and galleries are undocumented as quarry features in Wyoming, although it has been speculated that they may exist beneath the quarry debris in some portions of Spanish Diggings. Almost all quarry features are, quarry pits, nodules excavated from residual mantle, quarried talus blocks, quarried rock faces, or expedient procurement areas. In addition, all quarry areas contain some workshop activities.

III. Significance

Quarries, particularly those which yield high quality lithic materials, are extremely important in archaeological studies. Archaeologists in the field should be aware of the range of potential lithic sources available to the prehistoric inhabitants of an area, and the geological formations or geographic contexts which yield these materials. It is important for understanding seasonal adaptations, lithic technology, patterns of group movement and regional exchange systems, to know the actual or probable sources of lithic raw materials, and the strategies employed to recover those materials. This information is available only from quarry and workshop areas. The major or distinctive primary quarry areas, as well as representative examples of more widespread sources, should be recognized by enrollment on the National Register of Historic Places.

IV. Registration Requirements

The National Register of Historic Places should include the major or distinctive quarries in Wyoming, as well as representative examples of more common or widely dispersed lithic source areas. To be eligible for enrollment on the National Register of Historic Places a quarry or procurement area should have distinguishable procurement and workshop areas which can yield information on particular lithic raw materials and on the technology of extraction and lithic reduction. This might range from distinct quarry features, such as trenches and quarry pits, to casual procurement areas on cobble-gravel surfaces, associated with chipping station or workshop areas. The lithic raw material yielded by the procurement area should be of a distinctive, identifiable or commonly used lithic material, important to the lithic technology of the area or region. The primary emphasis of the enrollment of lithic source areas on the Register is the preservation of primary data on the raw materials themselves and on aboriginal extraction and reduction technologies. Therefore, any quarry or procurement area which retains integrity of extraction and reduction areas has the potential to yield important information. However, preference should be given to those areas which have a discrete or several distinguishable components which have the potential to yield information for diachronic comparisons.

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_X_ See continuation sheet for additional property types

G. Summary of Identification and Evaluation Methods

Discuss the methods used in developing the multiple property listing.

Compilation of this lithic source area multiple property is based on the compilation of the Black Mountain Archaeological District nomination (which includes a Bighorn Phosphoria chert quarry complex) and consideration of available materials on several quarry areas in the Hartville Uplift, Old Woman Anticline area, which were under consideration for nomination. After extensive research into available reports on lithic source areas in eastern Wyoming, and into theoretical syntheses on lithic source analysis and lithic technology, it was decided that it would be productive to develop a multiple property context to encompass a range of potentially eligible properties in Wyoming. In this way background information on the context and basic justification of significance could be compiled in the multiple property documentation form, rather than repeated in each individual nomination of a quarry site, quarry district or procurement area. Several informal discussions were held with Dr. Julie Francis of the Office of the Wyoming State Archeologist and Dr. Charles Reher of the Department of Anthropology, University of Wyoming, both of whom have worked extensively with Wyoming lithic source areas, to develop the basic idea of this context. Background information in the narrative text is based heavily on a knowledge of lithic sources in the eastern and northern portions of the state, but is intended to allow for the inclusion of properties from other areas of the state.

__ See continuation sheet

H. Major Bibliographical References

Ahler, Stanley A.

1986 The Knife River Flint Quarries: Excavations at Site 32DU508. Bismarck: State Historical Society of North Dakota.

Ahler, Stanley A. and Julieann Vannest

1985 Temporal Change in Knife River Flint Reduction Strategies. In, Lithic Resource Procurement: Proceedings from the Second Conference on Prehistoric Chert Exploitation, Center for Archaeological Investigations, Occasional Paper No. 4, edited by Susan C. Vehik. Carbondale: Southern Illinois University.

X See continuation sheet

Primary location of additional documentation:

X State Historic Preservation Office
__ other State agency
__ Federal agency
__ local government
__ University
__ other

Specify repository: SHPO Cultural Records, Laramie

I. Form Prepared By

name/title: Carl Späth, Ph.D., Wyoming National Register Archaeologist
organization: State Historic Preservation Office Date: 16 June 1989
street & number: University Station, Box 3431 telephone: (307) 766 5323
city or town: Laramie state: Wyoming zip code: 82071

Property Types, continued

I. Name of Property Type: Lithic Workshop

II. Description:

Lithic workshops are complexes of lithic reduction or manufacture areas which are associated with, and not uncommonly adjacent to, quarry features or casual procurement areas. Frequently, these lithic workshop areas show little or no evidence of habitation or ancillary activities. Exceptions occur in the major quarry complexes at Spanish Diggings where many stone circle sites are located atop or within workshop areas. Workshop areas are composed of spatially discrete, overlapping or superimposed activity areas, representing temporally or technologically distinct reduction and manufacture episodes. At extensively utilized quarry areas, particularly if the desirable properties of the raw material deteriorate after exposure to the air, massive quantities of debris may be accumulated on the surface and in abandoned quarry features. In these cases, there is likely to be discernible stratigraphy in many of the workshop and quarry areas. Workshop areas may be definable as sites discrete from the quarries per se, but will not occur as sites isolated from the quarry complex or district.

III. Significance:

Lithic workshops, whether spatially coincident with quarry and procurement activities, or somewhat removed, represent areas of preparation or use of the recovered raw material. Therefore, the significance of workshop areas lies in the strategies of reduction or manufacture which are represented in the activity areas. At a basic level, the raw material may be: 1) reduced to portions and forms desirable for the manufacture of finished tools at another location (eg. cores, blanks or preforms); 2) reduced to the final forms on the spot, with the possibility that earlier tools will then be discarded; or 3) used to make 'expedient' or secondary tools, which are then used to modify other kinds of raw material, such as wood or bone. In all cases, the tools, tool fragments and lithic debris at a lithic workshop have the potential to yield important information on the selection, reduction and uses of lithic raw material. Changes and continuities in aboriginal technologies over time can yield important information on the material cultures and adaptive strategies of aboriginal groups in different chronological periods. The workshop is an important functional element of the quarry complex, and should not be excluded.

IV. Registration Requirements:

In order to constitute contributing properties or elements for the enrollment of a quarry complex, quarry district or lithic procurement site, lithic workshops should retain integrity of setting and content and be associated with the quarry or procurement areas. A workshop by itself may

also have the potential to yield information important in prehistory. The workshop is eligible as an entity for enrollment on the Register if it can yield significant information on lithic technology without information from a directly related raw material source. Attributes which would contribute to the significance of a lithic workshop are: 1) discrete activity areas which demonstrate important aspects of lithic technology or reduction strategies; 2) distinguishable components which can yield information on diachronic trends in lithic technology; or 3) represents particular strategies of selection, technologies of manufacture or patterns of use of one or more raw materials.

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