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BACKGROUND TO THE HISTORIC AND PREHISTORIC RESOURCES OF EASTERN KENTUCKY

by

Chuck M. Niquette
and
A. Gwynn Henderson

WITH A CONTRIBUTION BY Ellen A. Dugan

CULTURAL RESOURCE SERIES NO. 1

Tablet drawings by Shelly H. Fischman. These motifs are from a clay tablet (cover) and a stone tablet (title page) recovered from the Gaitskill Site, Montgomery County, Kentucky. Taken from Webb, W.S. and R.S. Baby The Adena People No. 2 (1975).

Copies of this report may be obtained from the Bureau of Land Management, Eastern States Office, 350 South Pickett Street, Alexandria, Virginia 22304.
Order No. BLM-YA-PT-84-009-4331

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Prepared by Environment Consultants, Inc. for the United States Department of the Interior, Bureau of Land Management Under contract AA 851-CT1-71: Cultural Resource Class I Inventory Study for a 35-County Area in Eastern Kentucky

Richard Brook
General Editor
1984

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Site 15 JO2 prior to excavation (photograph courtesy of the Museum of Anthropology, University of Kentucky)

FORWARD

The Bureau of Land Management's Eastern States Office (BLM/ESO) is a relatively unknown federal agency in the eastern half of the nation. The relative obscurity of ESO is largely attributable to the concentration of public lands in the Far West managed by BLM and the scarcity of such lands within the 31 states bordering and east of the Mississippi River. Within this 31 state area of ESO's jurisdiction, no more than 60,000 acres remain as federally-owned public domain. In marked contrast to the relative paucity of BLM surface-administered lands in the east are the estimated 25 million subsurface acres on which ESO controls developable mineral rights. This Federal Mineral Ownership--FMO--is located beneath lands managed by other Federal and State agencies or owned privately and is termed split-estate. Leasing of the various minerals, predominately coal and oil and gas, is the ESO's primary mission.

While mineral leasing is the primary mission, ESO also must ensure that other important resource values such as cultural resources are protected. The Background to Historic and Prehistoric Resources of Eastern Kentucky provides an overview of eastern Kentucky, where ESO manages approximately 150,000 acres of FMO. The primary objectives of the study were to compile existing information on historic and prehistoric resources in a 35-county area and to characterize the nature, number and distribution of known cultural properties located on the discontiguous parcels of FMO in eastern Kentucky. Studies such as this provide federal managers with the information base needed to make sound decisions on long-term planning and management that include protection for cultural resources.

Newt Kash Rockshelter during Work Projects Administration excavations (photograph courtesy of the Museum of Anthropology, University of Kentucky)

The current study points out that although a long sequence of prehistoric and historic occupation is represented in the study area, it is poorly understood. The researchers attribute this to the "fact that information currently available from the region is little more than highly biased inventory data." The lack of previous systematic on-the-ground inventory in eastern Kentucky, of particular concern within the Daniel Boone National Forest, highlights the need for Federal land-managing agencies to cooperate in archaeological projects where their interests overlap. In view of these problems and the overall shrinking cultural resource budgets facing many agencies, the advantages of inter-agency cooperation in this and other areas become more apparent. The researchers identify the benefits of such cooperation in their management recommendations.

This publication represents the first volume in a continuing series of significant cultural resource reports resulting from BLM-sponsored studies in the eastern states. I believe this publication will prove useful and valuable as a document on which to build in archaeology and history in eastern Kentucky.

Richard Brook
General Editor

Lula Auxier Tar Kiln Petroglyph, Paintsville Reservoir, Johnson County, Kentucky (photograph courtesy of the Huntington District Corps of Engineers)

ABSTRACT

This report constitutes one portion of a three part Cultural Resource Class I inventory study of a 35-county area in eastern Kentucky for the Bureau of Land Management, Eastern States Office. This investigation was initiated in order to furnish data pertinent to land use planning on Federal Mineral Ownership (FMO) lands in Kentucky. A Class I inventory study includes an inventory of existing data and a review and compilation of known data from a given region, in this case eastern Kentucky. This document consists of five chapters. These include: 1) a discussion of the past and present environmental setting of the study area; 2) a review of the cultural developments, both prehistoric and historic which have taken place in the study area; 3) a discussion of the existing data with particular emphasis on the biases inherent in these data; 4) a discussion of potential research questions and problem domains for structuring future investigations specific to eastern Kentucky; and 5) management recommendations for the study area's cultural properties. These recommendations provide a framework for assessing the significance of known and yet-to-be discovered archeological and historic properties. Moreover, these recommendations provide a foundation for the development of an effective program designed to identify and manage such properties located on lands containing federally owned minerals in eastern Kentucky.

ACKNOWLEDGEMENTS

The authors owe a debt of gratitude to a number of individuals who have contributed to the present study. Dr. R. Berle Clay, Office of State Archaeology, Lexington, Kentucky was most generous with his time, facilities and valuable information. Without his help the project could not have been completed.

We also appreciate the active cooperation and assistance provided by the following professionals: C. Wesley Cowan, Ohio State University, Columbus, Ohio; Thomas N. Sanders, Charles D. Hockensmith and David Pollack of the Kentucky Heritage Council, Frankfort, Kentucky; Dr. Lathel F. Duffield and Wesley S. Creel of the Museum of Anthropology, University of Kentucky, Lexington,Kentucky; Richard Brook of the Bureau of Land Management, Eastern States Office, Alexandria, Virginia; Richard Boisvert and Malinda Stafford of the Office of State Archaeology, Lexington, Kentucky; Gary Knudsen, Forest Service Archaeologist, Daniel Boone National Forest, Winchester, Kentucky; Don Ball, Staff Archaeologist, Louisville District Corps of Engineers, Louisville, Kentucky; Dr. Jack Schock, Professor, Western Kentucky University, Bowling Green, Kentucky; Philip DiBlasi, University of Louisville Archaeological Survey, Louisville, Kentucky. The figures were drafted by Mary Jo Staggs. The manuscript was processed by Lynn Johnson and Bet Ison, with some assistance from Garland Niquette. The authors greatly appreciate the assistance provided by all.

The Bureau of Land Management (BLM) has a number of mandated responsibilities with regard to archeological and historic properties located on lands under their control or jurisdiction. Among these responsibilities is a requirement to identify, evaluate, and protect significant properties (cultural resources). Moreover, BLM is charged to provide for appropriate public and research use of this resource base and to ensure that agency undertakings or policies do not inadvertently harm or destroy such properties. The resources which are the subject of the following document are not limited to archeological sites but also include all manner of historical and cultural properties due to their ethnic, architectural, historical, artistic, or other contributions to this country's national heritage.

Within the framework of the BLM's mandated responsibilities to cultural resources, this agency's Eastern States Office has contracted with Environment Consultants, Inc., to produce a Class I study of the project area. This volume represents the results of this effort and includes a review and compilation of known data pertinent to cultural resources located on lands on which the Federal government owns the mineral rights. The document contains six chapters including an introduction, a discussion of the effective environment of the project area, an overview of the cultural and chronological developments that have occurred in eastern Kentucky, and three final sections which deal specifically with the data base, considerations for future research, and finally management recommendations. Of particular interest to non-technical agency officials will be Chapters I, IV, and VI. It is recommended that management decision makers read these portions of the report carefully. This three-part Class I study consists of a series of U.S.G.S. topographic maps showing the location of recorded archeological and historic sites located on FMO lands and two reports. In addition to the present volume, there is a second document entitled Known Cultural Resource Site Record Compilation for BLM Federal Mineral Ownership Properties in a 35 County Area of Eastern Kentucky prepared by Charles M. Niquette and Wm. Lane Shields (October 1982). Agency officials are advised to make use of each of these sources since each contains information relevant to planning decisions which may potentially have an adverse impact upon recorded properties located on FMO lands.

The study area encompasses 35 counties in eastern Kentucky which is underlain with discontiguous tracts of Federal mineral ownership (FMO) such as oil and gas, coal and oil shale. These potential lease tracts include

approximately 150,000 acres, of which nearly 62,500 acres are located beneath Daniel Boone National Forest. The remaining acreage is located beneath scattered U.S. Army Corps of Engineers reservoir areas. In 1979, the Department of Interior established a program whereby coal and other mineral reserves owned by the federal government could be offered for development and commercial production through competitive lease. In spite of multiple federal agency surface ownership, the BLM was assigned lead agency responsibility to insure that such leasing and subsequent development was conducted in an environmentally acceptable manner and in accordance with the intent of legislation such as the Antiquities Act of 1906, the Reservior Salvage Act of 1960, as amended, the National Historic Preservation Act of 1966, as amended, the National Environmental Policy Act of 1969, Executive Order 11593 (May 1971), the Federal Land Policy and Management Act of 1976, and the Archaeological Resources Protection Act of 1979.

Eastern Kentucky is located in the Appalachian region of eastern North America. This area contains a variety of environmental zones but is generally forested with oak, oak-hickory, and oak-pine floral communities. The timbered slopes represent second and third-growth forests. The greatest portion of eastern Kentucky is underlain by Lower to Middle Pennsylvanian-age sandstones, although conglomerates and shales also occur. The region is extremely rugged and most modern settlement and transportation routes are located along the narrow river floodplains which drain the region.

The eastern mountains of Kentucky are a cultural region as well as a natural one. Distinctive ideas and traditions characterize its society. Problems of isolation, poverty, education, and health are due in part to the area's rugged terrain. Large areas remain unsettled and population densities remain below the state average. Throughout the 12,500-year period of human occupation in eastern Kentucky, both prehistoric and historic peoples have been greatly influenced by their surrounding environment. Similar to today's inhabitants of this area, prehistoric man was apparently affected by the region's rugged topography which served to isolate regions and restrict mobility.

As noted above, the cultural past of eastern Kentucky extends at least as far back as 12,500 years ago. Although researchers have documented a long sequence of prehistoric and historic cultural developments during this time span, this sequence is only partially understood, and then only in the most general of terms. This ambiguity stems largely from the fact that information currently available from the region is little more than highly biased inventory data. The majority of archeological research in eastern Kentucky has been concentrated in the flood pools of various

reservoir projects and very little is known about the nature, distribution or density of sites located in upland areas. Many of the reservoir projects did not include systematic survey coverage and some of the consequent publications have erroneously reported negative findings. Another contributing factor which has inhibited our understanding of man's past in eastern Kentucky focuses upon adverse environmental conditions which hamper site discovery efforts. These include the rugged, forested terrain which severely restricts land surface visibility as well as alluvial and/or colluvial deposits which are believed to have buried many sites.

The state archeological files contain a decided bias with respect to historic properties. This bias is the result of two factors: 1) historic sites (standing structures as well as ruins) have only recently been recorded by archaeologists conducting surveys, and reported as archeological sites; and 2) the Kentucky Heritage Council maintains a separate inventory of historic standing structures which in the past were not classified as archeological sites. The Heritage Council's inventory has not been incorporated into the Office of State Archeology files, and thus standing structures are underrepresented in the compilation of known sites in the project area. Formal historic archeological investigations that include fully developed research procedures and analytic techniques are rare to non-existent in Kentucky. To date, no such research has been undertaken in the Eastern Mountains region of the Commonwealth.

As noted above, archeological investigations conducted in eastern Kentucky have focused on locating and inventorying sites. Excavation, cultural historical syntheses, and problem-oriented investigations are generally lacking. In order for BLM to develop and implement an effective management program for these resources, it is important that a method for identifying and evaluating sites be developed, as site significance applies to National Register of Historic Places criteria. One approach to assessing site significance lies in the development of a regional research design, however, neither a state historic preservation plan for the region (cf., Clay 1980) nor a regional research design presently exists. Furthermore, although Collins and Brooks (n.d.) called for the formulation of such a regional research design as a result of their study of the eastern coal fields, to date no such research design has been implemented.

Formulation of a regional research design is beyond the scope of this study. However, discussion of important research questions that are particularly applicable to the Eastern Mountains region are included below and these are greatly expanded in Chapter V. It should be noted that it is not possible to include all topics of interest to all

researchers, nor is it possible to adequately anticipate future research orientations and data requirements. This discussion of research questions is intended to simply outline feasible avenues of research for future investigations in eastern Kentucky, as an aid for BLM in formulating a method for assessing site significance for sites within its jurisdiction.

Research priorities for eastern Kentucky should aim to meet three major goals: outlining the region's cultural historical developments, reconstructing past lifeways, and explaining cultural processes (Thomas 1979). In order for these goals to be achieved, archeologists must formulate research questions and collect the data appropriate for answering them.

A sample of the many possible research questions which could be examined in eastern Kentucky are presented below. These questions demand that basic methodological approaches to data collection be implemented in order to ensure that the appropriate data are collected. These approaches are outlined under each goal as research strategies.

Goal 1: Culture History

A. Research Questions

1. What are the diagnostic characteristics of the artifact assemblages for each local archeological unit?
2. What are the local cultural developments? Can drainage systems be used to structure the definition of these developments?
3. What are the regional cultural developments for the Eastern Mountains as a whole?

B. Research Strategies

1. Identify all sites in the project area.
2. Identify and define archeological units.
3. Determine the absolute and relative dates for each unit.
4. Build local chronologies.
5. Develop regional syntheses.

Goal 2: Reconstruction of Past Lifeways

A. Research Questions

1. What are the diagnostic site types for each local archeological unit? What types of settlement systems existed in the Eastern Mountains region during each of the defined cultural periods?
2. Can population density be calculated for the region during each cultural period? Can population movements into and out of the region be documented?
3. What evidence of trade and exchange can be identified for the region? What were the routes used for trade and exchange, and did these routes

change over time?

4. What was the relationship between the Eastern Mountains population and the Adena/Hopewell developments within and outside the region?
5. Why do particular chert resources appear to have been utilized during one cultural period, but not in other cultural periods? Can this phenomenon be explained by denied access to resources, population movement, cultural preference?
6. Can ethnographic Indian groups be identified in the archeological record of the region? Can ethnic/tribal boundaries be identified in the Eastern Mountains archeological record?
7. What were the climatic conditions for each cultural period? What kinds of resources were available, and which were exploited during each cultural period? Can recognized Holocene climatic changes be used to interpret cultural developments in the Eastern Mountains?

B. Research Strategies

1. Define the spatial boundaries of each archeological unit.
2. Define function(s) of each site and each unit.
3. Integrate site data into testable settlement/subsistence models.
4. Reconstruct the paleoenvironment for each cultural period.
5. Reconstruct the paleodemography for each cultural period.
6. Identify trade and exchange networks.

Goal 3: Explanation of Culture Process

A. Research Questions

1. What can the information concerning plant domestication in the Eastern Mountains offer for our understanding of the processes of and cultural changes associated with plant domestication?
2. What kinds of models can be developed concerning culture change from the Eastern Mountains archeological record?

B. Research Strategies

1. Analyze the observed temporal and spatial variability in the cultural record.
2. Generate new theory to refine existing models.
3. Develop testable models of culture change.

Research questions and strategies similar to those outlined above can be presented for historic cultural properties as well. Site significance is intimately linked to research potential, and therefore sites which may help answer questions such as those presented above will in all probability meet the criteria for inclusion in the National

Register of Historic Places.

Research in Kentucky's Eastern Mountains holds the potential for answering a number of important questions related to both prehistoric and historic cultural developments. Unfortunately, an enormous amount of basic descriptive and comparative research, approached in a systematic and rigorous manner, must be conducted in order to lay the foundation for future studies directed at lifeway reconstruction and the explanation of culture process. Enlightened management of the cultural resources on FMO lands will help protect these valuable cultural resources, and provide the basic information needed to understand the region's cultural developments.

In a recent paper entitled "Standards for Planning in Context," King (n.d.) has identified specific planning components necessary for the comprehensive identification, evaluation, and treatment of archeological and historic properties that may be effected by federal undertakings, especially those connected with mineral development. The keystone for efficient management of such properties is a cultural resource overview. This component is presented in the following volume. Other necessary planning elements include 1) identification strategies,2) evaluation system,3) treatment strategies, and 4) recommendations for implementation and monitoring.

King (n.d.:7) suggests that identification strategies should address two major objectives: 1) predicting the nature, distribution, location, and density of historic and archeological properties that occur in the project area; and 2) establishing methods for additional identification and documentation of previously unrecorded properties.

There is an overwhelming need to obtain accurate information on the densities and distributions of archeological and historic properties throughout the project area, for the professional community and for the land-managing agency officials alike. Unfortunately, the existing data base in the study area severely restricts any attempt to fully address the first of these objectives. If BLM wishes to address the objective of predicting the nature, distribution, location, and density of historic and archeological properties, certain prerequisites must be met. A statistically valid sample of the Eastern Mountains region must be surveyed (Pollack 1981:63; Collins and Brooks n.d.), and initial site location predictions must be formulated for later testing.

Once the predictive model is prepared, small survey projects may be treated as individual sampling units. The results of such small-scale investigations can then be incorporated into the regional sampling design. The

necessary prerequisite for analysis lies in the standardization of data variables to be recorded. It is recommended that investigators conducting surveys in the study area in the future be required to gather comparable data that have utility for testing the predictive model.

The archeological literature for eastern Kentucky, except very recently, contains little information regarding methods and techniques employed for additional identification and documentation of previously unrecorded properties, King's second objective for identification strategies. Site discovery is a function of the interplay between a number of factors, such as:

a)how much land surface in the project area is obscured by vegetation;

b)cultural factors such as vandalism, urban encroachment;

c)field techniques employed to locate sites;

d)average size of sites in the project area; and,

e)average density of cultural materials within sites and their distribution.

Because of heavy vegetation in most localities within the project area, we have no way of appropriately assessing the degree to which recorded sites represent the totality of archeological resources in the area. This is true for surveyed as well as unsurveyed areas.

King (n.d.:1,12) suggests that planning in context requires an "endemic evaluation system" that is based on the National Register criteria (36 CFR Sec. 60.6) but that is also meaningful in terms of the study area's prehistory or history. The National Register of Historic Places, created with the enactment of the National Historic Preservation Act (1966), represents an inventory of districts, sites, structures, and objects that are determined to be significant on a local, state, or national level. The criteria by which properties may be determined eligible focus upon integrity of location, design, setting, materials, workmanship, feeling, and association. Properties that meet any one of the following criteria may be considered for inclusion in the National Register of Historic Places. They must be properties that:

a)are associated with events that have made a significant contribution to the broad patterns of our history; or

b)are associated with lives of persons significant

in our past; or

c)embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,

d)have yielded, or may be likely to yield, information important in history or prehistory (36 CFR Sec. 60.6).

It is important to note that archeologists cannot determine the eligibility of any property, but can only make recommendations regarding a site's potential for meeting one or more of the National Register criteria. A site can only be determined eligible for inclusion in the National Register of Historic Places through the process outlined in 36 CFR Part 63. One procedure by which field archeologists may conclude whether or not specific properties may potentially meet National Register criteria is outlined in Chapter VI of this report. Each phase of the four-step process is intimately tied to the National Register criteria and focuses upon site extent, age, integrity of deposit, and research potential.

King (n.d.:16) lists five options readily available to management agency officials with regard to archeological and historic properties that may be affected by a federal undertaking. These include:

1. retention of the property in-place, and unchanged;

2. adaptive reuse and rehabilitation of the property in-place;

3. relocation of the property;

4. recordation and data recovery; and,

5. destruction without recordation or data recovery.

These treatment strategies are based on two underlying assumptions. The first is that there exists a specific federal undertaking that has the potential to adversely effect an archeological or historic resource. The second assumption is that the threatened property has been determined eligible for inclusion in the National Register of Historic Places.

To our knowledge, there are no immediate plans to lease specific tracts of federal minerals for exploration and

development in eastern Kentucky. Moreover, only one (15WO26) of the 446 recorded properties located on FMO lands has been determined eligible for inclusion in the National Register.

Appropriate treatment of the known FMO sites at this time focuses upon National Register evaluations. Because a portion of the known sites have already been evaluated and found not to meet the National Register criteria, the task is not as monumental as it would at first appear. Those sites located on FMO lands which have been found not significant and for which the field archeologists have recommended "no further work" are presented in Chapter VI (Table 9). BLM should consult with the Kentucky State Historic Preservation Officer to obtain her concurrence that the sites listed in Chapter VI do not meet the National Register criteria. If such concurrence is obtained, BLM has fulfilled its responsibility for these specific sites and no further consideration of them is required.

A second group of sites located on FMO lands have been identified as potentially eligible for inclusion in the National Register but sub-surface testing is required before evaluation can be justified. Each of the sites listed in Chapter VI (Table 10) has been recommended for further testing but these recommendations have not been implemented. It is recommended here that each of these sites be evaluated, but on a priority basis depending upon BLM's immediate plans to lease specific tracts for oil and gas, oil shale, and/or coal exploration and development.

The highest priority for testing should be given to any of these sites which are located on tracts of land scheduled for mineral leasing. BLM should also consider a phased approach to sub-surface testing of these sites that allows an as yet to be determined number of sites to be evaluated on an annual basis. It may be prudent, for example, to initiate site evaluations first in Berea, London, Somerset and Stearns Ranger Districts, of the Daniel Boone National Forest, based upon coal inventory assessments. Not only is the coal of good quality in these areas, but the potential for coal that can effectively be deep-mined is quite high in these areas (Richard Brook, personal communication, 1982). Sites that may potentially be affected by mining in these areas are those listed in Jackson, Rockcastle, Pulaski, Laurel, Whitley, and McCreary counties.

Conversely, the potential for coal in the northern half of Daniel Boone National Forest is low. Although site evaluations are required by Section 110 of the National Historic Preservation Act of 1966, as amended, the priority for testing sites located in Morehead and Stanton Ranger Districts, of the Daniel Boone National Forest (Lee, Estill, Wolfe, Powell, Menifee, Morgan, Bath, and Rowan counties)

would necessarily be lower than those FMO sites located in the southern portion of the study area. Finally, the Redbird Purchase Unit contains coal of good quality, but the mineral resources are not particularly well-suited for deep mining. Sites located on FMO lands in Owsley, Clay, Leslie, and Harlan Counties should probably receive the lowest priority in the proposed incremental testing program.

An alternative approach to a phased approach of individual site testing focuses upon selective testing of a few representative site types in areas where sites tend to cluster. Given an adequate amount of data to support National Register District nominations, a group of sites could be included in one or more districts but each site would not necessarily require subsurface testing. At the present time there is insufficient data to determine what would constitute a representative sample of the total universe of sites located in the study area but district nominations would provide the vehicle by which such samples could be preserved and protected. BLM may wish to explore this option by consulting the maps submitted with this report.

Six archeological sites located on FMO lands have been excavated. Sites 15MF10, 15WO1, and 15WO2 present some peculiar management problems. Each of these sites was excavated in the first half of this century. The excavation results for the two Wolfe County sites have been published by Funkhouser and Webb (1930). The Hooton Hollow Site (15MF10) was excavated by William G. Haag in 1942 but the field notes were lost and no report of this investigation has ever been published. In all three instances it is not possible to determine how much, if any, of the cultural deposits may remain at these sites. All three sites appear to be very important sites and there may be enough data to justify positive National Register evaluations without additional testing. Nevertheless, BLM is advised to relocate these sites in an effort to evaluate the integrity of the remaining cultural deposits.

The remaining three sites that have been excavated were each associated with reservoir projects. Archeological sites 15BH24 and 15BH37 were excavated to mitigate the impact of innundation from Cave Run Reservoir and similarly, 15PI11 was excavated in advance of flooding by Fishtrap Reservoir. All three sites are now under water and no further consideration of them is required.

The balance of sites located on FMO lands has been identified in the course of various survey investigations and have not been evaluated. These inventory sites require National Register evaluation but the pertinent survey reports do not include recommendations for appropriate treatment, or any clues as to the research potential these

sites might possess. If any of these are threatened by mineral leasing activities, they should be evaluated and appropriate mitigation strategies should be developed in consultation with the Kentucky State Historic Preservation Officer.

As previously noted, the study of eastern Kentucky archeology, despite its rather long history of investigation, has generated little more than highly biased inventory data compiled from cursory surveys and the pioneering research of only a few scholars. The data, contained largely in unpublished reports, theses, dissertations, and published reports with only limited distributions, are very particularistic and descriptive. These documents generally contain only a minimum of comparative data and even less information of a synthetic nature.

The data are extremely biased towards open sites found in the floodpools of various reservoir projects and rockshelters located along the bases of bluff lines. Little information is available on site types and their distributions in the upland portions of the project area. Because most of the data have been accumulated from surveys, not excavations, there is a general and widespread lack of temporal control as evidenced by the large number of sites that can only be designated as "general prehistoric". Moreover, historic sites have only recently been reported in connection with survey investigations and these remain under-represented in the list of known sites. Survey data alone is inadequate for determining the number or nature of cultural components contained in any one site.

The management responsibility for these archeological and historic properties located on FMO lands, despite BLM's lead agency status, is not clear cut. As previously stated in Chapter I, the largest portion of federally owned minerals in Kentucky underlies surface property which is managed by the U.S.D.A. Forest Service, Daniel Boone National Forest. The U.S. Army Corps of Engineers also manages a minor portion of the surface property under consideration. This split authority can only hamper the development and implementation of an efficient management program for cultural properties located on FMO lands unless each agency is willing to cooperate and coordinate project planning as this relates to mineral development. It is recommended that BLM initiate consultations between each of these agencies, the Advisory Council on Historic Preservation, and the Kentucky State Historic Preservation Officer for the development of an interagency agreement regarding the treatment of cultural resources located in the study area.

The focus of such an agreement should center on the development of an historic preservation plan or program for

the region. This program should minimally include six important aspects which will be discussed below:

1)An overview and research design that identifies the types of archeological, architectural, historic, and cultural properties (cultural resources) that may be expected to occur on FMO lands should be prepared. The overview should also present research topics to be addressed, and establish survey or other appropriate strategies for the identification and evaluation of all cultural resources in the study area that may meet the criteria for inclusion in the National Register of Historic Places. The following volume should be considered a foundation for this requirement.

2)The preservation program should establish an appropriate strategy for completing Class II and III surveys. These may include both long-range planning surveys directed at developing the capacity to predict archaeological site location, and short-range inventory efforts for specific lease tracts or mine areas. This strategy should also include a schedule for completion of the survey as well as staffing and funding requirements.

3)The historic preservation program should establish procedures to be followed for determining whether or not specific cultural resources meet the National Register criteria, and for reviewing actions to determine the effects on National Register or eligible properties.

4)The program should also include a procedure designed to avoid adverse impacts on cultural resources whenever possible. This may incorporate an assessment of alternatives to avoid such effects by project re-design, re-location, or mitigation where avoidance is not prudent and feasible. If mitigation is required, the preservation program should include an established procedure for selecting an appropriate mitigation measure which includes consultation with interested parties.

5)The preservation program should ensure that reliable, comparable, and scientifically valuable information is collected and disseminated.

6)The preservation program should outline an appropriate organizational scheme which will ensure coordinated effort among the interested parties for the identification, evaluation and preservation of cultural resources located in the study area.

Once the historic preservation plan has been developed, there must be a provision for periodic review and refinement of the plan. It is recommended that such review be regularly conducted by all interested parties at five-year

intervals. The review should include not only an evaluation of the program's effectiveness, but should update the overview presented in this document and set forth any new research topics which should be investigated, as well as retire those topics which have been adequately addressed. The periodic review should also be used to formally refine and assess any models generated for the prediction of archeological site location that is subsequently developed.

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I. INTRODUCTION

In 1979, the Department of the Interior (DOI) established a program whereby coal and other mineral reserves owned by the Federal Government could be offered for development and commercial production through competitive lease. In spite of multiple Federal agency ownership, the Bureau of Land Management (BLM) was assigned lead agency responsibility to ensure that such leasing and subsequent development was conducted in an environmentally acceptable manner. In eastern Kentucky, most of the federally owned minerals were identified on lands which underlie surface property managed primarily by the U.S.D.A. Forest Service, Daniel Boone National Forest. In addition, scattered U.S. Army Corps of Engineer project areas were also included. While surface coal mining on National Forests has been prohibited by law east and north of the 100th meridian, underground mining and associated activities have been and continue to be permitted.

Pursuant to Section 110 of the National Historic Preservation Act of 1966, Federal agencies are charged with the responsibility to identify, evaluate, and protect significant cultural and historic properties located on lands under their control or jurisdiction. Mandates such as the Antiquities Act (1906), the Historic Sites Act (1935), the National Historic Preservation Act, as amended (1966), the National Environmental Policy Act (1969), the Archeological and Historic Preservation Act (1974), and the Archeological Resource Protection Act (1979) reflect the government's increasing awareness of the need for careful management and preservation of significant elements of our Nation's cultural heritage. By such legislation, the government is committed to policies which guarantee that the fragile traces of our past are identified and protected from haphazard development and thoughtless destruction. Consistent with Congressional intent and accepting lead agency responsibility, BLM has contracted for a Class I inventory study of cultural resources located within its area of responsibility in eastern Kentucky, that is, the discontiguous tracts in a 35-county area where there is Federal Mineral Ownership (FMO).

The study area is located in four of the seven management regions designated in the Kentucky State-wide Research Design (Clay 1980); the Blue Grass, Eastern Kentucky, the Upper Cumberland, and the Upper Kentucky/Licking (Figure 1). Each of these management units corresponds to traditional geographic and topographic regional divisions within the Commonwealth. Due to the distribution of federally owned minerals, not all of the counties included in each of these

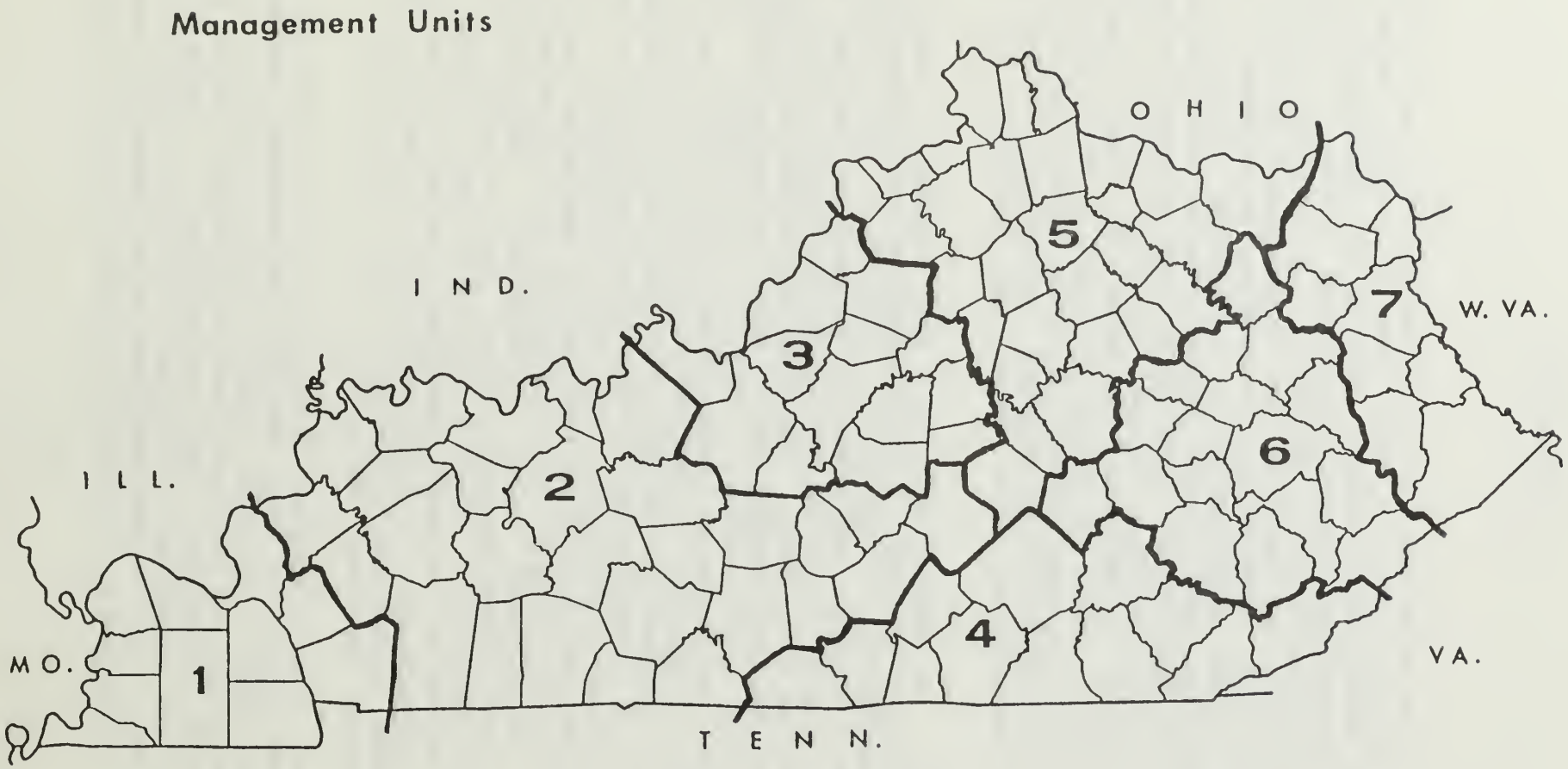

Figure 1. Kentucky Preservation Management Areas: 1) Purchase 2) Green River 3) Falls 4) Upper Cumberland 5) Bluegrass 6) Upper Kentucky/Licking 7) Eastern Kentucky (Clay 1980:20)

management units have been considered. Table 1 presents the counties included for study. The specific tracts of FMO lands within each of these counties are limited to Daniel Boone National Forest, the Redbird Purchase Unit, and Fishtrap and Yatesville Reservoirs (Figure 2).

BLM Manual 8111 defines a Class I inventory as a literature search and data review that results in a synthesis of existing cultural resource information. The objective of such an overview lies in the identification of all recorded sites (cultural, historical, and archeological) within a designated study area in order to provide specific data for BLM's various planning and management requirements. The Class I investigation provides a context within which sites may be evaluated and from which planning and management decisions may take place. The review of published and unpublished literature allows for identification of the prehistoric and historic cultural developments in the study area, the types of cultural remains which occur in the study area, and the research questions that have been asked of these data in the study area. Moreover, a critical evaluation of these data allows for the identification of biases in the data base.

The following overview has been written with these objectives in mind. The document is divided into five basic parts that include 1) a discussion of the study area's past and present environmental setting, 2) a review of the cultural developments that have occurred in the study area, 3) a discussion of the existing data base with particular emphasis on the biases inherent to this information pool, 4) a discussion of potential research questions and problem domains for future researchers specific to eastern Kentucky, and 5) management recommendations with regard to the results of the overview.

This document is supported by a second report, Known Cultural Resource Site Record Compilation for BLM Federal Mineral Ownership Properties in a 35 County Area of Eastern Kentucky prepared by Charles M. Niquette and W. Lane Shields (October 1982). Federal agency officials are advised to make use of each report, since they both contain information relevant to planning decisions which may potentially have an adverse impact upon recorded archeological, architectural, historical, or cultural properties located on FMO lands. Agency managers should be aware that the site record compilation contains confidential information. Indiscriminate transmission of this report could easily lead to illegal collection of artifacts and to the ultimate destruction of extremely valuable scientific information.

The overview and the site record compilation are further supported by U.S.G.S 7.5 minute series maps that reveal site locations of all recorded archeological and historic

Table 1. Eastern Kentucky Counties Included in this Study.

Upper Cumberland	Upper Kentucky/Licking
*Bell (BL)	Breathitt (BR)
*Harlan (HL)	*Clay (CY)
Knox (KX)	*Estill (ES)
*Laurel (LL)	*Jackson (JA)
*McCreary (MCY)	Knott (KT)
*Pulaski (PU)	*Lee (LE)
Wayne (WN)	*Leslie (LS)
*Whitley (WH)	Letcher (LR)
	Magoffin (MG)
Eastern Kentucky	*Menifee (MF)
Boyd (BD)	*Morgan (MO)
Carter (CR)	*Owlsley (OW)
Elliot (EL)	Perry (PE)
Floyd (FD)	*Powell (PO)
Greenup (GP)	*Rockcastle (RK)
Johnson (JO)	*Rowan (RO)
*Lawrence (LA)	*Wolfe (WO)
Martin (MT)	
*Pike (PI)	
Bluegrass	
*Bath (BH)	

* Counties which contain FMO lands.

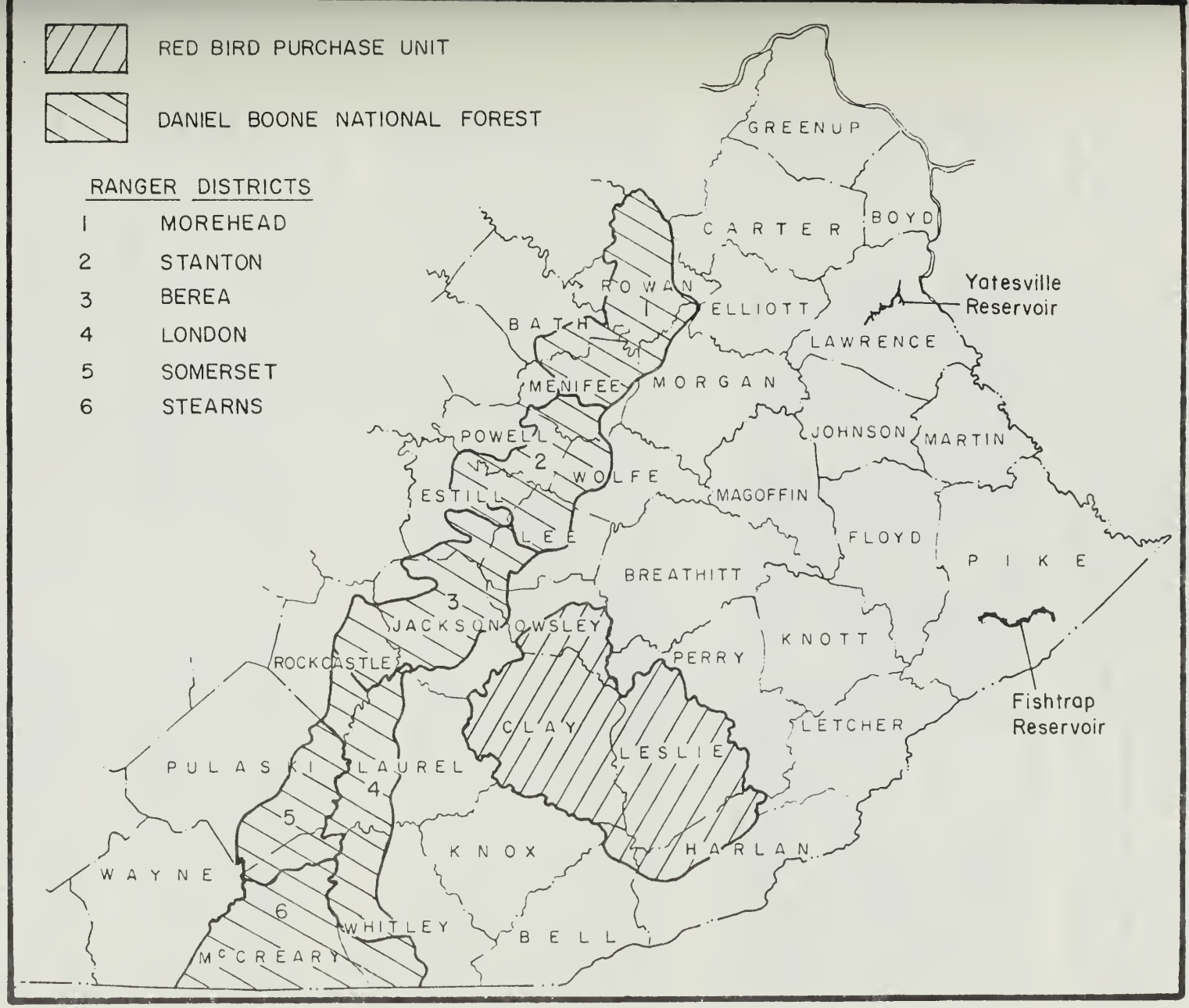

Figure 2. Thirty-five County Area of Eastern Kentucky Showing Primary Federal Ownership Areas

properties located on FMO lands. These data are also considered confidential and should be treated accordingly. It must be emphasized that the lack of sites recorded on specific tracts of FMO lands reflects a dearth of survey carried out in these areas rather than any paucity of sites.

It is important to note that while the following discussion of the region's environment and cultural developments in Chapters II and III encompasses a 35-county region in eastern Kentucky, management recommendations in Chapter VI deal specifically with FMO lands, which are confined to 21 of those counties. The distribution of known archeological and historical properties located on FMO lands is restricted to 18 of these 21 counties. In order to avoid unnecessary confusion, the authors have defined "eastern Kentucky" or the "Eastern Mountains" as the entire eastern portion of the state. The terms "project area" and "study area" refer to those counties and potential lease tracts of federally owned minerals.

II. ENVIRONMENTAL BACKGROUND

A. INTRODUCTION

A discussion of environmental factors is important to developing an understanding of human use and occupation of the Eastern Mountain region of Kentucky. Throughout the 12,500-year period of human habitation in eastern Kentucky, both prehistoric and historic peoples have influenced and been influenced by their surrounding environment. And while the environment does not determine which human choices will be made, it does provide the setting within which socio-cultural preferences are realized. To at least a certain degree, the highly varied cultural record in the Eastern Mountain area is a reflection of the range of environmental possibilities presented to each cultural group which has occupied the region.

A discussion of the cultural developments in the Eastern Mountains would thus be incomplete without describing important features of the area's environment. These include geology/topography, soils, climate, flora, and fauna. Description of these features will of necessity be general, given the environmental diversity of the study area. For more detailed environmental discussion of selected areas in the region under consideration, the reader is directed to Wyss and Wyss (1977) for the Red River Gorge in Wolfe and Menifee counties, and Wilson and Finch (1980) for the Cumberland Wild River section in McCreary and Whitley counties.

B. GEOLOGY/TOPOGRAPHY

Eastern Kentucky is located in the Appalachian region of eastern North America. A variety of environmental zones and resources are located in this region. Since the topography and the major soil series are directly related to the underlying rock strata (Bladen 1977:97; Bailey and Winsor 1964:9), it seems prudent to begin discussion of the environment with a description of the area geology.

The greatest portion of eastern Kentucky is underlain by Lower to Middle Pennsylvanian-age sandstones (Figure 3), although conglomerates and shales also occur. In some localities stream action has exposed Mississippian-age Newman limestone. Recent alluvium is located in the stream valleys and flood plains in the area and along the Ohio River. This region is called the Eastern Mountains or the Eastern Coalfields physiographic province due to the

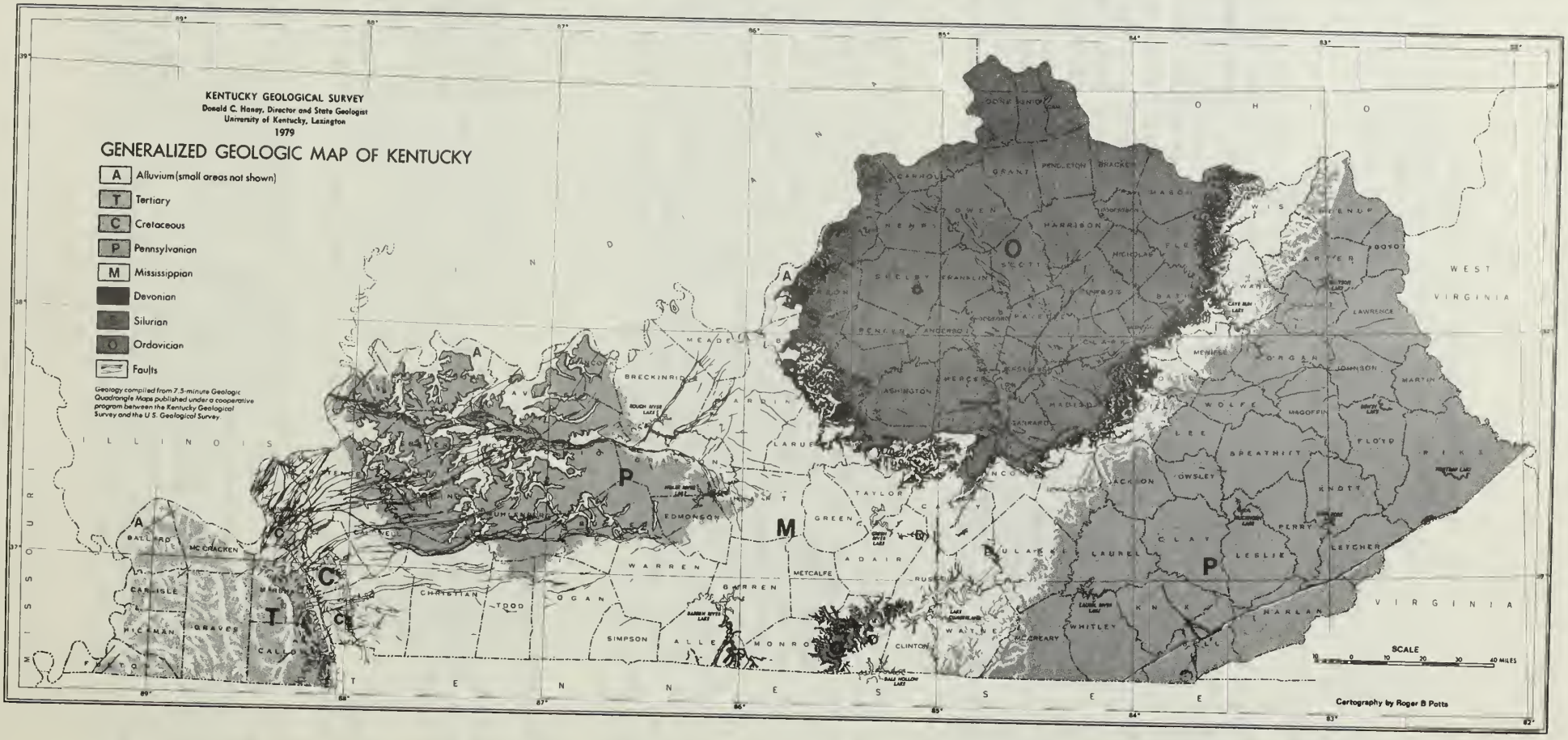

Figure 3. Geologic Map of Kentucky.

significant amounts of low sulphur coal contained in the Pennsylvanian deposits.

The Eastern Mountains physiographic province (Figure 4) occupies approximately one quarter of Kentucky (Mather 1977:10), and can be divided into three subareas based on topography:

1.the more mountainous eastern area,
2.the west central plateau area, and
3.the escarpment area on the western edge.

This extreme southeastern section of eastern Kentucky is the only location in Kentucky where rocks were uplifted and folded to form mountains. Pine Mountain was created by an overthrust fault which exposed Mississippian and Devonian-age rocks. Cumberland Mountain and the Middlesboro Syncline were similarly formed by folding and faulting. The Pine and Cumberland Mountain ranges are composed of Lee Conglomerate, the name given to the projecting edge of the Rockcastle sandstone in this region (Schwendeman 1979:27). The mountainous eastern area is a series of valleys and high, forested mountain ridges. Cumberland Gap, the doorway for early settlers to the west and also used by the aboriginal inhabitants, is located in this area. The highest point in Kentucky, Big Black Mountain (4,150 feet above MSL) is also located here. This area is drained by the headwaters of the Cumberland River (Figure 5).

The west central plateau area has been divided somewhat arbitrarily by Fenneman (1938:283-284) into the 1)unglaciated Allegheny Plateau, drained by the Licking River and the Big Sandy River, and the 2)Cumberland Plateau, drained by the Kentucky River (Figure 5). A maturely dissected plateau, irregular, winding, narrow-crested ridges and deep, narrow valleys characterize the topography in this area. The high relief and dissected nature of the area serves to isolate valleys from one another, and also creates a wide diversity of microenvironmental zones. The Cumberland Plateau generally has higher relief than the Allegheny Plateau. The Red Bird Purchase Unit, and the Yatesville and Fishtrap reservoirs are located in this area.

The escarpment area forms the western edge of the Eastern Mountains physiographic province. It consists of a great wall of rock called the Pottsville Escarpment, which is made up of the hard, coarse-grained Rockcastle Sandstone Conglomerate. This conglomerate is more resistant to erosion than the underlying rocks and frequently forms clifflines with rockshelters at the base. These rockshelters are particularly prevalent in the Corbin and Rockcastle members of the Lee Formation. Deep gorges characterize this region and the Red River Gorge, the Cumberland River Gorge, and Cumberland Falls are notable

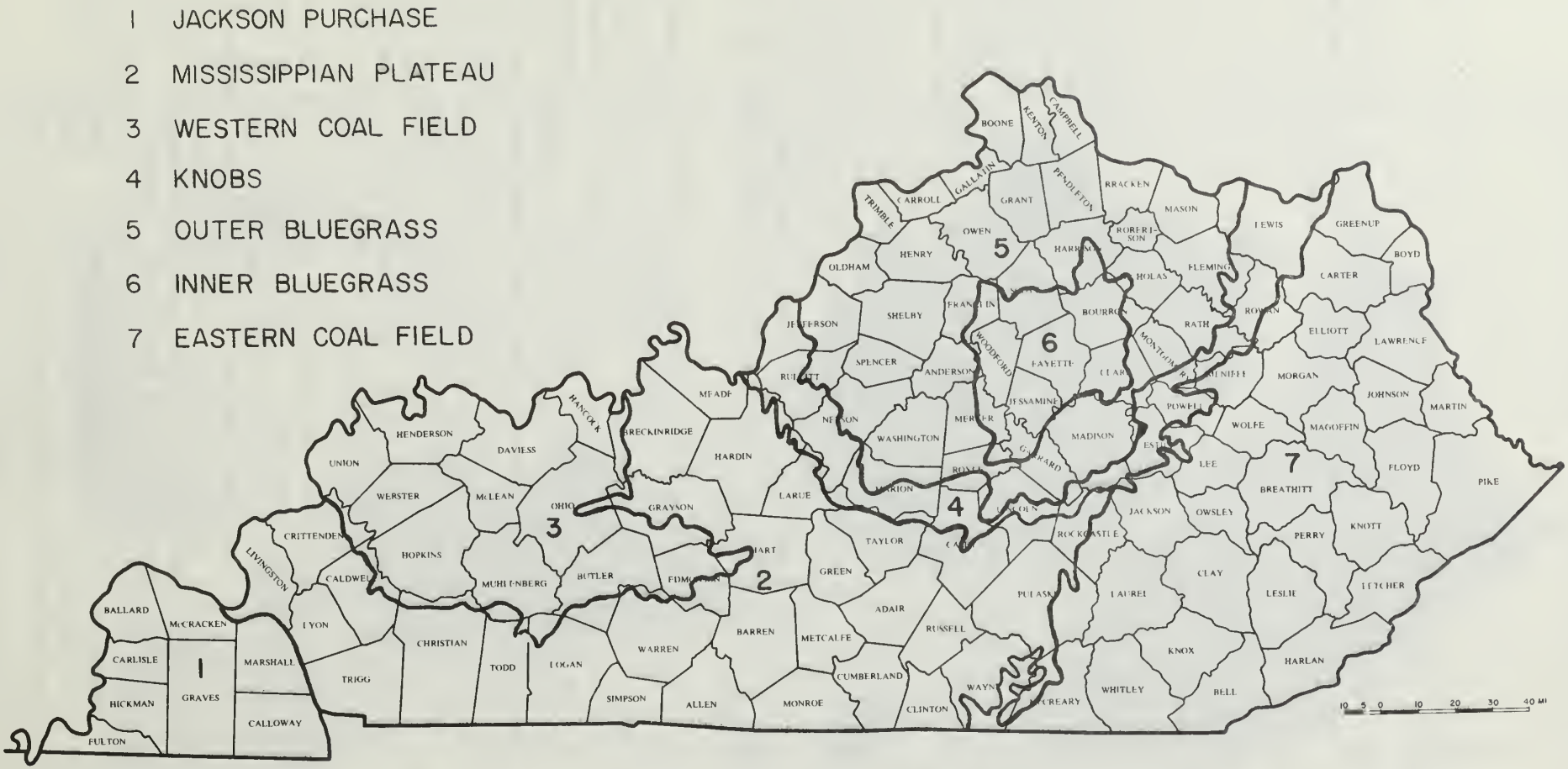

Figure 4. Kentucky Physiographic Regions

Figure 5. Major Drainages in Eastern Kentucky

examples. Daniel Boone National Forest straddles the Pottsville Escarpment.

On the whole, the Eastern Mountains area is extremely rugged. Most modern settlement is located along narrow floodplains and lower mountain slopes. Railways and highways are located alongside the streams (Mather 1977:11). Mobility is greatly restricted by the topography, and this ruggedness and lack of mobility increases generally from west to east (Bartnik et al. 1981:5). The nature of the topography has had a great influence on historic settlement, farming practices, transportation and the growth of industry. It was not until 1911, when the first railroad was built through the region that coal became an important commodity (Jillson 1919:301-305). Other industries such as saltpeter mining, production of iron ore, and salt have also been hampered by the cost of transporting these minerals out of areas which could produce these resources. Presently, the production of coal and natural gas is a major economic activity in eastern Kentucky.

The Eastern Mountains region is a cultural as well as a natural region. Distinctive ideas and traditions characterize its society. Problems of isolation, poverty, education, and health are due in part to the area's rugged terrain. Large areas remain unsettled and the average population density is below the state average (Mather 1977:11).

Prehistoric man was also affected by the area's rugged topography, which acted to isolate regions and restrict mobility. Chert was a major prehistoric commodity, found in the Mississippian-age limestones (Paoli and Haney cherts), Middle Devonian Boyle Dolomite (Boyle chert),and Quaternary-age alluvium deposits. Jobe et al. (1980:8) identified Flint Ridge, Brassfield, and St. Louis cherts in alluvial deposits during their survey of areas in the Daniel Boone National Forest.

The westernmost counties in the study area exhibit much more geologic diversity (Figure 3). Here, the Pottsville Escarpment separates the Eastern Mountains physiographic province from the Eastern Pennyroyal and Outer Bluegrass physiographic provinces. Mississippian-age limestones, but with some shales, siltstones and sandstones,occur along the western edge of the Eastern Mountains region, interfingering with the Pennsylvanian rocks. These Mississippian-age deposits are known as the Eastern Pennyroyal (or Mississippian Plateau) physiographic province (Figure 4). Wayne, Pulaski, and Rockcastle counties are located in this physiographic province.

The oldest rocks in the 35-county area of eastern Kentucky are located in western Estill, Powell, and Bath

counties, and in parts of Rowan and Pulaski counties. These are Devonian, Silurian, and Ordovician-age rocks (Figure 3). The Devonian and Silurian-age deposits are composed of shales, sandstones, and some limestones. Ordovician-age rocks are mainly limestones, with some calcareous shales and siltstones. The Knobs, Outer Bluegrass,and Hills of the Bluegrass physiographic regions are associated with these strata (Figure 4). Estill and Powell counties are located in the Knobs, Bath County,and a portion of Rowan County are located in the Outer Bluegrass physiographic province and the western portion of Bath County is located in the Hills of the Bluegrass

The Eastern Pennyroyal region is generally undulating to hilly, but the Cumberland River area is more rugged. The Knobs separate the Pennyroyal and Eastern Mountain areas from the Bluegrass, and consist of round, conical hills, the erosional remnants of the surrounding uplands. The edge next to the Pennyroyal area is hilly and rough, but towards the Bluegrass, there are wide valley floors and bottomlands between the Knobs. The Outer Bluegrass exists as three discontinuous arcs located around the outer edge of the Bluegrass region, and consists of a more rolling topography. The Hills of the Bluegrass occur between the Inner and Outer Bluegrass as a well-dissected plateau characterized by narrow winding ridges and valleys (Bladen and Bailey 1977:109-114).

C. SOILS

Soils reflect the topographic feature with which they are associated and the conditions under which they were formed. Soil differences arise from disparities in the underlying parent materials, topography, and length of time exposed to weathering processes. In Kentucky, almost all soils, except stream deposits, have developed under hardwood forest cover and under essentially the same climatic conditions (Bailey and Winsor 1964:8). Soils formed under these conditions are generally more acidic than those found in evergreen forests. These soils generally have a thin, dark surface layer and are relatively infertile, requiring a controlled fertilization program after a very few years of use (Bailey and Winsor 1964:8).

Soils of the Eastern Mountains belong to the Dekalb-Muskingum-Jefferson-Stendal series, and are discussed in more detail in Bailey and Winsor (1964). Since 1964, soil series for the Eastern Mountains have been re-evaluated and renamed. The series now includes Shelocta-Jefferson-Rarden-Weikert soils (Balden and Bailey 1977:110) but a full description of these soils has not yet appeared in print.

Dekalb and Muskingum soils are the major upland soils found on ridge-tops and steep side slopes. Dekalb soils are moderately deep, excessively drained loams, and formed in the residuum of acidic sandstones and shales. Although they occur mainly under mixed hardwood stands, they also occur in areas which have been cleared and used for crops and pasture. Dekalb soils have a very low natural fertility, due to high acidity, low organic matter content, and tendency to drought. These soils are best suited to growth of trees or pasture, since cultivation would result in extreme erosion, especially on steep slopes.

Muskingum soils resemble Dekalb soils, except that they are well-drained and tend to be siltier. They also have low natural fertility. Because of their steepness, droughtiness, and low fertility, Muskingum soils are best used as forest or pasture.

Mountain and ridge-foot slopes and alluvial fans are generally covered with soils from the Jefferson soil series. These are well-drained silty loams, which vary in texture from graveled to cobbled to stoney. Like the Dekalb and Muskingum soils, Jefferson soils are low in natural fertility and are important in the production of timber lands. With proper management, Jefferson soils can respond with fair to good crop yeilds.

Stendal soils are poorly drained, sandy loams formed from the alluvium of acid sandstones and shales and have a moderately high natural fertility. They are found on floodplains, benches, and lower foot slopes along large streams and in areas of nearly level floodplains. Areas of more fertile soils account for only a small proportion of the total acreage in the Eastern Mountains, and while they are the most agriculturally productive series in the region, they are by no means superior soils on any absolute scale. Their agricultural importance stems from the fact that in rough sections, where suitable cropland is scarce, they can provide good yield for row crops (corn, soybeans) and meadow.

As in Section B, soils from the Eastern Pennyroyal, Knobs, Outer Bluegrass and Hills of the Bluegrass physiographic regions will only be briefly described here. More detailed descriptions of soils in these areas can be found in Bailey and Winsor (1964) and in the following county soil surveys:

1. Boyd and Greenup Counties (Hail et al. 1979)
2. Menifee, Rowan and northwestern Morgan Counties (Avers et al. 1974)
3. Bath County (Weisberger et al. 1963)
4. Elliott County (Weisberger et al. 1965)
5. Estill and Lee Counties (Newton 1974)

6.McCreary-Whitley Area (Byrne 1970)
7.Pulaski County (Ross 1974)

Soils in the Eastern Pennyroyal are underlain by mostly limestone, and are of medium to low fertility. Soils of the Knobs are shallow, with many rock outcrops, and are thus poorly suited to farming. Valley soils in the Knobs area are generally acid, have a low organic content, and many are poorly drained, but when properly treated, produce fairly well (Bladen and Bailey 1977:7). Soils in the Outer Bluegrass region have less phosphate and are suited to general farming. Soils in the Hills of the Bluegrass are high in phosphorous, lime, and potassium, but are droughty. About 10% of this area is suitable to row crops (Bailey and Winsor 1964:28).

In summary, soils found in the Eastern Mountains are generally upland soils of low natural fertility, and are best suited to timber production. In the west central plateau area, however, some areas are rather well suited to farming, especially after applications of lime and fertilizer. About 5% of the land in the Eastern Mountains is suitable for farming, and this land is located in the stream bottoms. In 1977, 7% of the land was in crops, 12% in pasture, and 81% was in forest (Bladen and Bailey 1977:113).

If prehistoric soils in the region were similar to today's soils, few areas could have supported horticultural/agricultural subsistence activities. Areas conducive to agricultural practices, prehistorically and historically, were limited to the stream and river bottom lands. Any use of marginally productive agricultural lands would have required extra soil preparation (like the historic application of lime) or special crop rotations or periodic field movement. Only in modern times, with improved agricultural practices,have the more marginal areas been cultivated successfully.

The lack of large areas of good farm land in the Eastern Mountains probably affected prehistoric peoples' acceptance of horticulture. Indeed, during much of Eastern Mountains prehistory, plant cultivation appears to have been a minor subsistence strategy, and influences of the more agriculturally-inclined cultures appear to have been slight, or were modified to suit the special circumstances of the region.

Historically, the lack of good farm land meant that farms were small, and that residents pursued a more diversified subsistence economy (Hicks 1976:18-28). There was no need to personally own large-scale farm machinery since plots were relatively small. Co-operatives, or sharing between neighbors,was more common. Lack of large amounts of fertile

farm lands contributes to the importance of coal mining and other extractive activities as viable economic pursuits. Even today rural residents in eastern Kentucky can be characterized as semi-subsistence farmers who have supplementary employment in coal mining or forest industries (Raitz and Withington 1977:125). Along the western edge of the region, in the other physiographic regions, farming and agriculture play a more important role in subsistence, due to the availability of suitable farm land.

The last 300 years of Euroamerican occupation have resulted in a greater amount of soil loss by erosion than the cumulative volume of damage for all the preceding years of human occupation in the region combined (Trimble 1972). Eastern Kentucky's rivers are laden with silt carried by runoff, even though the destructive farming practices of the 18th and 19th centuries have been abandoned. Contour farming and other conservation measures have checked, but not stopped, the loss of top soil from inter-riverine areas. Strip mining practices in eastern Kentucky have also contributed to soil erosion, as well as water pollution in the headwaters of the Big Sandy Drainage, the Kentucky River Drainage, and the Cumberland Drainage (Bladen and Towber 1977:162).

While the results of forest clearing, erosive farming practices,and strip mining have accelerated site destruction in some localities (cf. Ford, Rolinson and Medford 1972), these activities have preserved many riverine sites under great quantities of silt, sand,and other alluvial sediments. Trimble (1972) has reported that many Piedmont valleys of South Carolina, for example, have been covered with approximately 1.2 meters of alluvium in the past 200 years. Sorenson et al. (1980) have documented this phenomenon for the Salt River in central Kentucky. Obviously, riverine aggradation and degradation has a profound effect upon archeological sites that once occupied the surfaces of the river bottoms. Such sites will be either preserved by being deeply buried, or destroyed by natural processes such as scouring and downcutting. The problem for the archeologist of today, therefore, is to locate those portions of "the alluvial landscape where the preservation of intact buried archeological sites is most likely" (Thompson and Bettis 1980:1).

D. PRESENT CLIMATE

Today's climatic conditions in the study area are very similar to those reported by the early settlers in the 1750's. Kentucky's climate has been classified as humid continental, exhibiting a significant temperature range between seasons and a moderate amount of rainfall. Warm summers and cool winters are the norm, and when extreme in temperatures occur, they are usually not prolonged.

In the Eastern Mountains, temperatures average a few degrees cooler than other areas of the state, due to greater elevations, and greater distance from the active low/high pressure system storm track (Raitz and Bladen 1977:120). Winter temperature highs average 42 degrees F, while low winter temperatures average around 26 degrees F. In the summer, high temperatures average 85 degrees F and summer lows average around 66 degrees F (Bailey and Winsor 1964:6-8). The average number of frost-free days in the Eastern Mountains is 164 (Raitz and Bladen 1977:120). Prevailing winds come from the south and west; however, in winter months, winds frequently come out of the north. Wind velocity is usually gentle, averaging 6-13 mph, but fierce storms often accelerate wind speeds up to 60 mph (Bailey and Winsor 1964:6-8).

Between 46 and 50 inches of rainfall occurs in eastern Kentucky annually. However, over half of this precipitation occurs between April and August: spring is usually the wettest season and autumn the driest. Occasional storms with heavy rainfall can cause flash flooding on the smaller streams and creeks. Damage from spring and summer floods, (and increasingly from winter floods) is becoming more common with more intensive use of floodplains (Raitz and Bladen 1977:117).

This description of the climate of the Eastern Mountains is a generalized description of the typical weather patterns which occur in the region. However, in areas with considerable topographic variation, such as the Eastern Mountains, local climatic conditions are affected by factors such as relief, slope aspect, angle of slope, type of plant cover, etc. (Bartnik et al. 1981:6). These local climatic variations (creating in effect a number of "micro-environments") must be kept in mind when considering the relationship between man and the environment. The effect of these "micro-environments" may have been to create a number of "micro-cultural" responses to this environmental diversity.

Historically, different responses to the environment have become somewhat minimized due to increased modernization, ease of communication and the like. However, the environment continues to influence cultural expressions of

modern man in eastern Kentucky.

E. PAST CLIMATE

Although today's climate successfully accounts for the historic period and portions of the prehistoric period, the climate of the region has changed considerably since the first inhabitants arrived in the area. Climatic reconstructions for eastern Kentucky are unavailable, but studies of pollen recovered from the dry rockshelters of the region (Cowan et al. 1981) may someday help scientists understand the climatic conditions which occurred in the area.

Delcourt and Delcourt (1981:123-165) have recently developed vegetation maps for eastern North America that span the past 40,000 years. These maps are based upon pollen profiles drawn from approximately 100 localities extending from Florida to Canada and from eastern Texas to Minnesota. These data suggest that the period between 21,000 B.C. to 14,500 B.C. represents peak glacial conditions, with the maximum advance of the Laurentide Ice sheet to a point north of the Ohio River, well south of what is known today as the Great Lakes Region. Glacial deposits in Ohio which mark the maximum extent of glaciation extend from southwestern Ohio northeast to the Pennsylvanian border (Prufer and Baby 1963:49). The Delcourts (1981:145) indicate that a 60 to 100 kilometer wide belt of tundra existed along the southern flank of the ice sheet as well as in discontiguous localities along the crest of the Appalachians as far south as the Great Smoky Mountains. Most of Kentucky, the Ouachita, and Ozark Mountains, and the eastern Great Plains were covered with Spruce and Jack Pine Forests at this time. There was also a narrow band of Conifer and Northern Hardwood Forest extending west from South Carolina to northern Mississippi. To the south, oak-hickory and Southern Pine forests dominated the Gulf and Lower Atlantic Coastal Plains.

Since vegetation reconstructions reflect major climatic changes, these data represent fossil records for the interpretation of Late Pleistocene and Holocene paleoenvironments. Pollen cores containing 25% or more of herb pollen and major components of birch, alder, willow, and spruce are indicative of the pollen rain in tundra environments. Spruce and Jack Pine Forests generally reflect pollen frequencies that are low in herb pollen values but which demonstrate that spruce was dominant and jack pine (red pine) was a subdominant. Mixed Conifer and Northern Hardwood Forests include constituent components of hemlock, Haploxylon pine, Diploxylon pine, spruce, fir, oak, birch, elm, ash, ironwood, maple, and beech, all of which in combination are cool-temperate arboreal taxa. Over the past

40,000 years, the southern latitudes of the eastern United States have contained varying amounts of deciduous forest cover of which there are three significant forest types: the Oak-Hickory, Mixed Mesophytic, and Oak-Chestnut Forests. The constituent taxa of each include many cool-temperate and warm-temperate deciduous arboreal species. Oak is the dominant taxa of the Oak-Hickory Forest with hickory pollen representing at least 2.5% and Diploxylon pine pollen contributing less than 25%. The Mixed Mesophytic Forest is characterized by oak, maple, beech, basswood, elm, walnut, hemlock, and gum. Finally, the Oak-Chestnut Forests are dominated by oak with chestnut pollen contributing 1% or more of the total tree pollen. The Gulf and Atlantic Coastal Plains have reflected warm-temperate species of the Southeastern Evergreen Forests for the past 40,000 years. In varying percentages of total pollen represented, these species include Diploxylon pine, oak, gum, hickory, cypress, sweet gum, alder, and birch (Delcourt and Delcourt 1981:123-132).

Although eastern Kentucky was never covered by glacial ice, the ice margin was close enough to affect the area's climate, vegetation, and fauna. A treeless, alpine zone extended down into the Great Smoky Mountains at the higher elevations (Martin 1958:382). Pollen evidence from Buckle's Bog in extreme western Maryland (Maxwell and Davis 1972) documents the presence of tundra vegetation in the area at this time.

Man appeared during the end of the Late Glacial period (13,050-8,500 B.C.). Martin characterized this period as a time of glacial stagnation and retreat, accompanied by several climatic reversals and ice readvances. After the retreat of the last glaciers, the area experienced a considerable climatic improvement, and the alpine tundra almost entirely disappeared from the southern Appalachians. At Buckle's Bog, a significant change in vegetation from tundra to boreal woodland is dated at 10,750 B.C. (Maxwell and Davis 1972). The southern deciduous climax forests began to develop and the Pleistocene megafauna extinctions took place during this period. Martin (1958) has suggested that these extinctions may have occurred in part due to the appearance and settlement of man in North America, although he does not explain how this may have occurred. He also suggests that areas in the climax forest may have been greatly modified as the result of man's use of fire (Martin 1958:395), promoting the growth of pioneer species and/or consolidation and subclimax growth in these areas. Between 13,000 and 8,000 B.C., the pine-spruce forests of the preceding period were gradually replaced by forests of oak and hickory among lesser species such as birch, hemlock, beech, and elm.

Delcourt and Delcourt (1981:147) suggest that a more accurate reconstruction may reflect an eastward expansion of Spruce and Jack Pine Forests moving into western Kentucky and Middle Tennessee at this time. The middle latitudes of the southeastern United States (34 degrees N to 37 degrees N latitudes) witnessed a northern expansion of the Mixed Conifer and Northern Hardwood Forests which gradually replaced regions formerly dominated by Jack Pine and Spruce. The deep south remained stable with a forest cover of Oak, Hickory and Southern Pine.

During what is known as the Climatic Optimum, (8,000 to 3,000 B.C.), there appears to have been a climax in the development of the oak-hickory forests of the Southeast. The climate was generally warmer and drier than at present. Delcourt and Delcourt (1981:147) suggest that the Laurentide Ice Sheet had retreated to a point north of the Great Lakes Region at this time. Tundra was restricted to the St. Lawrence River Valley and New England with relict stands of spruce and fir found in the higher elevations of the southern Appalachians. There was a northern advance of both the oak-hickory and mixed hardwood forests with a corresponding northerly shift of the Mixed Conifer and northern hardwood forests. The area between 34 and 37 degrees northern latitudes appears to have been dominated by a mixed hardwood forest.

Between 6,000 and 2,000 B.C., the Great Plains experienced a period of increased warmth and aridity. This climatic change was reflected in the eastern United States by an eastward shift of prairie, oak-savannah, and oak-hickory forest which resulted in a corresponding reduction of the mixed hardwood forests. The latter were restricted at this time to gorge and slope ecotones of the Cumberland and Allegheny Plateaus. The central and southern Appalachians were dominated by Oak-Chestnut Forests. The mixed conifer and northern hardwood forests were localized in southern Canada and the oak-hickory and southern pine forests were confined to the Ozark and Ouachita Mountains (Delcourt and Delcourt 1981:150). After 3,000 B.C., pines became particulary dominant in the central Appalachians and an increase in tropical maritime air mass led to an abundance of southern pines on the Atlantic and Gulf Coastal Plains (Delcourt 1979:277).

In attempting to account for the development of certain prehistoric cultures, some archeologists have suggested that their development can be partially explained by their occurrence during one of the environmentally favorable "pulsations" which occurred during this period (Griffin 1960; Baerreis and Bryson 1965).

From approximately 3,000 B.C. to the present, there was a cooling trend and increased levels of precipitation. This

climatic change was reflected by a westward retreat of the prairie-forest boundary and the development of marshes and swamps in coastal Louisiana (Delcourt and Delcourt 1981:150). The vegetation of eastern Kentucky took on the characteristics that may be observed today during this period.

This capsule summary of Holocene environmental change may be misleading. Much of the paleoenvironmental data is extrapolated from work of other reseachers interested in the Southeast (cf. Chapman and Yarnell 1974; Carbone 1974; Whitehead 1973; Bryson and Wendland 1967; Bryson et al. 1970). Moreover, the interaction between climate and biotic communities is extremely complex and affected by numerous independent variables which, while not well understood, allow ecological adjustments to occur in response to changes in the weather (House and Ballenger 1976).

F. FLORA

The native floral cover of the Eastern Mountains has been classified as the Mixed Mesophytic Forest (Braun 1950:39). Originally this forest type covered "most of the land in this region, except on the dry ridgetops and upper south-facing slopes, the flood plains and certain peculiar physiographic features such as the southeastern slope of Pine Mountain" (Wharton and Barbour 1973:17). Brooks et al. (1979:19-24) discuss a number of travelers accounts that contain discriptions of what the floral communities were like in early Kentucky.

Historic logging and land clearing, and the chestnut blight of the 1930's have completely removed the original mixed mesophytic forest. Today 81% of the Eastern Mountains area is covered in forest, but these are second- and third-growth forests. Robinson Forest in Breathitt County and a few stands in scattered locations are all that remain of semi-virgin timber in the region. Modern forests are more moisture deficient than the original forest cover, due primarily to erosion that occurred between removal and regrowth. Oak, oak-hickory, and oak-pine communities constitute the majority of the modern eastern Kentucky forest community (Wharton and Barbour 1973). The following discussion of eastern Kentucky's floral communities is drawn primarily from Jobe et al. (1980:11-14) (also see Appendix A).

The original climax forest was the oldest and most complex of all deciduous forest formations. A large number of species achieved dominance in this type of forest. The most common species of trees were: basswood, beech, birch, black cherry, chestnut, hemlock, sugar maple, red maple, sweet buckeye, white ash, red oak,white oak, and tulip tree.

Although black walnut, sour gum, and several species of hickory occurred in a large number of stands, they never appeared as dominant species.

Several species of smaller trees, shrubs, and herbaceous plants grew as understory (Wharton and Barbour 1973). Smaller growth trees included alder, dogwood, hawthorn, holly, magnolia, ironwood, striped maple, sourwood, and service-berry. Shrubs such as rhododendron, maple-leaved arrowroot, wild gooseberry, oil nut, American elder, sweet elder, and ginseng occurred in the Eastern Mountains forest, and abundant species of herbaceous plants which offered highly nutritious and medicinal properties (Braun 1950: 40-46).

Just as an understanding of more localized climatic conditions must be kept in mind when characterizing the climate of the region, so too the localized floral diversity must be remembered. Regional differences in the forest communities in the Eastern Mountains region are reflected in Braun's (1950:87-88) description of three major topographic/environmental zones:

1. the Cliff Section,
2. the Low Hills Belt, and
3. the Rugged East area.

The Cliff section, located in the Pottsville Escarpment area, is best represented in the Red River Gorge area, where portions of the landscape existed which were either too wet or too dry to support a mixed mesophytic forest. True mesophytic forests in this area were relegated to the ridge slopes (Braun 1950:88, 97-102). Hemlock communities were dominant in the deep, narrow gorges. Dry ridge-tops were occupied by either open pine forests of pitch, short leaf, and Virginia varieties, or oak-dominated forests.

In the Low Hills Belt, located between the Cliff Section and the Rugged Eastern Area as a 25-mile wide strip of land, the mixed mesophytic forest was probably relegated to coves and lower ravine slopes. Moist valley bottoms contained stands of red maple, sweet gum, pin oak and a rich growth of swamp herbs. White oak-beech, mixed oak, and oak-hickory forests were common on the low hills.

In the Rugged Eastern Area, the mixed mesophytic forest was located on moist slopes, extending to the ridgetops. Sugar maple-basswood-buckeye-tulip poplar segregates were found mainly on north-facing slopes. Upper slopes and ridgetops were occupied by oak-chestnut and oak-hickory communities. Pine was located on ridgetops where rock outcrops occurred, and beech and white oak were dominant where shale was the underlying rock.

Native floral resources were used by prehistoric and historic populations alike. Artifacts recovered from dry rockshelters in the Eastern Mountains testify to the prehistoric use of plant materials for a wide variety of purposes. Wild plant fibers were used as cordage for mats, containers, and clothing. Information recovered from archeological contexts indicates that the inner bark of pawpaw, leatherwood, Indian hemp, and milkweed, and leaves and stems of canary grass were used as raw materials for cordage. Split cane fragments have been found in several shelters, identified in the manufacture of woven basketry, cradles, arrow shafts, mats, and torches (Jones 1936:160-161; Cowan 1975:49; Cowan 1976:32-34; Wyss and Wyss 1977:93-94).

Wild plants were also used as sources of food. Nuts such as black walnut, acorn, hickory, chestnut, hazelnut, and butternut have been identified from prehistoric contexts. Wild fruit seeds have also been recovered, such as wild grape, plum, pawpaw, and blackberry. Important information concerning early plant domestication has been recovered from a number of dry rockshelters. Domesticated exotic species such as squash or pumpkin, bottle gourd, and corn, as well as domesticated local plants such as pigweed and goosefoot (varieties of chenopodium), marsh elder, ragweed, sunflower, and canary grass have been recovered.

In the historic period, while cultivating modern plant species has been a major source of income, natural plant species are collected in some parts of the Appalachian Mountains to supplement family income. Hicks (1976:20-21; 25-26) discusses gathering galax (a low-growing scrub used by florists as background foliage), ginseng, pennyroyal, dog-hobble, bloodroot, and spearmint.

G. FAUNA

In addition to varied floral resources, the prehistoric and early historic inhabitants of the Eastern Mountains region were surrounded by a rich native faunal environment. However, increased human activity, in the form of settlement, land clearing for farming, and, more recently, land clearing for strip mining, has drastically reduced the numbers and types of animals found in the region. More than 20% of the native Kentucky mammals are listed as rare or endangered (Barbour and Davis 1974:3-12). Observations made by early settlers and pioneers, and the information from archeological sites, offer insight into what kinds of animals were available during those periods. Today, the native fauna of eastern Kentucky are not included as a major subsistence resource, and are hunted as supplementary food and/or for sport (Hicks 1976:28). The following discussion of the fauna of eastern Kentucky is drawn primarily from

Jobe et al. (1980:14-15) (also see Appendix B).

A wide variety of native mammal species was located in eastern Kentucky. These included such animals as white-tailed deer, black bear, bobcat, river otter, raccoon, beaver, weasel, mink, woodchuck, a number of fox and squirrel species, opossum, eastern cottontail, bat, and numerous species of mice, rats, and other small rodents. Buffalo, which appeared in the area after A.D. 1600 and which the earliest settlers encountered, no longer inhabit the area. Likewise, animals such as cougar, wolf, and elk, remains of which have been found in the region archeologically, are no longer found in the Eastern Mountains. Elk and deer remains in archeological contexts are numerous, and attest to their importance in the aboriginal subsistence system. Used not only for food, the bones of these animals were also used as tools and decorative items.

Birds were also another resource available to the prehistoric and early historic settlers. Owl, heron, mourning dove, wood duck, ruffled grouse, quail, species of vulture, hawk, and perching bird as well as wild turkey were exploited for food. Wild turkey is the most common species of bird recovered from archeological contexts, but the remains of duck, heron, vulture, and other smaller birds have also been found.

Reptilian and amphibian animal species also occurred as native fauna in eastern Kentucky. Several species of turtle, snake, lizard, and frog lived in the many and varied environmental niches located in the region. Box turtle has been recovered from archeological sites. The meat was probably eaten; the turtle shell was used as spoons, dishes, gorgets, and rattles. Frogs have also been identified from archeological contexts.

Aquatic resources such as fish and mollusks were available in the area, and fish bones and mussel shells have been found in archeological deposits to testify to the fact that they were utilized. In addition to their being a food source, mussel shells were also used as hoes, and manufactured into beads, spoons, and gorgets. During the Late Prehistoric and Contact periods, crushed mussel shell was used as a ceramic tempering agent. Fish species which occurred in native eastern Kentucky include gar, crappie, catfish, bluegill, pike, sunfish, and several species of bass.

III. CULTURAL DEVELOPMENTS IN EASTERN KENTUCKY

A. INTRODUCTION

The cultural past of eastern Kentucky extends at least as far back as 12,500 years ago (Figure 6). Although archeologists have documented a long sequence of prehistoric and historic cultural developments during this time span in eastern Kentucky, this sequence is only partially understood, and then only in the most general of terms. This ambiguity stems from very limited amount of theoretical, substantive, or synthetic research that has been conducted to date in this region. Biases and deficiencies in the regional data base will be discussed in more detail in Chapter IV.

For convenience, this chapter is divided into two major parts: 1) the prehistoric era, which begins with the earliest evidence of man in Kentucky and extends up until the time of Indian/Euroamerican contact; and 2) the historic period, which is characterized by the presence of written documentation beginning at Contact and ending with current events in modern Kentucky. The following discussion will focus on general trends that have been observed in the prehistory of eastern Kentucky, with specific reference to sites in and adjacent to the study area. Extra-regional sources pertinent to the definition of cultural developments in eastern Kentucky were included when it was felt that this information would help clarify the regional picture. The term "tradition" will be used here to define "specific patterning of subsistence practices, technology, and ecological adaptations" (Willey 1966:4). Cultural "periods" will be used to denote specific time spans. Where information is available, cultural units, components, and phases will be included. Following traditional archeological convention, the data will be presented for the Paleo-Indian, Archaic, Woodland, Late Prehistoric, and Contact periods.

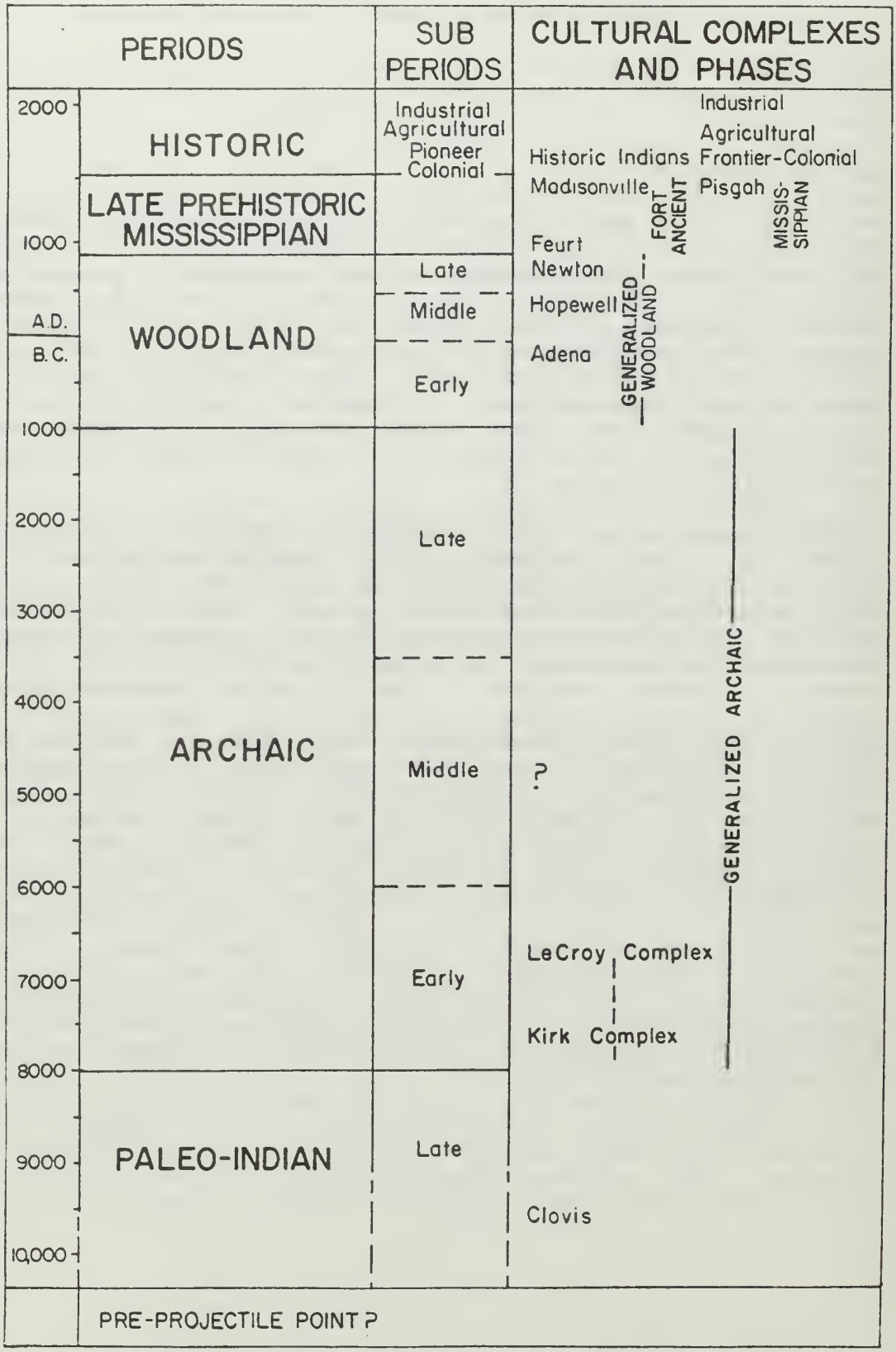

Figure 6. Chronological Time Line for Eastern Kentucky

B. PREHISTORY

1. The Paleo-Indian Period (? - 8,000 B.C.)

There appears to be little argument that man arrived in North America by traveling across what is now the Bering Strait on the land bridge which stretched from Siberia to Alaska (Dragoo 1976:4). Investigators suggest that these earliest Americans followed the Pleistocene megafauna onto this continent, thereby populating both North and South America. This may have occurred as early as 40,000 B.C. (Muller-Beck 1966). However, archeologists are still debating 1) when these early settlers arrived, and 2) if there exists on the North American continent, a pre-projectile point or "pebble tool" horizon similar to that which has been documented for the Old World (Jennings 1978:2-20). If such a pre-projectile point horizon exists, it would necessarily date prior to 10,500 B.C.

Evidence for a pre-projectile point horizon has been documented in Alabama (the Lively Complex (Lively 1965)), at Debert Site in Nova Scotia (MacDonald 1968), and at Wells Creek Site in Tennessee (Dragoo 1973). At Meadowcroft Rockshelter in western Pennsylvania, dates in excess of 17,000 B.C. have been recovered from the deepest microstrata in Stratum IIa (Adovasio et al. 1978:638-639). Evidence from these sites is not unquestionable, however, since pebble tool artifacts (i.e., choppers, scrapers, planes) persist through time into the Paleo-Indian and later periods. Conclusive proof of the existence of Early Man on the North American continent must await further research.

The earliest cultural period conclusively documented from the Eastern Mountains is Paleo-Indian. Dragoo (1976:5) has dated this period in the eastern United States from about 10,500 B.C. to 8,000 B.C. Mason (1962:236), however, has suggested that this period may have begun as early as 13,500 B.P. (12,450 B.C.), based on what is known about North American glacial history at the close of the Pleistocene.

Man's arrival in eastern Kentucky was closely associated with the movements of the Pleistocene glaciers. During the Paleo-Indian period, the last of these glacial advances and retreats, called Valders, occurred. Although the glaciers never actually extended into eastern Kentucky, the climatic effects of the glacier were probably felt. A cooler, moister climate affected the composition and distribution of floral and faunal communities (Delacourt and Delacourt 1982), although the specific effect in eastern Kentucky is not well understood (see Chapter II, Section E. for a more detailed discussion of the paleo-environment).

Distinctive lanceolate-shaped, often fluted projectile points, called Clovis,are the artifactual hallmarks of the early part of the Paleo-Indian Period. Unifacially and bifacially chipped tools such as knives, scrapers, and spokeshaves, endscrapers with spurs,drills, and gravers have also been recovered. Artifacts and tools of wood,bone, and shell are inferred to have also been used, but poor preservation of these artifact types has prevented recovery. Eastern Kentucky's dry rockshelters have the potential for yeilding perishable artifacts of wood, bone, and shell used during this period.

In the Plains area, Paleo-Indian points recovered from subsurface contexts have been found in direct association with extinct Pleistocene megafauna (Jennings 1978:27). Often these sites have been interpreted as kill sites. This has led archeologists to hypothesize that these early Americans were engaged full-time in hunting big-game Pleistocene mammals, such as mammoth, mastodon, giant beaver, bison and Pleistocene horse, to the exclusion of plant resource utilization.

However, in the eastern United States, fluted points have not been recovered in association with extinct Pleistocene fauna. Quimby (1960:27-33) thinks that even without this association, archeologists may still postulate that Paleo-Indian peoples were hunting mastodons in the Upper Great Lakes. MacDonald (1968), on the other hand, has proposed that perhaps caribou were the preferred game. Evidence to support this suggestion has been found at Holcomb Beach in Michigan (Fitting et al. 1966), where caribou remains were found in a hearth associated with Paleo-Indian fluted points.

The traditional picture of Paleo-Indian lifeways consisting of big-game hunting almost exclusively is currently viewed as too simplistic. As a result of his work at the Flint Run Complex sites in the Shenandoah Valley, Gardner (1974, 1977) has developed a model of Paleo-Indian subsistence and settlement which places more emphasis on plant food resource utilization and mobility within a restricted area. Gardner (1979:12) defined five basic functionally related sites (quarries, quarry reduction areas, quarry-related base camps, base camp maintenance stations,and outlying hunting sites) that make up the Paleo-Indian settlement system. He has suggested that the major focus of this settlement system was the procurement of raw materials for use in lithic tool manufacture.

Gardner (1977:261) offers an alternative explanation to the general opinion that Paleo-Indians were highly mobile populations constantly in pursuit of game. Instead, he envisions a more selective mobility pattern within a delimited territory, the core of which was the base camp.

Prime hunting areas were periodically revisited, as were lithic resource zones and productive plant food collecting areas. Gardner's scenario essentially echoes Caldwell's position (1958:6-11) which suggested that in addition to the practice of prairie nomadism based on big-game hunting, large numbers of these early people practiced a forest nomadism, relying on hunting and gathering wild plant foods. This type of lifeway is very similar to that postulated for the Archaic Period.

Although Paleo-Indian type sites are located in the western Plains area, more fluted points have been found in the Midwest and Southeast than in the Plains (Jennings 1978:27). Early Paleo-Indian Clovis points occur abundantly below the glacial margin around the Ohio River, and are particularly common in Kentucky, Tennessee, Alabama, and Georgia (Dragoo 1976:9). Gatus and Maynard (1978) have noted the association of Paleo-Indian points with karst features in the Bluegrass and Mississippian Plateau physiographic regions in Kentucky.

Unfortunately, the great bulk of Paleo-Indian points found in the eastern United States have been recovered from surface contexts (Mason 1962:233). The Eastern Mountains region of Kentucky is no exception. Clovis points were recovered from KX5 in Knox County (Turnbow and Allen 1977b), and in Pulaski County (Allen and Griffin 1978). Kentucky Heritage Commission Archeological Survey reports for Floyd, Perry, and Knox counties have also documented Clovis points (Sanders and Gatus 1977:Figure 37; Gatus and Sanders 1978:129 and Figure 29; DeLorenze and Weinland 1980).

Paleo-Indian sites in the eastern United States where Clovis points have been recovered from subsurface contexts include Bull Brook in Massachusetts (Byers 1954), Shawnee-Minisink Site in Pennsylvania (Marshall 1978), Wells Creek Site in Tennessee (Dragoo 1973), Debert Site in Nova Scotia (MacDonald 1968), and Modoc Rockshelter in Illinois (Fowler 1959). At Meadowcroft, despite the lack of diagnostic fluted projectile points, subsurface remains which date to the Paleo-Indian Period were recovered. These include Mungai knives, bifaces, flake blades, and debitage, as well as four firepit features (Adovasio et al. 1977). The earliest positively dated Paleo-Indian component in North America (14,225 +/-975 B.C.) was recovered from Stratum II at this site.

In eastern Kentucky, Rolingson (1964:60) has documented one Clovis basal fragment from the midden at the Mayo Site (JO14), and two crudely formed Meserve (Dalton) points. These points were not associated with any features and were interpreted as fortuitous occurrences in the midden. Dunnell (1972:23) has interpreted the remains of hearth which appeared in a profile 440 cm. below surface at the

Slone Site (PI11) in the Fishtrap Reservoir as a very early component. Early materials were also recovered at PI26 at Fishtrap, but each of these sites lacked an adequate amount of investigation to conclusively assign these materials to the Paleo-Indian Period.

With the retreat of the glaciers, the environment began to change, and the Pleistocene megafauna became extinct. Regional archeological complexes began to develop (Dragoo 1976:10) as new projectile points replaced the Clovis point tradition. This change occurred as a result of human adaptations to the changing environment. In the Southeast, Clovis fluted points gave way to Cumberland, Quad, Dalton (Meserve),and Hardaway-Dalton projectile points. These last two points are representative of the transition from the late Paleo-Indian to the Early Archaic Period.

Important sites in the Eastern Woodlands with subsurface Late Paleo-Indian remains include the Hardaway Site in North Carolina (Coe 1964), the Quad Site in Alabama (Soday 1954), and Graham Cave in Missouri (Chapman 1957). Sites in western Kentucky with late Paleo-Indian/Early Archaic artifacts recovered from subsurface contexts include the Henderson Site in Lyon County, the Roach Site in Trigg County, and the Morris Site and Parrish Site, both in Hopkins County (Rolingson and Schwartz 1966).

No late Paleo-Indian subsurface remains have been identified in the Eastern Mountains except for the Mayo Site previously mentioned, and a Quad point which was excavated from a deep level in a rockshelter in Rowan County (Purrington 1967b:14). Meserve (Dalton) surface finds have been found at the Brown Site (BR2) in Breathitt County (Webb and Funkhouser 1932:47). In the Big Sandy drainage, a single component Paleo-Indian campsite was located in Boyd County and two multi-component campsites with Paleo-Indian materials were recorded in Lawrence County (Cinadr and Maslowski 1979:7).

As this discussion has served to illustrate, the data from the Eastern Mountains are inconclusive regarding the Paleo-Indian Period occupation of the region. With so little information concerning the Paleo-Indian occupation of the Eastern Mountains, it would be tempting to suggest that the area was not extensively utilized during this period. However, other factors may be contributing to the lack of documented Paleo-Indian remains in the Eastern Mountains. These may include active local collectors, the possibility of Paleo-Indian components being buried under thick alluvial deposits along the rivers, and the lack of excavation of deeply stratified rockshelter deposits in the area (Purrington 1967b:15). We know that Paleo-Indian materials have been located in the area, but can say very little regarding distributions of Paleo-Indian materials. We can

say even less concerning the specific lifeways of these people. Clearly, the Paleo-Indian Period as expressed in eastern Kentucky remains fertile ground for future investigations. There is no reason to believe that Meadowcroft Rockshelter in western Pennsylvania is unique. As additional excavation occurs in eastern Kentucky, other equally important Paleo-Indian components will be discovered.

2. The Archaic Period (8000 B.C.-1000 B.C.)

The Archaic Period includes a long span of time during which important cultural changes took place. It is generally agreed that Archaic cultures evolved from late Paleo-Indian expressions of the Southeast and Midwest, since there is growing evidence for the existence of transitional cultural manifestations (Funk 1978:19). These manifestations probably occurred in response to environmental changes which took place at the close of the Pleistocene.

The Archaic is customarily divided into three sub-periods: Early (8,000-6,000 B.C.), Middle (6,000-3,500 B.C.), and Late (3,500-1,000 B.C.). During the early part of the Archaic, the last glaciers had retreated, and the arctic-like boreal forest was developing into the eastern deciduous forest. By the Middle Archaic, the environment in the Eastern Mountains was much as it is today. In response to the changing environment, with its associated changes in plant and animal life, Late Archaic peoples developed a more diversified subsistence strategy based on local choices from a variety of subsistence options, which included hunting, plant food gathering, fishing, and in some areas the beginnings of plant domestication in a planned seasonal round exploitation strategy. Caldwell (1958:6-18) has called this Archaic subsistence approach "primary forest efficiency". This strategy appears to have continued well into the Woodland Period in the Eastern Mountains. (Purrington 1967b; Blakeman 1971b; Dunnell 1972).

Except for the adoption of new projectile point styles, such as Kirk, LeCroy, St. Albans, Palmer, and Charleston, Early Archaic tool kits are nearly identical to those associated with the Paleo-Indian Period. The fact that these projectile point styles are found over a very large area suggests that little regional subsistence diversity occurred during the Early Archaic. Early Archaic subsistence strategies are believed to have been similar to those employed by Paleo-Indian peoples, although a greater variety of game was hunted. The scarcity of tools associated with the preparation of plant foods and fishing in the early part of the Archaic indicates that hunting was

probably still the major subsistence activity (Dragoo 1976:11). Archaeological investigations at a number of deeply buried sites in the Southeast have served to outline the cultural developments which occurred during the Archaic: the St. Albans Site in West Virginia (Broyles 1971), the Longworth-Gick Site near Louisville, Kentucky (Collins 1979), three sites in the North Carolina Piedmont (Coe 1964), and Modoc Rockshelter in Illinois (Fowler 1959).

In the Middle Archaic the environment was more like today's. Increasing regionalization of artifact inventories and the addition of new artifact classes and projectile point styles imply the development of extensive exploitation strategies. The Middle Archaic is marked by the introduction of groundstone artifacts, manufactured through pecking, grinding and polishing: adzes, axes, bannerstones, and pendants. A number of these groundstone tools, such as manos, mortars and pestles, and nutting stones interpreted as plant food processing artifacts, indicate an increasing utilization of plant food resources during the Middle Archaic.

Greater regionalization is also noted in new projectile point styles during this sub-period: stemmed and corner notched points such as MacCorkle, Morrrow Mountain, Stanley, and Big Sandy II appear. A variety of bone tools including antler projectile points, fish hooks, and gouges suggest an improved efficiency in exploiting local resources. Middle Archaic sites tend to contain larger accumulations of materials than those of earlier periods, suggesting an increased group size and/or longer periods of occupation (Cohen 1977:191). Important sites in the Southeast with Middle Archaic components include sites in the Little Tennessee such as Icehouse Bottom (Chapman 1977), Eva in west Tennessee (Lewis and Lewis 1961), North Carolina Piedmont sites (Coe 1964), and Modoc Rockshelter (Fowler 1959).

Chapman (1975) has suggested that Archaic projectile points were probably used in conjunction with the atlatl, a device which increases the distance and accuracy of a thrown spear. The recovery of bone and groundstone objects (bannerstones) in Middle Archaic contexts interpreted as atlatl weights tends to support Chapman's suggestion (cf., Neuman 1967:36-53). Certain classes of chipped stone tool artifacts such as scrapers, unifaces, drills, and gouges, indicate a continuation of their importance from the Paleo-Indian Period.

The Late Archaic was a time of continued cultural expansion and complexity which grew out of the previous periods. Dragoo (1976:12-15) has discussed several Late Archaic traditions for the Eastern Woodlands. Their distinctiveness stems from varied responses to each regional

environment reflected in their material culture. Straight-stemmed, basal-notched or contracted-base projectile points types characterize this subperiod: Brewerton, Merom-Trimble, Motley, Riverton, and McWhinney. The remains of steatite vessels in Late Archaic contexts are the precursors of the ceramic vessels which appear during the Woodland Period. Judging from the greater number of sites which have been noted for the Late Archaic, an increase in population can be postulated. Evidence of longer and more intensive site occupation suggests in some cases extended habitation within an area.

Archeologists have inferred from ethnographic analogy drawn from surviving hunter-gatherer groups in remote areas of the world that Late Archaic groups were probably organized in nomadic or semi-sedentary bands, with scheduled seasonal movements in response to the available faunal and floral resources. Late Archaic settlement generally reflects a series of camps located to take advantage of seasonal environmental resources. Artifact inventories for the Late Archaic reflect these diversified responses to a wide variety of environmental conditions.

In areas of southern and eastern West Virginia (McMichael 1968), southwestern Virginia (Holland 1970), and in southeastern Kentucky (Dunnell 1972), archeologists have documented the shift during the Archaic from the use of chert for the manufacture of projectile points in the Early Archaic to a preference for materials such as quartzite, silicified shale, and ferruginous sandstones during the Late Archaic. It is important to note that chert was not ignored as a raw material for lithic tool manufacture during this time, but that these other materials were added to the raw material inventories. At present, it is unclear whether the use of materials other than chert to manufacture projectile points was the result of some groups having limited or no access to chert resources, or a cultural preference for non-chert materials (Ison and Pollack 1982). During the Woodland Period, chert was again the favored chipped stone resource.

The population increase and an increased mortuary ceremonialism have led some investigators to postulate that a more complex social organization was developing in some areas of the eastern United States. Along the Green River in west-central Kentucky, large shell mound sites such as Chiggerville (Webb and Haag 1939), Indian Knoll (Webb 1946), and Carlson Annis (Webb 1950) contain hundreds of human burials illustrative of complex mortuary practices and a rich ceremonial life. The development of inter-regional trading networks is indicated by the recovery of copper,

marine shell and other non-local artifacts from Late Archaic burials (Winters 1968). These foreign materials testify to the growing complexity of the ritualism connected with the burial of the dead, but also to the interaction of many groups which would have facilitated the exchange of not only goods but also ideas (Dragoo 1976:17).

The appearance of cultigens in Late Archaic contexts has been interpreted as evidence of early plant domestication and use of these plants as subsistence resources. Evidence of early cultigens has been documented at such sites as Koster in central Illinois (Brown 1977:168), at the Carlson Annis and Bowles sites along the Green River in west-central Kentucky (Marquardt and Watson 1976:17), and at Cloudsplitter Rockshelter in eastern Kentucky (Cowan et al. 1981).

Streuver and Vickery (1973) have defined two plant complexes domesticated at the close of the Archaic, which continued in use into the Woodland Period. One group consisted of non-native plants such as gourd, squash, and corn. The other was a group of native plants such as chenopodium, marsh elder, and sunflower. Struever and Vickery (1973) suggested that the native cultigens were cultivated first, and that the non-native, tropical cultigens were introduced later. Recent research in Missouri, Kentucky, and Tennessee, however, suggests that squash was under cultivation in the mid-south by the late 3rd millenium B.C. (Adovasio and Johnson 1981:74), and that by the second half of the 2nd millenium B.C., evidence from Illinois, Kentucky, and Tennessee demonstrates that squash, gourd, and sunflower were well established (Adovasio and Johnson 1981:74). This more recent evidence contradicts Streuver and Vickery's scenario (Chomko and Crawford 1978).

Most Archaic sites located in the Eastern Mountains region to date have been identified through surface survey, and many have been neither tested nor excavated (Hanson 1964a; Dunnell 1966a; Purrington 1966; Fryman 1967; Dexter 1974a, 1975; Cowan 1975, Fenwick 1976; Sanders 1976; Turnbow 1976; Cowan and Wilson 1977; Sanders and Gatus 1977; Wyss and Wyss 1977; Gatus and Sanders 1978; Jobe et al. 1980; Wilson and Finch 1980; Bartnik et al. 1981; Dugan et al. 1982). Their assignment to either Early, Middle, or Late Archaic sub-periods has generally been based on the lack of ceramics on the site surface, and the presence of diagnostic projectile point types which have been defined elsewhere. Many Archaic sites cannot be assigned to an Archaic sub-period at all due to their lack of diagnostics, and have been relegated instead to a "generalized" Archaic category. Some investigators have defined regional Archaic chronologies (Cowan 1976; Dunnell 1972), but these have not been validated through reference to excavated stratified sites, nor has any regional synthesis been developed to

place these chronologies into a regional perspective.

A few brief comments can be made about the Archaic in the Eastern Mountains from the survey data, however. Generally fewer Archaic sites occur in areas which have been surveyed than sites which have been assigned to the Woodland and Late Prehistoric periods. Hanson (1964a) and Fenwick (1976) note a scarcity of Archaic period sites in the Cave Run and Yatesville reservoirs, respectively. Wyss and Wyss (1977:263) note that over half the bottom land sites in the areas they surveyed in the Red River Gorge had Archaic components, but that rockshelter and upland Archaic sites were rare. Cowan's (1976:123) summary of his work in the Red River Gorge indicates that Archaic sites are located in both river bottoms and rockshelters. While these differences may reflect actual prehistoric settlement patterns, it is probably more likely that these surveys did not include all the possible physiographic zones that Archaic peoples exploited. It is also possible that Archaic materials located in rockshelters are so deeply buried that no evidence of these occupations occurs at the surface. Alternatively, if the shelter is disturbed, Archaic materials may be mixed with Woodland Period materials. More investigations in these regions will likely modify the picture of Archaic settlement in these areas.

Most Archaic cultural deposits in the Red River Gorge represent single components and are generally shallow. Deeper, multi-component or stratified single component sites suggest that the general pattern of site distribution involves specialized temporary or seasonal resource collection camps (Wyss and Wyss 1977:259-260). Dorwin et al. (1970:135-136) described much the same situation in the Cave Run Reservoir area. An important deeply stratified Archaic site has been located in the Red River Gorge area (MF132), one of the few known stratified Archaic sites in that area. However, to date no testing or excavation has been carried out at this site. Hoffman (1966) carried out excavations at two sites, (CR12 and EL2) which he designated as non-ceramic sites, but which he could not assign to an Archaic sub-period.

Sites in the Eastern Mountains which have been defined as Early Archaic based on surface finds of diagnostic Kirk or Kirk-like points include a multi-component site in McCreary County (Wilson and Finch 1980:223), RK36 in Rockcastle County (Dugan et al. 1982:119), McY83 and JA35 in Jackson and McCreary counties, and RO55 in Rowan County (Bartnik et al. 1981:65; 68-69; 77). Four small Early Archaic campsites have been located in Lawrence County (Cinadr and Maslowski 1979:8). At JA28 and RK19, bifurcate projectile points strongly resembling points described by Coe (1964), and by Chapman (1975), were recovered from the surface (Jobe et al. 1980:69; 73-74).

Cowan's (1976) Early Archaic projectile point cluster for the Red River Gorge appears to be identical or very similar to point sequences established at well-documented stratified sites outside the area. Cowan (1976:124) included LeCroy, Kirk corner-notched, and his Types 14 and 16 in this cluster.

Two sites, PO46 and PO49 are major Early Archaic sites in the Red River Gorge Area. The Shepard Site (PO46) is a multi-component site situated on a gently sloping terrace located at the juncture of the North and Middle Forks of the Red River. Fire cracked rock and considerable surface debris indicated that this site was a locus of habitation of considerable intensity (Cowan 1975:93-94; 1976:123). The Jones Site (PO49) is also a multi-component site, located on the North Fork of the Red River. LeCroy projectile points have been recovered from this site (Cowan 1976:114-116). These two sites appear unique in their relative artifact density when compared to other known sites in the area. Both were used repeatedly from the Archaic through Fort Ancient periods.

An important stratified site, which contained Early Archaic deposits, was recently excavated in the Red River Gorge area. At Cloudsplitter Rockshelter (MF36), a few post molds and surface hearths were encountered in the Early Archaic occupation deposits. Cultural materials recovered from these deposits included two Kirk-like corner-notched dart points, and a single LeCroy point (Cowan et al. 1981:63). A radiocarbon date of 8200 +/-225 B.P. (6250 +/-225 B.C.)(GX-5874) was recovered from the Early Archaic level. Earlier dates were recovered from the site, but no diagnostic cultural materials were recovered in association. Late Archaic and Early Woodland materials were also recovered from Cloudsplitter Rockshelter, but no Middle Archaic, Middle Woodland, or Lake Woodland materials were found.

Deep Shelter (RO 34) is an important stratified multi-component site which in the lowest, undisturbed layers revealed substantial evidence of Early Archaic occupation. Features were basin-shaped and exhibited evidence of burning. Two radiocarbon dates, one from a feature with a Type A projectile point, similar to Charleston Corner Notched (Broyles 1971), and another from a feature with a LeCroy point, are 6570 +/-470 B.C. (RL-68) and 5290 +/-550 B.C. (RL-67), respectively (Dorwin et al. 1970:127). Early Archaic deposits indicate occupation and re-occupation reflected by multiple-living and activity layers. Deep Shelter was used for perhaps 8,000 years by peoples who tended to use it in rather similar ways to take advantage of the many environmental zones nearby (Dorwin et al. 1970:133).

While the Middle Archaic has been well defined in the North Carolina Piedmont (Coe 1964) and in western Tennessee (Lewis and Lewis 1961), it has not been adequately defined for eastern Kentucky. Thus, very few Archaic sites in the region have been designated as Middle Archaic. There is at present insufficient data to ascertain whether the paucity of Middle Archaic sites represents a cultural hiatus or if interpretation is simply hampered by typological/chronological problems. The presence of a substantial Middle Archaic component found in any site in the region should be considered extremely important to the solution of this problem.

A number of Late Archaic sites have been investigated in the Eastern Mountains. The Bluestone Site complex (RO35-36) was excavated in Rowan County (Brooks et al. 1979), and radiocarbon dates from features at both sites (2180 +/-160 B.C. from RO35 and 2475 +/- 720 B.C. from RO36) indicate that a substantial occupation of hunters and gatherers occurred at this location, possibly year-round as a base camp (Brooks et al. 1979:155). Feature types included roasting pits, refuse pits, chipping stations, and hearths. No faunal remains were recovered, but chipped and groundstone artifacts and large amounts of hickory and walnut were recovered from the midden and from features. A chert resource study indicated that Paoli chert, one of two immediately available chert sources, was used for the manufacture of chipped stone tools during the Archaic (Brooks et al. 1979:149).

Information recovered as a result of excavation at the Bluestone Site complex challenges Dorwin et al.'s (1970:139) scenario, developed as a result of research in the Cave Run Reservoir area, that open lowland Late Archaic sites were temporary specialized camps, since RO35 and RO36 provide evidence that Late Archaic open lowland sites were more substantial base camps. Brooks et al. (1979:156-157) suggest on the basis of their research at Bluestone that a unilineal trend toward greater sedentism from Archaic to Woodland may be incorrect, and that perhaps in some areas, Late Archaic adaptations may have permitted degrees of sedentism which rivaled those of Woodland adaptations.

Brooks et al. (1979) compared the Bluestone Site complex to two other Late Archaic Eastern Mountain sites: Zilpo (BH37) and Seldon Skidmore (PO17). Large quantities of fire-cracked rock indicated the possibility of hot rock cooking at Zilpo (Rolingson and Rodeffer 1968b:36). Midden deposits and one feature were excavated. Cogswell Stemmed and Cave Run Stemmed projectile points, scrapers, and flakes were recovered. Rolingson and Rodeffer (1968b) characterized the Zilpo Site as a Late Archaic/Early Woodland camp or series of camps, occupied by a hunting and gathering group. Based on his investigations at the site, Marquardt (1970:36)

perceived the lack of grinding implements at the site as evidence of hunting with little dependence on wild plants, or perhaps of a special usage camp of unknown function. In the Early Woodland component, a few Johnson Plain sherds were recovered. Brooks et al. (1979:128) noted that while Zilpo was characterized as a Late Archaic/Early Woodland site, it was more similar to Early Woodland sites. Materials similar to those found at Zilpo were found at MO1, the Mullins Site in Morgan County (Rolingson and Rodeffer 1968a).

The Seldon Skidmore Site (PO17) is a Late Archaic site located on a high terrace in a broad bend in the Red River. Cowan (1976) defined two Archaic zones (B and C) and one Woodland zone (A) and noted the almost "textbook" stratigraphy at the site. Features such as hearths, trash-filled pits or depressions, piles of fire-cracked rock and earthovens were encountered. While the heaviest deposits occurred in Zone C, few diagnostics were recovered. Of those points which were recovered, Cowan (1976:69) noted a similarity to Brewerton-like materials recovered from Late Archaic contexts in southern Ohio.

Zone B contained a number of diagnostic points which resembled Lamoka Stemmed, Brewerton Side Notched, and Merom-Trimble points of the Riverton culture. In Zone A, limestone-tempered plain ceramics were recovered that did not resemble other regional Early Woodland ceramics (Cowan 1976:71). A fragment of a Cogswell point was found in association with the limestone-tempered ceramics. At Zilpo, Cogswell points were found with sandstone-tempered pottery. The presence of pottery in Zone A suggests an Early Woodland date for this zone. Brooks et al. (1979:129) noted a number of similarities between the Seldon Skidmore Site and the Bluestone Site complex.

Cowan includes Lamoka, Brewerton, and Riverton points in his projectile point cluster for the Late Archaic in the Red River Gorge. In this area, Cowan (1976:126) also identified a trend in Late Archaic points which indicated that the Late Archaic inhabitants in the Gorge area were participating in a recognized trend in eastern North America Late Archaic projectile point styles: the use of small notched or expanding stemmed projectile points, followed by the use of larger and more broad-bladed dart points.

Purrington (1967a) characterized the earliest occupation at the Combs Site (KT6), located at the junction of Irishman Creek and Carr Fork on a narrow residual terrace, as an Archaic component due to the lack of ceramics, presence of possible windbreaks, and lack of evidence for horticulture. A radiocarbon date of 1550 +/- 110 B.C. (I-2552) was recovered from feature context (Purrington 1967a:138),and he labeled this earliest occupation the Combs Phase. Although

no diagnostics were associated with the date, it appears that the site was occupied during the Late Archaic. Two Late Archaic campsites adjacent to the Licking River were documented by Marquardt (1970).

Dunnell's (1972) pre-ceramic Slone Phase at Fishtrap Reservoir in Pike County is generally assigned to the Late Archaic. Important Slone phase sites include PI11, PI16, and PI17. Dunnell (1966a:6-7) described important characteristics of the Slone Phase as the absence of substantial dwellings, and sites which were specialized, seasonal camps. Subsistence activities emphasized gathering, and various groundstone tools recovered from sites assigned to this phase were inferred to have been used in food preparation. Stone cooking vessels and the use of ironstone as the raw material for chipped stone tool manufacture were additional aspects of Slone Phase material culture. An averaged radiocarbon date of 1890 +/-120 B.C. has been assigned to this phase (Dunnell 1966a:7).

An important undisturbed Late Archaic rockshelter in McCreary County (McY28) was tested by Ison and Sorensen (1979). Two types of cultural features were defined: hearths, and shallow basins suggestive of hot rock cooking. Chipped stone tools, groundstone, and faunal materials recovered from the site indicated that this rockshelter was seasonally re-occupied by small bands of Late Archaic peoples during the fall and winter (Ison and Sorensen 1979:32).

As previously mentioned, plant domestication was an important factor in Late Archaic cultural development. Recent research at Cloudsplitter Rockshelter has documented early plant domestication in the Eastern Mountains. Dessicated squash rind was found in a Late Archaic deposit at Cloudsplitter associated with a radiocarbon date of 3728 +/-80 B.P. (1778 +/-80 B.C.)(UCLA 2313-K)(Cowan et al. 1981:71). Seeds of the Eastern Agricultural complex (sunflower, sumpweed, maygrass,and erect knotweed) are sparse in the Late Archaic levels in the site, but after 3000 B.P. (1050 B.C.), all members of the Eastern Agricultural complex underwent a

> sudden and dramatic increase in the rate at which they were being deposited in the site, perhaps indicative of a wholesale introduction of the complex into the region at this time. The Late Archaic and Early Woodland inhabitants of Cloudsplitter seem to have followed a similar trajectory in cultivated plant usage experienced in several other river drainages in the East (Cowan et al. 1981:71).

The data from Cloudsplitter Rockshelter suggest that squash may not have diffused into the East or Southwest from Mexico as previously postulated by Struever and Vickery (1973), but that it may have evolved *in situ* from North American stock (Cowan et al. 1981:71). Other as-yet-undiscovered rockshelter sites in eastern Kentucky may also have the potential to shed light on this important research question.

An important rockshelter in Johnson County was intermittently utilized as a way station for intensive, carefully scheduled seasonal exploitation of upland flora and fauna during the Late Archaic/Early Woodland (Fitzgibbons et al. 1977:47). Sparks Rockshelter (JO19) has a series of radiocarbon dates which range from 2340 +/-210 B.C. (SI-3166) to 860 +/-70 B.C. (SI-3167), although its heaviest period of occupation was from 1700-800 B.C. Corner- and side-notched projectile points, a steatite sherd, and a single sandstone-tempered sherd were recovered. The presence of squash was documented at Sparks Rockshelter, dating to around 800 B.C., which demonstrates the degree to which domesticates spread and pervaded the subsistence strategies of the peoples inhabiting the area (Adovasio and Johnson 1981:77). It should be noted, however, that this date is suspect since domestic pig bone was recovered from the same stratum as the squash seeds (C. Wesley Cowan, personal communication). Nevertheless, information recovered at Sparks supports the contention that the lifeways of the Late Archaic peoples continued into the Early Woodland sub-period relatively unchanged.

During the Archaic, cultures became more varied, as each group tailored its own brand of subsistence strategy for maximum exploitation of locally available resources. Hunting, fishing, and plant food processing activities carried out in a seasonal round pattern of exploitation appears to characterize Late Archaic subsistence strategies in the Eastern Mountains. This strategy appears to have continued into the Woodland Period. Data from eastern Kentucky hold the potential for investigating the development of horticulture in eastern North America, as well as other important Archaic Period research topics.

3. The Woodland Period (1000 B.C.- A.D. 900)

The Woodland Period witnessed the continuation and elaboration of cultural practices which began during the Late Archaic. People became increasingly dependent on the cultivation of plant foods for subsistence, and developed a sedentary lifestyle. Except for the latter part of the Late Woodland, Woodland Period subsistence practices remained similar to Archaic subsistence patterns, combining hunting,

plant food gathering, and fishing in a seasonal round exploitation pattern.

The Woodland Period is customarily divided into three sub-periods: Early (1000 B.C.-200 B.C.), Middle (200 B.C.-A.D. 400) and Late (A.D. 400-A.D. 900). Throughout the Woodland Period, however, archeologists can document a steadily increasing exploitation of cultivated plant resources. At some point in this period, what had been "initially one of many procurement systems in a varied hunting and gathering economy" (Raab et al. n.d.:23) began to increase in importance, until the latter part of the Late Woodland, horticultural practices constituted the major subsistence practice for most of the cultures in the area. Raab et al. (n.d.:23) described this development as a series of cause-and-effect relationships:

> The productivity of horticulture as a food resource may have fueled population increase and sedentism. These changes in turn may have acted systemically to reinforce a dependence on horticulture. The result may have been a directional trend toward population growth, shift in settlement patterns, increasing social complexity, and technological change.

Mounds for burial of the dead became part of local religious behavior for the Adena and Hopewell cultures during the Middle Woodland sub-period. Mortuary ritualism became increasingly elaborate, and differences in the treatment of the dead implies that the once egalitarian hunting and gathering societies were developing greater social inequalities. Evidence from the C and O Mounds in eastern Kentucky indicates that this treatment was not reserved solely for adults (Blakeman 1971a:14), but whether such status was due to wealth, religious position, or position within the kinship system has not been determined. The socio-religious organization implied by the existence of these burial mounds indicates a distinctive cultural step away from the lifeways of the previous periods. Raw materials from foreign sources recovered from burial contexts attest to the operation of inter-regional trading and exchange networks.

Not all people participated in the Middle Woodland burial mound cultures, and many aspects of Woodland material culture remained quite similar to the previous period. Use of groundstone artifacts such as axes, adzes, and plant preparation artifacts such as nutting stones are found in Woodland contexts, as are bone and shell artifacts. Woodland projectile points include medium to rather large stemmed and notched points, but in the Late Woodland, small, triangular projectile points make their appearance in the material culture inventories. From the appearance of these

points, archeologists have inferred that the bow and arrow came into use in the Late Woodland sub-period.

The trait most often used to identify Woodland Period sites is the presence of pottery. However, it now appears that the presence of ceramics is simply a convenient trait for archeological use, and almost the only trait which can be cited to differentiate between Late Archaic peoples and the earliest Woodland groups. As Dragoo (1976:16) writes:

> The once seemingly clear division between the two periods does not exist, since continuity can be demonstrated in all the previously discussed Archaic traditions. Traits once believed to be indicative of the Early Woodland period can now be shown to have long histories in the Archaic. The only obvious criterion for distinguishing terminal Archaic complexes from the Early Woodland is the addition of ceramics to the latter.

An example from eastern Kentucky illustrates Dragoo's point. While Dunnell's phase formulation for Fishtrap Reservoir in Pike County has been criticized for its narrow focus, (Maslowski 1980:10; Gatus 1981:134-136), he has designated the Sim's Creek Phase, which includes ceramics as a diagnostic trait, as belonging to the Archaic cultural tradition because he cannot document any apparent change in subsistence activities from the pre-ceramic Slone Phase. Speaking strictly from a chronological point of view, however, the Sims' Creek Phase is a Woodland Period phase.

The Early Woodland sub-period is difficult to characterize, due in part to problems associated with the temporal placement of the Adena culture. Early Woodland subsistence was probably an extension of the subsistence practices defined for the Late Archaic. It is quite possible that a number of sites assigned to the Late Archaic are in fact Early Woodland sites which simply lack ceramics. This is an important problem which deserves increased research attention.

Early Woodland ceramics were generally thick and crude. The earliest ceramics located at Dameron Rockshelter (JO23A) in Johnson County were dated to around 1070 B.C. (Vento et al. 1980:187) and were sandstone-tempered. Early Woodland ceramics in Pike County have been recovered that were tempered with quartz (Dunnell 1972). A great deal of research must be conducted towards identifying Early Woodland material culture inventories.

The Hall Shelter (PE8) in Perry County is a stratified site which has been described as a seasonally occupied Woodland campsite (Gatus 1981). Ceramics were mainly limestone-tempered, and a number of different projectile

point forms were recovered. The lack of sufficient numbers of diagnostic artifacts prevented the author from assigning the occupation of this shelter to any Woodland subperiod, although radiocarbon dates of 1780 +/-160 B.C. (SFU83), 1230 +/-120 (SFU88) B.C., and 2320 +/-150 B.C. (SFU84) indicate a possible Late Archaic/Early Woodland temporal placement (Gatus 1981:145).

An open Early Woodland site (ES19) located in Estill County during a transmission line survey (Ison and Boisvert 1981) was identified by the presence of a Cogswell-like projectile point and limestone-tempered pottery. Heavy lithic debris, well-preserved faunal material, fire-cracked rock, and dark soil marked this as an extremely important site, due to the fact that most Woodland Period sites in this area are located in rockshelters (Ison and Boisvert 1981:96). An Early Woodland campsite, LA176, has also been recorded in Lawrence County (Cinadr and Maslowski 1979).

During the Woodland Period, distinctive cultures developed which have been defined from burial mound contexts. The earliest of these cultures is Adena. Once considered chiefly an Early Woodland sub-period manifestation, a more recent re-evaluation of Adena has led Clay (personal communication 1982) to place this culture in the early part of the Middle Woodland sub-period, overlapping to some degree with the earliest Hopewellian materials. Clay bases this hypothesis on the recurring pattern of 400 B.C.-200 A.D. radiocarbon dates for Adena sites.

The Adena culture existed in a large area along the middle and upper Ohio River in parts of southwestern Pennsylvania, north and western West Virginia, southern and central Ohio, southeastern Indiana, and central and northeastern Kentucky (Dragoo 1963:177). Little is known about the settlement and subsistence patterns of the Adena people since most research on Adena has focused on mounds. Houses encountered below mounds consist of circular structures with outward leaning singular or paired posthole patterns, indicating that the Adena were sedentary for at least a portion of the year. An alternative explanation of these houses, however, is that they represent the remains of ceremonial rather than habitation structures (Clay 1982).

Our most complete knowledge of Adena culture concerns their mortuary customs and associated artifacts recovered from burial mound contexts. Burials were placed in conical mounds as extended inhumations or cremations. Through time, burial practices developed from simple pit interment to burial in log tombs, and eventually to burial in rectangular, log-lined tombs beneath a structure, possibly a charnel house (Dragoo 1963:205-207). Development has also been noted in diagnostic projectile point and ceramic styles:

Robbins leaf-shaped blades replaced Adena and Cresap leaf-shaped blades; Adena Plain and Montgomery Incized ceramics replaced Fayette Thick (Dragoo 1963:205-207). With burial elaboration came the increased occurrence of exotic artifacts of a non-utilitarian, non-local nature, which suggests the increasing importance of long-range trade and exchange of these raw and finished materials and objects. Artifacts include objects of cut mica, copper bracelets and finger rings, engraved stone tablets, stone gorgets, pendants, and pipes (Dragoo 1963:208). Increasing burial elaboration and the importance of long-range trade networks indicates that social stratification of aboriginal populations may have occurred at this time.

The Adena culture is expressed best in the Kentucky Bluegrass, where mound sites such as the Morgan Stone Mound in Bath County (Webb 1941a), the Wright Mounds in Montgomery County (Webb 1940), and the Drake Mound in Fayette County (Webb 1941b),have been investigated. The Morgan Stone Mound (BH15) in western Bath County was a single conical Adena burial mound (Webb 1941a). Seven extended burials were located in the mound, although Burial 6 was apparently the most important burial, as indicated by its central position and its location within a log tomb within a circular structure. Adena Plain and Montgomery Incized vessels were included as grave goods. Textiles and shell beads were also recovered. A radiocarbon date of 150 B.C. +/- 140 (M-2240) was obtained from this circular paired-post structure, and dates the initial use of the site for burial purposes (Crane and Griffin 1972:160).

Adena mounds are located in the Eastern Mountains region, but appear to be restricted to the lower Levisa Fork drainage (Purrington 1972). Adena burial mounds have been documented in Johnson County, for Dewey Reservoir in Floyd County, in Lawrence County and along the Big Sandy near Ashland, but no Adena mounds are known for the Kentucky or Licking Drainages (Purrington 1972:8).

One group of eastern Kentucky Adena mounds was investigated by Webb (1942). The C and O Mounds (JO2 and JO9), located in Johnson County along the Levisa Fork, were characterized as single component, late Adena Robbins complex sites. The remains of circular, paired-post structures were encountered below both mounds. Two important Woodland ceramic types were defined for eastern Kentucky as a result of this work: Johnson Plain and Levisa Cordmarked (Haag 1942:341-349).

Purrington's (1972) recent re-analysis of the C and O Mounds materials takes issue with Webb's characterization of them as single component sites. Purrington compares the two sites by examining features of mound construction and method of burial, types of burial offerings, and attributes of both

lithic and ceramic assemblages. He concludes that while both mounds exhibit some traits which could place them in a late Adena Robbins complex, significant intra-site differences exist (Purrington 1972:6). Purrington indicates that the bulk of the JO2 materials are much more similar to those recovered from Peter Village in Fayette County, an early Adena complex reflecting an amalgamation of Adena and local Archaic traits (Purrington 1972:7). Materials from JO9 on the other hand, indicate an almost "pure" Adena assemblage closely conforming to materials recovered from the late Adena Wright Mound in Montgomery County (Purrington 1972:7).

In the Eastern Mountains region, Adena cultural remains have also been recovered from rockshelters in Wolfe, Powell, Lee and Menifee counties (Funkhouser and Webb 1929, 1930). They pointed to the grit-tempered ceramics, Adena points, and/or leaf-shaped blades as evidence for the occupation of these rockshelters by Adena peoples. To account for the existence of Adena-like materials in the rockshelters, Webb and Baby (1957) proposed that the Adena peoples who built the mounds in the Bluegrass region moved to the eastern Kentucky rockshelters during the fall and winter.

Recent work in the rockshelters of the Eastern Mountains has led other investigators to question Webb and Baby's hypothesis. Studies of rockshelter botanical remains indicate spring-summer, as well as fall-winter, occupation. Purrington's (1967b) re-analysis of ceramics recovered from shelters excavated by Webb and Funkhouser indicated that a clear difference existed between the ceramic traditions of the Bluegrass Adena and the rockshelter "Adena." Rather than actual movement of peoples, it is more likely that local rockshelter inhabitants were influenced by the Adena culture (Hanson 1964a:49).

On the basis of his work, Purrington (1967b:147) saw no evidence of a local Adena development in eastern Kentucky. He sees the Adena tradition as a short-lived, intrusive phenomenon, and the reasons for its disappearance from the area are unknown. More research concerning the Adena cultural manifestation in the Eastern Mountains needs to be conducted, before any clear understanding of its development in the region can be discussed.

In the Middle Woodland, beginning around 200 B.C. in some areas, a change in settlement patterns, elaboration of burial complexes, evidence of social stratification, and population increase marked the beginning of Hopewell in various areas of the Midwest and Southeast (Dragoo 1976:18). The impetus for these changes has been interpreted as a greatly improved economy, made possible by the addition of horticulture (Yarnell 1964:148).

Hopewell cultural manifestations (cf., Brose and Greber 1979) appear in their most classic form in Illinois (Havanna Tradition) and in Ohio (Scioto Tradition), although the nature of the relationship between the two is still not defined. Hopewell culture's improved economic base led to an expansion of population and an increase in socio-cultural complexity, which seems to have given rise to a ranked society (Dragoo 1976:18). Burial mounds were larger than Adena mounds and earthworks which enclosed these mounds defined ceremonial centers. Examples include Hopewell, the Portsmouth Earthworks, and the Marietta Earthworks in Ohio.

Elaborate tombs contained exotic raw materials and finished items (e.g., mica cut outs, copper ear spools, obsidian, marine shell, sharks teeth, and distinctive lamellar blades). The appearance of foreign trade goods indicated that the Hopewell elite had trade relationships and communication with distant groups. Streuver (1964) has termed this widespread sharing of distinctive artifact styles and mortuary customs "the Hopewellian interaction sphere." Ceramics distinctively decorated with dentate-stamped, rocker-stamped, and incised designs applied to distinctive forms, and similarly diagnostic corner-notched projectile points are found in Hopewellian contexts.

Hopewellian influence in the Eastern Mountains region can be characterized as minimal, due to the very small number of recorded sites that contain Hopewellian or Hopewellian-like materials. Sites in the Eastern Mountains with Hopewellian materials appear to be located along the Ohio River and in the extreme northeastern portions of the region. Site 15BD13 (15BD311), located in eastern Boyd County, is a Hopewell site, or one that was heavily influenced by Hopewellian culture (Schock and Foster 1976c:42). Two points from a cache were identified as Middle Woodland Bakers Creek projectile points. Artifacts from a disturbed grave included a pendant, a multi-grooved abrader, and a copper awl. Copper awls are occasionally found at Hopewellian or other Middle Woodland sites (Prufer 1965).

The Blanton Site (JO32) in Johnson County is a unique village site which may represent a Hopewellian trade center in the Big Sandy Drainage. Exotic items recovered include small lamellar blades, mica, and check-, simple-, and rocker-stamped pottery not found on other Woodland sites in the drainage. The presence of these materials indicates southeastern and Ohio Hopewell influence at the site (Cinadr and Maslowski 1979:12).

The Biggs Site (GP8) and Lower Shawneetown (GP15), located in Greenup County also contain Hopewellian components. The Biggs Site is a small mound encircled by a moat/earthworks complex, tentatively classified as a small ceremonial center which functioned primarily as a mortuary

site (Hardesty 1964). Four stages of building have been documented. A cremation burial with a fragment of cut mica, chipped chert nodules, a pipe, and quartzite-hematite tempered cordmarked ceramics with Hopewellian rim treatment suggest a late Hopewell or early post-Hopewell component at the site (Hardesty 1964:34). At Lower Shawneetown, the Hopewellian component has been identified by the presence of dentate- and rocker-stamped ceramics located in a feature with distinctive, cordmarked ceramics tempered with pebbles (Pollack, personal communication 1982). Old Fort Earthworks (GP1) in Greenup County, located not far from Lower Shawneetown,may be a Hopewellian earthworks.

Although investigations into the reasons why Hopewellian influence rarely appears at sites in the Eastern Mountains has not been conducted, it remains a very important research question. Understanding why Hopewellian influence was barely felt in the Eastern Mountains may provide valuable information about why it did occur elsewhere.

Around A.D. 400, the Hopewellian ceremonial centers and extensive trade network collapsed in the Ohio Valley, and burial practices became less complex. The decline of Hopewell marked the beginning of the Late Woodland sub-period. In areas such as Illinois or Ohio where Hopewellian influence was greatest, Late Woodland marks a return to a less complex way of life. However, in areas such as the Eastern Mountains, where Hopewellian influence was minimal, Late Woodland witnessed the continuation of a generalized Woodland lifestyle of an increasing dependence on domesticated plants, coupled with hunting and gathering.

Late Woodland artifact inventories are difficult to differentiate from assemblages which date to the Early or Middle Woodland sub-period that do not show Adena or Hopewellian cultural affiliation. During the Late Woodland, small triangular projectile points appear in artifact assemblages. The presence of triangular points is frequently used to infer that the bow and arrow came into use at this time. Other Late Woodland projectile point forms include Jacks Reef Corner Notched, Chesser, and Levanna points. While regional ceramic sequences have not been developed, most Late Woodland ceramics are generally cordmarked. Variability in ceramic tempering agents is thought to reflect regional and not temporal developments (Purrington 1967b:124). A number of Late Woodland phases have been defined in the areas surrounding eastern Kentucky: Newtown (Griffin 1952; Oehler 1973) Peters (Prufer and McKenzie 1966), Chesser (Prufer 1967), Watson Farm (Mayer-Oakes 1955). And while not all Late Woodland materials from the Eastern Mountains can be assigned to a phase, some can be assigned to the Newtown Phase.

Two sites in the Eastern Mountains have been assigned to the Late Woodland Newtown Phase on the basis of the occurrence of angular - shouldered cordmarked vessel fragments, a distinctly Newtown ceramic trait (Seaman 1980): Rogers Rockshelters (PO26 and PO27) and Haystack Rockshelters (PO47A and B). Radiocarbon dates ranging from A.D. 465+/-55 (UGa 553) to A.D. 705 +/-60 (UGa 750) were recovered from the Rogers Rockshelters (Cowan 1979:20). The Haystack Rockshelters were not dated chronometrically, but the similarity of the Haystack assemblage to the assemblage recovered from Rogers led Cowan (1979) to infer contemporeneity. Nuts, fruits, berries, and cultigens (squash, bottle gourd, sunflower), cordage, paleo-fecal material, worked bone and shell, as well as ceramic and lithic materials, were recovered from these sites. Cowan (1979:22) suggested that the Haystack Rockshelters were occupied from the middle-late summer through the fall and winter, and that the inhabitants preferred to exploit the lower slope or stream and river bank environments.

At Lower Shawneetown, one of the components of this multi-component site has been assigned to the Newtown Phase, based on the occurrence of cordmarked, angular-shouldered vessels (Henderson and Pollack 1982). Lower Shawneetown represents a Newtown habitation site where activity areas could be identified on the basis of the spatial distribution of features and ceramics. The northern site area exhibited mainly large, circular features, while the central area appeared to be devoid of almost any artifacts. A third area was defined as a habitiation area, due to the predominance of postmolds.

The great bulk of sites assigned to the Woodland Period in eastern Kentucky cannot be designated as Adena, Hopewell, or Newtown and must be relegated to a "generalized" Woodland category. Chronological sub-period designations do not have much utility, because diagnostic artifacts for these time segments in the Eastern Mountains have not been identified. The problem in eastern Kentucky resembles the problems Roper describes for the same time period in the Ozarks of Missouri:

> If we wish to classify the archaeological materials solely by time, then of course we can classify those from the Ozarks as Early, Middle or Late Woodland. If we wish to use stylistic traits to place them in sequence and equate them to Woodland taxa (phases, etc.), then it breaks down almost completely (Roper 1979b:9).

A number of surveys conducted over the past twenty years have located sites from which "Woodland" (i.e., non-shell-tempered) ceramics were recovered in the Eastern Mountains (Hanson 1964; Dunnell 1966a, Purrington 1966; Fryman 1967;

Dexter 1974, 1975; Cowan 1975, 1976; Fenwick 1976; Sanders 1976; Turnbow 1976; Cowan and Wilson 1977; Sanders and Gatus 1977; Wyss and Wyss 1977; Gatus and Sanders 1978; Jobe et al. 1980; Wilson and Finch 1980; Bartnik et al. 1981; Dugan et al. 1982). Due to the lack of diagnostic materials, however, their assignment to defined Woodland traditions such as Adena, or Hopewell is impossible. Without data from excavated stratified Woodland contexts, regional chronologies remain tenuous (cf Cowan 1976, Wyss and Wyss, 1977, Dunnell 1972, Purrington 1967a), and the development of regional Woodland complexes also becomes difficult. A great deal of research and synthesis remains to be conducted before a clear picture of the Eastern Mountains Woodland Period can be presented.

Blakeman (1971a:1-3) has cogently discussed the specific problems encountered in applying the designation "Woodland" to ceramic-using groups in the Eastern Mountains. He suggests the use of the term "formative" (after Willey and Phillips 1958) to define cultural manifestations such as Adena and Hopewell in the region. Defined in this manner, the presence of ceramics in an otherwise hunting and gathering (Archaic) material culture inventory does not signify a Woodland (or "formative") cultural tradition. Both Purrington's (1967b:147) and Blakeman's (1971a:15) statements that Archaic Period lifeways extended into the Late Prehistoric Period, contemporary with "formative" Woodland cultures (i.e., Adena, Hopewell) were made in recognition of the problem of defining Woodland in the Eastern Mountains.

Only a few broad statements can be made regarding the "generalized" Woodland sites identified from survey. They are located in rockshelter and open bottomland contexts. Cordmarked and plain ceramics predominate. A variety of tempering materials used throughout the period and in different regions dispels the notion that tempering materials underwent a unilineal replacement through time. A variety of projectile point styles have also been noted. The recovery of triangular projectile points in association with non-shell-tempered ceramics indicates that the bow and arrow came into use for hunting in the Woodland Period.

A few excavated Woodland sites deserve mention here. Dameron Rockshelter (JO23A) in Johnson County was intermittently occupied as a locus for aboriginal hunting, collecting, and food processing, probably from the late Early Woodland to Late Woodland (Vento et al.1980). No more precise Woodland cultural affiliation could be determined because the sandstone-tempered ceramics did not resemble the sandstone-tempered ceramics Haag (1942) described for the C and O Mounds. Woodland materials from Dameron Rockshelter appeared to be most closely related to Woodland artifact assemblages described for the middle Ohio Valley (Vento et

al. 1980:199).

A Woodland component with sandstone-tempered ceramics, triangular projectile points, and a radiocarbon date of A.D. 560 +/-60 is located at the Carroll Shelter in Carter County (Ison 1982:1). Similar instances of sandstone- or limestone-tempered ceramics associated with triangular projectile points radiocarbon dated to the Woodland Period have been documented at two sites tested in the Yatesville Reservoir. At LA32 (William Blankenship Rockshelter II) and LA45 (William Blankenship Rockshelter III), radiocarbon dates of 35 +/-80 B.C. (UGa 1326) and 335 +/-245 B.C. (UGa 1325) respectively were assigned to these components (Fenwick 1976).

At the only mound documented for the Yatesville Reservoir (LA17: Charles Thompson Mound), the occurrence of Levisa Cordmarked, Johnson Plain, and Watson Plain ceramics led Fenwick (1976) to designate the site as Woodland, although no diagnostic projectile points nor radiocarbon dates were recovered from the mound. At Craft Rockshelter (KT14), Purrington (1967a) differentiated the Craft I phase from the previously mentioned Combs phase based on the introduction of sandstone-tempered pottery. Higel (1967) defined two Woodland site complexes (CY17-19) and (OW 21-23) based on surface collections.

The dry rockshelters located in eastern Kentucky are a unique and valuable resource, rarely found in the Eastern Woodlands. They contain important information on the development of the use of cultigens during the Woodland Period, and afford a glimpse of the rich tradition of artifacts made from perishable materials such as wood, grasses, and skins, which are rarely preserved in open sites. This remarkable artifact preservation is due to two important factors: year-round dryness inside the shelter and presence of a high relative proportion of nitrates in the soil.

Funkhouser and Webb (1929) excavated a number of rockshelters in Lee County containing thick ash deposits. The ash beds contained burials and cremations, wood, leather, bark, twine, and textiles. The excavated remains of perishable artifacts such as split cane basket fragments, woven fiber slippers, matting, cordage, leather, and wooden tools have also been recovered from such sites as Hooten Hollow Rockshelter (MF10), Newt Kash (MF1), Haystack Rockshelters (PO 47 A and B), Rogers Rockshelters (PO 26-27). Paleo-feces and quids have also been discovered at some of these sites. Both Hooton Hollow Rockshelter and Newt Kash occupations have been interpreted as Early Woodland, due to characteristics of some of the floral materials recovered (Cowan 1979), and Haystack and Rogers rockshelters, as previously discussed, were occupied during

the Late Woodland (Cowan 1979). Volney Jones' (1936) description of vegetal materials from Newt Kash Shelter in Menifee County is a classic study of a preserved floral assemblage. Dessicated plant remains have also been recovered from survey sites described as Woodland: MF122, MF40, MF121A. The importance of rockshelters in this portion of eastern Kentucky and the information they can provide archeologists cannot be over-emphasized. Vandalism, however, has destroyed and continues to destroy these unique and priceless sites (Ison et al. 1980).

Stone mound sites identified in the Eastern Mountains have been attributed to Woodland Period cultures, although most have not been assigned to any sub-period, nor to any particular cultural affiliation. The Stone Serpent Mound (BD13) is an effigy mound site located in Boyd County. It is shaped like a coiled snake, and is situated on a bluff which overlooks the Big Sandy River. Although no artifacts have been recovered from the site,it is commonly regarded as an Adena or Hopewell mound, especially since effigy mound-building in surrounding areas has been attributed to these cultures (Brisbin 1976; Schock and Foster 1976c). Another stone mound site, BD306, was tested by Schock and Foster (1976c) and was dated to the Early Woodland on the basis of a 360+/-65 B.C. (UGa 869) radiocarbon date from a hearth encountered in a test pit. Three stone mound sites were recently tested in Estill and Lee counties (Ison et al. 1982). ES15 was defined as a prehistoric burial mound, even though only a few lithic artifacts were recovered (Ison et al. 1982:32).

Unique archeological resources that may be attributed to the Woodland Period are petroglyphs found on stones and sandstone rock faces. Documented for Powell County (Coy and Fuller 1971), these petroglyphs are primarily pecked into the stone, and range in execution from sophisticated, to linear and simple. Coy and Fuller (1971) also mention petroglyphs located in Clay County.

While a diversity of Woodland materials have been collected from the Eastern Mountains, the data indicate that major Adena or Hopewellian occupations probably did not occur. The incorporation of the use of cultigens into extensive foraging, hunting and gathering lifestyle appears to have existed during much of the Woodland Period in the Eastern Mountains, and the lifestyle of the majority of the people who lived in eastern Kentucky appears to have been little affected by either Adena or Hopewellian influence from other areas.

That which Roper (1979b) has described for the Ozarks during the Woodland Period may have also occurred in the Eastern Mountains during the Woodland. That is to say, the peoples who lived in the Eastern Mountains during the

Woodland Period, although aware of the changes going on elsewhere, did not participate in these cultural activities, perhaps because it was beyond their means, i.e., subsistence base (Roper 1979b:11). Thus, traditions persisted with little change for long periods of time in areas such as the Ozarks (Roper 1979b:11) and eastern Kentucky. This does not mean that change did not occur during the Woodland Period in eastern Kentucky. Through time, evidence suggests that Woodland peoples' lifestyle in general became increasingly sedentary, and that the people increasingly incorporated the use of domesticated plants as a subsistence resource.

Roper (1979b:11-12) has also questioned the appropriateness of considering Woodland developments in the Ozarks (Eastern Mountains) marginal:

> Rather than see them as marginal to Woodland developments, I would argue that essentially they are what Woodland is all about. Rather than being the exception to the rule, I would argue that those areas where Hopewell are prominent are the exception.

Eastern Kentucky's archeological record provides an enormous potential for Woodland Period research. Examination of aspects of cultural stability and conservatism could provide valuable insight into the dynamics of culture change. Additionally, dry rockshelter materials can provide important data concerning the use of plants as food and raw materials, prehistoric diet, and paleo-climate.

4. The Late Prehistoric Period (A.D. 900-A.D. 1650)

This period witnessed the increased importance of horticulture in the subsistence activities of native populations as well as an increased cultural complexity. Two cultural traditions have been identified for the Eastern Mountains during the Late Prehistoric Period: Mississippian and Fort Ancient.

Mississippian cultures embody the climax of prehistoric Indian culture in eastern North America. The earliest Mississippian manifestations have been documented in the lower Mississippi Valley, but by A.D. 800-A.D. 900, these cultures were firmly entrenched in the central Mississippi Valley and had penetrated considerable distances up the Ohio and Missouri drainages (Dragoo 1976:20). A more intensive, sedentary subsistence strategy was based primarily on the cultivation of maize, although hunting mammals and birds, fishing, and some plant food gathering continued to be practiced. This type of subsistence replaced the more extensive, hunting and gathering/incipient horticulture

seasonal round subsistence strategy of the Woodland Period.

Permanent settlements became common, but there was a range in site size , which points to the beginning of a settlement hierarchy with local, regional, and inter-regional centers. Site types include villages with domestic structures, stone box grave cemeteries, isolated farmsteads, and regional ceremonial centers such as Cahokia in the American Bottom (Fowler 1978), Kincaid (Cole et al. 1951) and Angel (Black 1967). Flat-topped earthen temple mounds were erected at regional centers or towns, the mounds signifying the site's relative importance in the settlement system. Social stratification and sharp class differences are suggested by variability in burial practices. All these aspects of Mississippian culture imply a fairly powerful, centralized political authority, which has led some investigators to suggest that Mississippian culture was a ranked society at a chiefdom level of political organization (Muller 1978:272). Distinctive artifacts include shell-tempered ceramics and small, triangular projectile points.

Mississippian sites in the Eastern Mountains region are located mainly in the Upper Cumberland drainage. Dorwin (1970) tested a Mississippian mound in Bell County, where he noted two stages of construction. Ceramics in association with the primary construction phase indicated that it was built between A.D. 800 and A.D. 1200. The second construction phase occurred soon afterwards (Dorwin 1970:3). Hockensmith (1980) has identified two Mississippian sites in Knox County: KX10, a village, and KX24, a village and mound. Five Mississippian sites were identified during survey for the Wolf Creek Dam (Haag 1947). One of these sites, the Rowena Site (RU10),was tested in 1949.

The Rowena Site was described as a small Mississippian regional center, possibly occupied from A.D. 1300-1400 based on similarities to ceramic assemblages recovered elsewhere (Weinland 1980:133). The Rowena Site artifact assemblage indicates the site was strongly influenced by eastern Tennessee cultures throughout most of its history, especially the Dallas cultures of the Little Tennessee drainage (Weinland 1980:131).

Pisgah, a Mississippian cultural manifestation documented in the southern Appalachian region, occurs mainly in North Carolina, although isolated sites have been recorded for eastern Tennessee and South Carolina (Dickens 1978). Pisgah settlement featured large, nucleated villages with palisades, platform mounds, ceremonial earth lodges, and rectangular or square houses. Smaller settlements surrounded the larger villages, and may have been linked economically, politically, socially, or ceremonially to the larger villages (Dickens 1978:135). Pisgah sites can be recognized by the occurrence of distinctive ceramics.

Pisgah influence appears to have extended into southeastern Kentucky. Four sites on the northern side of Pine Mountain have been assigned to the Pisgah culture. One rockshelter with Pisgah ceramics and projectile points has been identified in Letcher County (Schock 1977b), and Pisgah ceramics were also recovered by an amateur from a Bell County rockshelter (Gatus 1981:41). Pisgah or Pisgah-like ceramics have been mentioned by other investigators at sites in Knox, Bell, Harlan, and Perry counties (Schock 1977b; DeLorenze and Weinland 1980; Purrington 1967b).

Foster and Schock (1972) have documented what may be a Pisgah Phase site in Harlan County. Excavation revealed a roughly square, semi-subterranean house with rounded corners (Schock 1977b). A bell-shaped storage pit, Pisgah ceramics, and triangular projectile points were recovered. Radiocarbon dates of A.D. 1345+/-120 (UGa 1139) and A.D. 1355 +/-90 (UGa 1140) were recovered from a burned portion of the roof of the house (Schock 1977b). Clearly, more research must be directed at this area of the Eastern Mountains, in order to understand the nature of the interface between the Mississippian and Pisgah traditions, as well as how these Mississippian cultures interfaced with the middle Ohio River Valley Mississippian manifestation, Fort Ancient.

The late prehistoric archeological complex of the central Ohio Valley is Fort Ancient, which spans the time from approximately A.D. 1000 to about A.D. 1700. Geographically, Fort Ancient extends from western West Virginia to southeastern Indiana and from south-central Ohio to north-central and northeastern Kentucky (Griffin 1978:551).

The development of Fort Ancient and its relationship to Late Woodland cultures has been and continues to be a hotly debated issue. Two hypotheses have been offered in explanation for the relationship between Fort Ancient and Late Woodland cultures. One hypothesis suggests that Fort Ancient represents the florescence of an indigenous Late Woodland culture (Graybill 1980:55-56; Rafferty 1974). Ceramic data from sites in the Red River Gorge with mixed limestone- and shell- tempered ceramics would support this statement (Cowan 1976:129). Others suggest that Fort Ancient represents an influx of Mississippian peoples from the lower Ohio River Valley (Essenpries 1978:154-155). Dunnell's (1972:71-72) Fishtrap data would support the migration hypothesis in part, since he viewed the Woodside Phase occupation as such an intrusion. In different areas, then, each of these hypotheses may be correct. However, Essenpries (1978) has gone on to suggest that these two hypotheses are appropriate for explaining Fort Ancient manifestations at different times during the Late Prehistoric Period. In this scenerio, Fort Ancient is viewed as a florescence of Mississippian-influenced Late Woodland culture during the early phases (Baum, Anderson,

and Feurt phases) and as an influx of Mississippian peoples during the later Madisonville Phase (Essenpreis 1978:164).

Other investigators argue that not all local Late Woodland groups chose to participate in or accept the Mississippian culture complex (horticulture and sedentism), and instead they continued to follow their Woodland way of life. The very few absolute dates from Fort Ancient sites and the almost complete lack of stratigraphic data and intersite comparative data contributes to the confusion (Griffin 1978:557), and these explanations must remain hypotheses.

Regardless of whether or not Fort Ancient developed out of an indigenous base, or whether it represents a population influx, it does reflect an elaboration of Late Woodland subsistence activities and social organization. Settlements were much more nucleated, as evidenced by large village sites (Dunnell 1972). These village sites tend to be located in valley bottoms. Smaller sites which may represent seasonal camps are found throughout tributary drainages. Some of the major sites along the Ohio River or close to it were fortified; many had central courtyards or plaza areas (Griffin 1978:552).

Fort Ancient peoples had an increased reliance on the cultivation of maize, coupled with beans and squash. And although horticulture was an important source of food, hunting was still pursued. Deer was the main meat source; at some sites it made up as much as 80% of the game consumed (Griffin 1978:552). More elaborate ceramic styles, usually tempered with shell, (although shell- and grit- tempered ceramics also occurred),triangular projectile points, mussel shell implements (knives, scrapers, hoes), stone pipes, and a diversified bone technology also serve to distinguish Fort Ancient cultures from Late Woodland cultures.

Although Fort Ancient subsistence was based on the cultivation of corn and other cultigens like the Mississippian cultures, other aspects of Fort Ancient clearly distinguish it from the contemporary Mississippian occupation of such sites as Angel (Black 1967) and Kincaid (Cole et al. 1951). Fort Ancient sites lack large ceremonial centers and earthworks. A complex settlement hierarchy such as that previously described for Mississippian cultures does not occur in Fort Ancient. Villages and hunting camps have been the only Fort Ancient site types defined.

As with the Archaic and Woodland periods, most sites assigned to the Late Prehistoric Period in the Eastern Mountains region have been located through survey. They are assigned to the Late Prehistoric Period based on the presence of seemingly diagnostic artifacts such as shell-

tempered pottery and triangular projectile points. However, the same problems discussed for sites assigned to the Woodland Period based on survey data exist for their Late Prehistoric counterparts. Temporal assignment based on diagnostics can be misleading, since triangular projectile points appear in the Late Woodland, and shell-tempered ceramics were made by both Mississippian and Fort Ancient peoples. While sand-tempered ceramics with distinctive surface treatments can generally be assigned to the Late Prehistoric Pisgah culture, plain surfaced sand tempered ceramics cannot be so assigned. Without more intensive work in the Eastern Mountains, cultural/subperiod designations must remain questionable for many of the sites located through survey.

Hoffman (1966:50-51) and Higel (1967:23-24) noted an absence of Fort Ancient/Mississippian materials in the Grayson Reservoir survey area (Carter and Elliot counties) and the Booneville Reservoir survey area (Clay and Owsley counties). Several factors may account for this apparent lack of materials: 1) the areas surveyed may not have adequately represented areas where settlement of this period occurred, 2) sites may have been buried under river alluvium, or 3) sites may actually not exist. More work needs to be conducted in the surrounding areas to confirm or refute Hoffman's and Higel's statements.

A number of excavated Fort Ancient sites in the Eastern Mountains region have not been assigned to any phase. Occupation at the Roberts Site (BH17), a Fort Ancient site located in Bath County, was described as a Fort Ancient variant, since site materials reflected an impermanent settlement with no planned village pattern or stockade, rather than the large, neucleated permanent occupations represented at other Fort Ancient villages (Rolingson and Rodeffer 1968a). Shell- and grit-tempered ceramics similar to Anderson Cordmarked were recovered (Rolingson and Rodeffer 1968a:43). Purrington (1978) agreed with their characterization of the settlement pattern in the Licking area, and suggested that the Roberts Site represented a localized Fort Ancient manifestation reflecting the absorption of ideas and traits from adjacent areas.

Purrington (1967a) described a large Fort Ancient village located on the first terrace above Line Fork, a tributary of the North Fork of the Kentucky River. The Crase Site (LR2) produced predominantly small triangular projectile points and shell-tempered cordmarked, plain, or roughened ceramics. Another Fort Ancient village site in this area was documented by Fryman et al. (1967:60-61).

A few sites in the Eastern Mountains region have been assigned to Fort Ancient phases. A site in Greenup County, Fullerton Field (GP3), has been assigned to the Feurt Phase,

which has been defined in southern Ohio (Griffin 1943). Working under salvage conditions, 17 burials were excavated and 16 were superficially inspected (Webb 1928). The similarity of burial practices led Webb and Funkhouser (1928:111) to assign GP3 to the Feurt Phase.

Two Fort Ancient phases which have been defined for eastern Kentucky include the Madisonville phase, which continues in the Ohio Valley until contact (A.D. 1750), and the Woodside Phase, which Dunnell (1972) described for the Fishtrap Reservoir in Pike County. Dunnell defined the Woodside Phase as a Cumberland Plateau Fort Ancient adaptation (Dunnell et al. 1971:5).

Madisonville Phase ceramics are shell-tempered, generally cordmarked or plain, and have handles. Salt pans are common. Shell gorgets found on these sites were probably made in eastern Tennessee (Griffin 1978:556), which indicates that Fort Ancient culture participated in extra-regional trade. Structures are rectangular and the lack of daub associated with them suggests that the walls were made of bark or thatch. Fragmentary evidence suggests that significant site differentiation occurred only during this phase (Essenpries 1978:159). Year-round village occupation has been demonstrated, but hunting stations were also used (Essenpries 1978:156). Recent research in Clark County has documented what appears to be one of these hunting stations or camps (Turnbow et al. 1983).

Important Madisonville sites excavated in northern Kentucky, include the Hardin Village Site (GP22) and Lower Shawneetown (GP15). Hanson (1966:172-173) estimated that occupation at Hardin Village extended from A.D. 1500 +/- 50 to A.D. 1675 +/- 5. This would place the occupation at this site very late in the Late Prehistoric Period, extending into the Contact Period. The Lower Shawneetown occupation has been dated A.D. 1751 to A.D. 1758 (Pollack and Henderson 1982:14), indicating that this site was occupied during Contact times. Lower Shawneetown will be discussed in more detail in the following section.

A substantial village occupation was documented at Hardin Village. Rectangular houses with rounded corners showed evidence of rebuilding, although the village plan could not be inferred from the excavation (Hanson 1966:16). Features included pits, fired areas,and charcoal deposits, as well as 301 burials. Most burials contained a single, extended individual, although partly flexed individuals were also encountered. Artifacts included shell-tempered ceramics and triangular projectile points, groundstone tools, and a varied inventory of bone and shell artifacts. Reworked brass and copper ornaments, recovered from extended burials only, argue for continued occupation at the site into the protohistoric. Hanson (1966:174-175) presents evidence

indicating that Hardin Village was occupied by the Shawnee.

Although no large, classic Fort Ancient villages have been reported in the Red River Gorge area, Fort Ancient materials have been recovered from a number of rockshelters in the region. Most rockshelters indicate affiliation with Madisonville Phase. These sites indicate short, repeated habitation, and Cowan (1976:131) suggests that they were used as specialized seasonal camps. The William S. Webb Memorial Rockshelter (MF32) is a single component Fort Ancient site with numerous hearths and pits, perishable items (fiber cordage, wood artifacts), and cultigens such as corn and canary grass. This site shows evidence of repeated occupancy by small groups (Cowan 1976:131) and may articulate within the Fort Ancient settlement pattern in the region as a seasonal, small group occupation site. Several valley floor sites attributed to Fort Ancient due to the presence of triangular projectile points and lack of ceramics are described as representing possibly hunting camps (Cowan 1976:131). Dameron Rockshelter, located in Johnson County, was also occupied during the Fort Ancient Madisonville Phase, dated at around A.D. 1390 +/-100 (SI-3690) (Vento et al. 1980:141).

The Woodside Phase defined by Dunnell (1972) at Fishtrap in southeastern Kentucky features a pattern of settlement in rectangular houses surrounding an open plaza, all enclosed by a stockade. Other sites were camps, almost entirely composed of lithic scatters, which Dunnell characterized as hunting camps.

Several important Woodside Phase sites were excavated in the reservoir. The Slone Site (PI11) featured at least two circular Fort Ancient villages with stockades, 12 houses,and a central plaza (Dunnell et al. 1971:4). Although the ceramics, projectile points and other kinds of artifacts, as well as features encountered at the Slone Site, had been previously reported from other Ohio Valley Fort Ancient sites, the particular configuration of these elements was unique to the Levisa drainage (Dunnell et al. 1971:98). It was for these reasons that the Woodside Phase was defined as a separate phase. In particular, the prominence of shell-tempered roughened ceramics suggested that Slone Site ceramics showed similarities to ceramic types defined in adjacent West Virginia and Virginia (Cowan 1976:79; Dunnell et al. 1971:98).

Four other localities at Fishtrap are closely similar to the Slone Site: PI8, PI10, PI13, PI15. They are similar in terms of not only distinctive ceramic styles and types of portable objects, but size, and shape of the community plan and burial type (Dunnell et al. 1971:4-5).

The Mayo Site (JO14) exhibited similarities to Woodside Phase sites (Cowan 1976:78) in terms of ceramic assemblage, site settlement organization, and other factors. This site was unfortified, and consisted of seven rectangular houses with associated pits and hearths arranged around a plaza. Excavated in 1939-1940, a formal report was never written, although several investigators have examined selected artifact categories from the site (Purrington 1967b; Blakeman 1971c:19-20). Radiocarbon dates (A.D. 890 +/-90 and A.D. 1150 +/-100) (RL 322 and RL 311, respectively) indicate the Mayo Site was occupied early in Dunnell's Woodside Phase (Tucek 1977:255-256).

A Fort Ancient village site tested in Lawrence County (Schock 1975) near the confluence of Tug Fork and Levisa Fork may share some similarities with the Fishtrap materials. Shell-tempered plain, cord-roughened, and fabric(?) impressed sherds were recovered from a feature which was radiocarbon dated A.D. 1270 +/- 135 and A.D. 1405 +/- 85. The Martin Site (PO42) is the only bottomland site which has been investigated in the Red River Gorge where Fort Ancient materials were concentrated in significant amounts. The site is a large camp located on a high terrace. Cowan (1976:130) compares the Martin Site ceramics to those recovered from the Mayo Site, suggesting that it was more closely affiliated with Woodside Phase.

While archeologists appear to know more about the Late Prehistoric cultures than any of the cultural periods discussed thus far, quite a number of basic questions remain unanswered. Eastern Kentucky is uniquely situated to provide information on the nature of the interface between Mississippian and Fort Ancient cultures, and Fort Ancient and Late Woodland cultures. Since the Fort Ancient culture existed until Contact in eastern Kentucky, the area can also provide important insight into the effects of Euroamerican contact on the aboriginal populations.

5. The Contact Period (A.D. 1650-A.D. 1800)

Available information about the Contact Period in the Eastern Mountains is limited to ethnohistoric documents, and a few sites which were investigated archeologically in the 1930's. Most of the information is focused along the Ohio River, since this was a major route of European exploration in the region. This discussion of the Contact Period will of necessity reflect this data focus. Although a certain amount of overlap with the following historical section is unavoidable, in this prehistoric section, the focus is on the Indian role in these historic events. The following discussion has been drawn primarily from Duffield et al. (1982).

In the preceding section, the late Fort Ancient Madisonville phase was described as lasting from A.D. 1200 to A.D.1750, well into the Contact Period. Because of this overlap, it has been suggested that the Madisonville Fort Ancient peoples were ancestral to various tribes mentioned as living in the area by the earliest European explorers, such as Marquette and Joliet, and La Salle (Margry 1876-1886). However, information is far from complete, and generally consists of names and places on maps that cannot be verified. Problems arise when attempting to assign tribal names to purely archeological cultures, and a 1:1 correspondence cannot be assumed. This problem is further complicated by either seasonal or annual population movements by the aboriginal inhabitants. As a result, different groups may have inhabited the same geographical localities during any given season or year.

The tribes reported to have lived in eastern Kentucky have been recorded as the "poorly known tribes of the Ohio Valley and interior"(Trigger 1978:ix). The Iroquois were known to have used Kentucky as hunting grounds, and the Cherokee or other southeastern tribes (i.e., Creeks, and Chickasaw) may have lived in the extreme southeastern counties of Kentucky (Wyss 1979:17). There is a possibility that Qualla phase (A.D. 1450-1500 to the 1800's) occupation tentatively identified as historic Cherokee may yet be documented in southeastern Kentucky (Dickens 1978). Qualla follows Pisgah in the Appalachian Summit area. The archeological evidence suggests that this area of the Eastern Mountains may have been culturally influenced by and more closely associated with, the southeast than with developments taking place in the Ohio River Valley. Because no Qualla Phase sites have been reported in the Upper Cumberland drainage area however (Dickens 1978:134), a discussion of Cherokee and other Southeastern tribal lifeways will not be included. With additional work in southeastern Kentucky, Qualla phase settlements may, nevertheless, be encountered.

Because the Shawnee are known to have inhabitied extreme northeastern Kentucky at least during the 1700's, investigators point to this group when searching for an ethnographic analogue for Fort Ancient Madisonville phase culture (Hanna 1911; Clark 1977; Griffin 1943; Whitthoft and Hunter 1955; Callender 1978). Their conclusions are drawn from a review of ethnohistoric, linguistic and archeological data. Voegelin-Wheeler (1974), however, dismisses the evidence that places the Shawnee in the area during the Late Prehistoric and Protohistoric Periods as inconclusive. She credits the Mosopelea (Voegelin-Wheeler 1974:203) as the ethnohistoric group which inhabited Fort Ancient Madisonville sites in the Ohio Valley.

Recent research at Lower Shawneetown (Pollack and Henderson 1982) has demonstrated that at this historically recorded Shawnee village, Madisonville Phase artifacts co-occurred with mid-eighteenth century Euroamerican trade goods, supporting the identity of at least some of the Madisonville Fort Ancient as Shawnee. However, additional research and investigation of the archeological, ethnohistoric and historic data is required to settle this question conclusively, with the proviso that it may never be fully answered.

The Shawnee are an Algonquian speaking group who had developed a subsistence based on horticulture (corn, beans, squash, pumpkins, sunflower), but which also included hunting, fishing, and gathering. The major ceremonial, political, and economic group was the village, and major rituals were conducted during the summer village occupation (Clark 1974:72). These rituals took the form of annual feasts and dances, connected with subsistence activities, especially horticulture (Clark 1974:90). The annual subsistence cycle began around the end of September, when the Shawnee left their towns to establish winter camps in sheltered valleys in order to hunt and trap game. In March, the Shawnee returned to their towns and planted in April. During the summer months, women tended the crops and gathered wild plants while the men hunted and fished (Callender 1978:624). Voegelin (1940:520) describes the Shawnee fields as being small, about one-eighth to one-fourth of an acre per person. Irrigation and fertilizer, except for ashes from field clearing were not used by the Shawnee (Clark 1974:85).

Traditional Shawnee towns were semi-permanent settlements, consisting of square or oblong bark-covered lodges which resembled Iroquois longhouses. The town nucleus had a large wooden structure used for town meetings and ritual and secular celebrations (Callender 1978:625). Sweathouses were also a fixed part of every Shawnee village (Clark 1974:145).

The increasing presence of European traders meant the Shawnee became increasingly dependent upon trade goods for basic utilitarian items. Eventually, the gun replaced the bow and arrow, and metal pots replaced native pottery. Still, many traditional items of native manufacture were used, either because they were unavailable from the whites or out of preference. Trade centered basically in skins and furs, and it has been suggested that trade was controlled by the village headman (Clark 1974:76). There is some indication that the Shawnee may have been salt traders (Clark 1974:77), and captive accounts describe Shawnee salt-making activities at the salt licks in central and eastern Kentucky (Hale 1931). Next to their many migrations, nothing about the Shawnee is so obvious as their

conservatism (Clark 1974:93). This conservatism is reflected in their burial practices, their housing, material culture, and their ritual and religious beliefs, all of which appears to have resisted change (Clark 1974:96)

Quite early in the Contact Period, European trade items were filtering into the area, either through established Indian trade networks, or possibly by direct movement of peoples to and from European-held territories. The Eastern Woodlands were honey-combed with Indian trails and paths that connected every habitable site with all others (Figure 7). Nearly all parts of the Eastern Woodlands were accessible via this extensive trail network (Clark 1974:150). "These trails were actually flow lines rather than single, well-defined roads" (Field 1977:13), which would follow the most level and direct routes depending on the time of year and the traveling conditions. Mountains and forests proved to be no obstacle for the Indians, and one glance at maps of these trail locations indicates how easily they contributed to trade and exchange across wide distances. It is assumed that European diseases also passed along these trade routes, contributing to regional depopulation.

A portion of the Warriors Path, the major north-south route from Lake Erie to St. Augustine, Florida, was located in eastern Kentucky. In Ohio, it followed the Scioto River to its mouth, where it crossed the Ohio River at Lower Shawneetown. This Shawnee village was the major gateway through which communications and migrations passed both north-south and east-west (Myer 1925:785). From Lower Shawneetown, the trail continued on to Blue Licks in Fleming County, to Eskippakithiki, and then through eastern Kentucky to the Cumberland Gap. From there the trail continued through Tennessee, North Carolina, and Georgia,ending at St. Augustine, Florida.

The Cumberland Trail led to the Kentucky River near Eskippakithiki (Clark 1974:155). A trail led from central Kentucky to the Big Sandy Trail. This trail followed Paint Creek to its mouth where it joined the Levisa Fork. From there, the trail crossed over the divide to the Tug Fork. A traveler could follow the Tug Fork north to Big Sandy, and then to the the Ohio River, or south to the headwaters of the Tug in Virginia, and then overland to the New River. The Great Tellico Trail had as its northern terminus the confluence of the Cumberland River and the Big South Fork near what is now Burnside, Kentucky. This major trade route is today U.S. Highway 27.

The earliest known Contact Period site in the Eastern Mountains is Hardin Village (Hanson 1966). This site was discussed in greater detail in the Late Prehistoric section. European trade goods on the site were primarily scraps of

1 Big Sandy - Burkes Garden — New River
2 Scioto Prong
3 Old Kentucky State Road
4 Warriors Path
5 Wilderness Trail
6 Tennessee — Fort Washington Road
7 Upper Blue Licks Prong
8 Big Bone — Blue Licks Trail
9 Licking Route
10 Buffalo Path
11 Falls of the Ohio — Lexington Road
12 Harrodsburg Trail
13 Cumberland — Great Lakes Trail

Figure 7. Indian and Early Frontier Trails in Eastern Kentucky

reworked brass or copper found in burial association.

The Iroquois Confederacy, located in the Northeast, was actively participating in the fur trade with the English early in the Contact Period. Because of their economic relationship with the English, the Iroquois had acquired the gun, and used it to their advantage in order to expand their own hunting territories and fur trade. According to historic documents, by the 1680's the indigenous populations of the central Ohio Valley had been devastated or evicted from the region by the Iroquois, leaving the territory largely abandoned except for small hunting or war parties. Presumably from the 1680's to the 1720's, no villages were established in this Iroquois-dominated region. The development of the idea that Kentucky had no permanent Indian residents (the Dark and Bloody Ground hypothesis) has been examined in detail by Schwartz (1967:9-11). Schwartz suggests that a combination of misinterpretation, the convenient picture the concept suggested, and an altered Indian settlement from prehistoric to contact times perpetuated this myth. "If Kentucky was indeed a Dark and Bloody Ground, it was the result of European influence on the Indian and occurred only during the historic period" (Schwartz 1967:11). However, Kentucky's abandonment cannot be confirmed or denied based on current data, since no sites dating to the late 1600's have been discovered.

Tribes believed to have been displaced by the wars begun by the Iroquois for control of the Great Lakes and Ohio Valley areas began to appear on the margins of European influence. For instance, the Shawnee were reported in Illinois, Alabama, and Maryland in the 1680's and 1690's (Clark 1977; Howard 1981; Callender 1978). These groups were deeply involved in the fur trade and in political and territorial disputes between the French and English. Concerned over Iroquois victories, the French began to nurture Indian allies and provide firearms to friendly tribes in an attempt to counteract the spread of pro-English Iroquois influence and the growth of English imperialism. Clark (1974:45) has suggested that although major Shawnee migrations began during these years, there is no reason to expect that all Shawnee villages were deserted and that eastern Kentucky was uninhabited at this time.

By the early 1700's, the Iroquois' claim to the Ohio hunting territory was being rejected by the French and ignored by any Indian group strong enough to do so. From the French-held north, the Miami and Wyandot moved into the Ohio Territory to establish villages by the 1720's. From the eastern frontier, English pressure for land in Pennsylvania and Maryland and inter-tribal conflicts caused the Shawnee and Delaware to move their villages to the Ohio River Valley. Small groups of Iroquois, primarily Seneca, also came and settled either in hamlets or in villages of

other tribes.

Also during the early 1700's, the Cherokee and Shawnee disputed land claims concerning the middle and upper Cumberland River, and conflicts occurred. By 1715, the Shawnee had been forced into central Kentucky and southern Ohio by the British-supported Chickasaw and Cherokee (Wyss 1979:17). In 1775, by the Treaty of Sycamore Shoals, the Cherokee sold their claim to an area bounded on the east and north by the Kentucky and Ohio Rivers and on the south by the Cumberland River to Richard Henderson's Transylvania Company (Wyss 1979:17). Areas south of the Cumberland River in present-day McCreary and Wayne counties remained in Cherokee control.

Following the re-occupation of the Ohio River Valley, both French and English traders moved into the region to compete for Indian business and to help maintain their country's claim to the territories. By this time, the European trader was no stranger to the Indian populations. Indian demand for European goods, in particular the gun, kettle, and knife, had resulted in Indian dependency on European suppliers. This dramatically altered their native way of life, and quietly eroded native self-sufficiency and self-reliance.

Lower Shawneetown, situated on both sides of the Ohio River in Scioto County, Ohio and Greenup County, Kentucky, was believed to have been inhabited in the 1730's. Apparently the principle village of the Shawnee, the site was reportedly also occupied by the Delaware, Iroquois, and Wyandot. It served as a focal point of the fur trade in this area in the 1740's and 1750's. Many French and English traders, explorers and surveyors visited the village during this period, and a trading post was believed to have been erected by Croghan on the Kentucky side of the Ohio (Hanna 1911).

As previously stated, materials recovered from the site on the Kentucky side indicate that this portion of Lower Shawneetown was occupied from A.D. 1751-1758 (Pollack and Henderson 1982). Refuse pits, corncob-filled postholes, burials, and possibly the remains of a structure were encountered at the site. Diagnostic aboriginal artifacts include shell-tempered cordmarked and plain ceramics and triangular projectile points, which resemble the diagnostic aboriginal artifacts recovered from Hardin Village. Lower Shawneetown is the latest Madisonville phase site documented for the area, which suggests continuity in the Fort Ancient Madisonville culture well into the Contact Period. In contrast to Hardin Village, European trade items recovered from Lower Shawneetown were found not only in burials, but also in general refuse pits and midden. These artifacts include gunparts (sideplate, rampipe, gunflints), glass

trade beads, metal cutlery, kettles, jews harps, and scissors (Pollack and Henderson 1982:6-7). Such artifacts reflect both French and English trade and the degree of culture change effected by their presence.

Contemporaneous with the Lower Shawneetown occupations, another Shawnee settlement known as Eskippakithiki was inhabited in present-day Clark County, Kentucky. Also known as Kenta-ke by the Iroquois, the village may be the namesake of the state (Hanna 1911). Although Eskippakithiki may have been occupied earlier by the Fort Ancient, it was definitely inhabited in the 1740's by pro-French Shawnee led by Peter Chartes. By A.D. 1752, however, the Shawnee had invited an English trader, John Finley, to establish a trading post at the site (Hanna 1911; Beckner 1932).

The French and later the English sent agents into the central Ohio Valley to strengthen each country's claim to the Ohio territory, and to solidify Indian allegiance to their respective nations. French explorers, Longueuil in 1739 and Celeron in 1749, passed down the Ohio River, stopping briefly at Lower Shawneetown. In response, the English sent Gist and Croghan to the region with messages. Realizing that both European nations claimed the region, the Indians were reluctant to become involved in their disputes. But as the territory became embroiled in the French and Indian Wars, many groups fought for the French, in part to halt the advance of English settlements. Due to the threat of English reprisal, the Shawnee abandoned their settlements on the Ohio, including Lower Shawneetown, in favor of safer locations on the Scioto River to the north (Hanna 1911).

After the French and Indian Wars, the English began to penetrate further into the Ohio Valley with ever-increasing speed. By the 1760's, Euroamerican hunters and surveyors had moved into Indian hunting territories in Kentucky, and settlements such as Harrodsburg and Boonesboro in the Bluegrass Region were established soon afterward. Seeing this encroachment into their land and the disruption of their economic base (i.e., the access to plentiful game for pelts and food), the Shawnee turned their attention from claims in marginal lands in southern Kentucky and the rival Cherokee to the Europeans who were settling their major hunting areas in Kentucky. The Indians living north of the Ohio River began to raid the Euroamerican settlements in a vain attempt to drive the whites from the Kentucky frontier (Callender 1978).

In retaliation, the Euroamericans destroyed Indian villages and crops, cut off trade of now essential goods, and eventually decimated the Indian population through ever increasing conflicts. The Treaty of Greenville signed in 1795 after the Battle of Fallen Timbers extinguished the last Indian claim to the land (Wyss and Wyss 1977:40).

However, hostilities between the Shawnee and the settlers continued until the Shawnee were defeated at the Battle of the Thames (during the War of 1812) on October 5, 1813 (Bartnik et al. 1980:18).

By the 1800's, the central Ohio Valley was firmly in English hands, and the Shawnee and other Indian tribes of the region relinquished their land and were moved west of the Mississippi River during President Jackson's Great Removal. Today, no Indian groups or reservations are located in eastern Kentucky. The Shawnee, now three separate groups, live in Oklahoma (Callender 1978).

Other Contact period sites are located in the Eastern Mountains, although their placement within the developments of the period is unclear at present. These include: GP20, a rockshelter located in Greenup County from which an English blade gunflint was recovered; Mudlick in Johnson County where a Shawnee village was supposedly located (Clark 1977); and a Shawnee-Cherokee winter camp site in Madison County (Hanna 1911). More Contact period research needs to be conducted in eastern Kentucky in order to increase our understanding of the peoples and the events which occurred during Kentucky's early history.

C. HISTORY BY ELLEN A. DUGAN [1]

1. Early Explorers and Settlers (A.D. 1650-A.D. 1780)

As discussed in the previous section, the Europeans who first visited the Eastern Mountains were explorers, trappers, traders, and surveyors which Ekhart (1967) vividly describes in his narrative of early frontier Kentucky. Gabriel Arthur, the earliest documented European to pass through eastern Kentucky, was a trader employed by Colonel Abraham Wood of Virginia. In 1674 while traveling with a group of Cherokee up the Kanawha Valley in West Virginia, Arthur was wounded and captured by the Shawnee during the Cherokee's attack on a Shawnee village. Arthur was later released by the Shawnees at Old Shawneetown on the Scioto River. He followed the Warrior's Path through eastern Kentucky, across the Cumberland Gap, and home to Virginia (Jillson 1934:50).

The first organized attempt at settling Kentucky came in the 1750's with the English Crown's schemes for colonizing the Ohio Valley. Land companies were developed in response

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1 (adapted from Dugan et al. 1982:30-42).

to the need for colonization. The Loyal Land Company was headed by Dr. Thomas Walker, a physician and surveyor. In 1750, he and a group of men entered Kentucky through the Cumberland Gap. They followed the Warrior's Path to Swan Pond, located below Barbourville in Knox County, where they built the first cabin in Kentucky. They returned to Flat Lick and traveled north up to the Red River. At this point they found a trail (in Wolfe County) which they followed east to an old Indian rendezvous at Mud Lick and Paint Lick (near Paintsville) in Johnson County and took the Big Sandy Trail home (Jillson 1934:52-53).

In 1751,Colonel Christopher Gist, exploring for the Ohio Land Company, swam his horse across the Ohio River at the mouth of the Scioto and entered Kentucky at the northern terminus of the Warrior's Path at Lower Shawneetown (Gp15). He turned west in search of the flat land described by fur traders and Indians. While moving toward the Falls of the Ohio he was warned of Indian attacks and turned southeast through Maysville. At Leestown he crossed the Kentucky River and followed Buffalo Path to a trail at Mount Sterling. This trail took him past the Red River in Wolfe County and then to the North Fork of the Kentucky River. Gist followed an old Indian trail through what is now Jackson, Hazard, and Whitesburg and finally across Pine Mountain and through Cumberland Gap (Jillson 1934:53-54).

John Finley, an Indian trader, is supposed to have made at least three trips to Kentucky. The first was in 1752, when he came upon the Falls of the Ohio. Following the river over to Big Bone Lick, in what is now Boone County, he met up with some Shawnee Indians who took him to Eskippakithiki (Cotterill 1917:46-47). One source claims that Finley married an Indian woman and lived with her at Eskippakithiki (Jillson 1934:52). While living at the Shawnee village, he traveled through eastern Kentucky. He returned home to the Yadkin Valley in 1753.

The French and Indian War, which began in 1754, interrupted further exploration and settlement in Kentucky for approximately fifteen years. In 1767 John Finley returned to Kentucky, presumably to the area around Eskippakithiki. Finley went back to the Yadkin settlement with more wonderful stories of the riches of the Kentucky country (Cotterill 1917:49-50). In the same year, Daniel Boone, hearing reports of the land and abundant game in Kentucky, set out with several companions across the mountains and reached the Big Sandy Valley in northeastern Kentucky. They spent the winter in Kentucky and then returned home, discouraged by the rough terrain in Floyd and Pike Counties (Kerr 1922:161).

In May 1769, John Finley and Daniel Boone, with four other companions - John Stewart, Joseph Holden, James

Mooney, and William Cool - once again set out for Kentucky. Finley guided them through the Cumberland Gap and supposedly brought them to the top of a mountain overlooking the Red River. They camped and hunted through the summer and then moved westward to the Kentucky River. There they explored the land between the Kentucky and Dick's (later Dix) rivers (Cotterill 1917). Boone and Stewart were captured once by Indians but managed to escape. On their return to the main camp they found that Squire Boone (Daniel's brother) and a companion, Alexander Neely, had joined the group. Stewart, Neely,and the Boones remained in Kentucky while the rest of the party returned to North Carolina, frightened by the threat of further Indian hostilities. Stewart was killed by the Indians soon after and Neely disappeared. The Boones continued hunting and trapping, avoiding the Indians. In May 1770, a lack of ammunition caused Squire Boone to return to North Carolina for more supplies. Daniel Boone stayed in the wilderness alone for three months until Squire returned (Cotterill 1917). Upon Squire's return, alarmed by increasing signs of Indians, he and Daniel moved westward and explored the Cumberland and Green River areas (Jillson 1934).

Between 1769-1770, a party of forty men from North Carolina and Virginia known as the "long hunters" crossed the Cumberland Gap and traveled to Flat Lick. They then followed the Cumberland River west until they came to the Big South Fork of the Cumberland, which they crossed. They stopped at a place called Price's Meadow (about six miles from Monticello in Wayne County) which had a good spring and decided to make it their base camp. The men separated into several groups, returning every five weeks to the camp at Price's Meadow. One group eventually followed the Cumberland to the Mississippi and down to the French Fort Natchez. Another group of the "long hunters", headed by James Knox, explored and hunted in the region around the Dick's and Greenrivers (Collins 1874; Cotterill 1917).

Some historians report that Daniel and Squire Boone met up with this group of "long hunters" near Greensburg, Green County (cf., Cotterill 1917:54) and remained with the "long hunters" until the spring of 1771. Collins (1874:258) states that though the two parties were in Kentucky at the same time, they never met. In either case, the Boones returned to North Carolina in the spring of 1771. On their way through the Cumberland Gap a group of Cherokees met them and took all the pelts they had accumulated (Jillson 1934). Knox and his party remained in Kentucky where their stores of pelts were repeatedly robbed by the Cherokees. They finally returned home in 1772 after having remained in Kentucky for two years, thus the name "long hunters."

In 1763, King George III of England had set aside the western region gained in the French and Indian War for the

Indians and English fur traders (Cotterill 1917). However, the colonists were not satisfied with this decree and began further exploration and plans for settlement in the west. The next group of men to explore Kentucky were professional surveyors.

In May 1773, under orders from Virginia's Governor Dunmore, Captain Bullitt, James Harrod, and a party of surveyors set out to survey bounty land in Kentucky for Virginia soldiers. They traveled down the Ohio River to the Falls and set out for the town of Louisville (Kerr 1922). In the same year, the three McAfee brothers - James, George, and Robert - traveled down the Kentucky River and surveyed the land around Frankfort.

In 1774, James Harrod returned to Kentucky with another group of surveyors who laid out a town. They erected a stockade at the head of the Salt River on June 16, 1774 and called it Harrod's Fort. The fort accommodated about 40 men (Jillson 1934). Meanwhile, in September 1773, Daniel Boone had decided to return to Kentucky with his family in the hope of starting a permanent settlement. He and six families were joined on their way by 40 men in Powell's Valley. An attack by the Shawnee Indians (in which Daniel's son James was killed) forced the settlers to return to the Clinch Valley to spend the winter (Cotterill 1917; Kerr 1922).

The threat of a new war with the Indians was quickly becoming a reality. The continual western movement of the American frontier was pushing the Indians further and further back. The new frontier in Kentucky became one of the places where the Indians decided to wage a war against the encroaching Americans. In response to continued Indian threats, Governor Dunmore made plans for two large campaigns against the Indians in the Ohio Valley. In order to warn the surveyors in Kentucky of the impending battles, Dunmore commissioned Daniel Boone and Michael Stoner in 1774 to travel into Kentucky, warn the surveyors, and lead them back to Virginia (Cotterill 1917). In a conflict known as Dunmore's War, the Indians, under the leadership of the Shawnee Chief, Cornstalk, were defeated. This had the effect of opening up Kentucky for permanent settlement (Kerr 1922).

In August 1774, Richard Henderson and four other men created the Louisa Company in order to purchase western lands from the Indians and begin settlements. In 1775, the name was changed to the Transylvania Company. Henderson had been negotiating with the Cherokee Indians for the purchase of Kentucky, offering the Indians "white man's goods" rather than gold for the land (Cotterill 1917:74). In March 1775, the Treaty of Sycamore Shoals was signed by Henderson and the Cherokee Indians at the Watauga settlement in eastern

Tennessee. Henderson purchased all the land south of the Ohio River between the Cumberland and Kentucky Rivers and all the land drained by the tributaries of the Cumberland. The total land involved was approximately three million acres (Kincaid 1947).

Daniel Boone was included in the negotiations with the Cherokee,and after the treaty was signed, Boone was to blaze a trail and lead the first settlers from the Watauga settlements to the new territory. This path became known as the Wilderness Trail. Boone and thirty men blazed the trail from the Watauga River in East Tennessee to Mocassin Gap, where it met old trails leading to Cumberland Gap. From Cumberland Gap it forded the river and followed it down to Flat Lick. Here, Boone left the main trail and followed an old buffalo trace to the Kentucky River. On the south side of the Kentucky River in Madison County a fort was built (Fort Boonesborough). The 200-mile Wilderness Trail was reportedly built in three weeks (Verhoeff 1911; Kincaid 1947). In 1778, the state of Virginia declared Henderson's claim null and void and instead granted him 200,000 acres of land in western Kentucky (Kerr 1922).

In spite of repeated Indian raids on the Kentucky settlers, new settlements continued to appear after 1776. Among the largest were Georgetown, Bardstown, Estill's Fort, Mount Sterling, Louisville, Lexington, and Maysville, centered mainly in the Bluegrass region.

2. Post-Revolutionary War (A.D. 1780- A.D. 1880)

After the end of the Revolutionary War and the threat of Indian attacks were over, movement of settlers into Kentucky increased. Treaties with Indians and the issuing of land grants opened the region up for colonization. Some of the early settlers in southeastern Kentucky were given land grants issued by the states of Virginia and North Carolina as payment for services in the Revolutionary War. By the end of 1784, the population of Kentucky had doubled its 1783 total from 12,000 to 24,000. In 1792, the population of Kentucky reached 100,000. This population was concentrated in the Bluegrass and consisted of rural communities.

Pioneer migration followed the old Indian trails. In eastern Kentucky, settlement was heaviest near the Wilderness Road, and stations were established at Williamsburg and elsewhere (Wyss 1979:22). Although settlement also occurred in the mountains along the roads that led to central Kentucky, the population in the Eastern Mountains in 1792 was still insignificant (Cotterill 1917:244). One of the reasons southeastern Kentucky was not settled as early as other areas in central Kentucky and

eastern Tennessee was due to the difficulty of traveling over mountain trails on foot, on horseback, and in Connestoga wagons. The pioneers preferred the Holston and Watauga settlements in eastern Tennessee and the Cumberland settlement in middle Tennessee because they were accessible by water route - a cheaper and easier route than traveling across the Cumberland Mountains.

The majority of the early settlers in the Upland South region were Scotch-Irish and German immigrants. Newton (1974) views the settlement expansion into lands west of the Allegheny-Appalachian mountains as a direct result of increased Scotch-Irish and German immigration into the United States. The earliest settlers in eastern Kentucky came from the eastern states of North Carolina, Virginia, and Pennsylvania. A distinctive mountain culture developed, based upon subsistence farming and a strong, kin-oriented social organization, which to a certain degree has continued to exist in the region until today (Hicks 1976). A number of researchers have investigated aspects of Appalachian society: Semple (1901); Brown (1952); Pearsall (1959); Schwartzweller et al. (1971); Still (1978); Conti (1980).

According to Caudill (1963:19), the earliest homes of the pioneers in eastern Kentucky were often in rock shelters, with the entrance walled off. Early log cabins were built by simply felling trees, cutting off the branches and notching the ends of the logs so they fit together. These cabins had mud floors, board roofs, and mud-chinked walls. Chimneys were built on the outside, sometimes of stone, but more often of sticks lined with mud (Cotterill 1917:246). Improvements over time consisted of split log floors, hewn log walls, the additions of lofts or second stories, and the construction of stone chimneys (Caudill 1963:19-20).

Coves and hollows were the dominant locations for settlement of the early pioneers in eastern Kentucky. The natural protection, arable soil, good water, and abundant timber were ideally suited to the cultural traditions and agricultural technology of the German and Scotch-Irish settler (Eller 1979:85). The earliest pioneers settled in the fertile lands at the mouth of the hollow. Later settlers and the descendants of early settlers moved up the stream toward the head of the hollow. This resulted in a linear pattern of settlement similar to the type identified as the "dispersed hollow settlement pattern" in the Big South Fork National River and Recreation Area architectural survey (Hutchinson et al. 1981:145). The average distance between the farmsteads in this settlement pattern is greater than in any other type of historic settlement pattern noted for pioneer settlement in other regions of the eastern United States similar to eastern Kentucky. This is attributed to the important role of hunting and trapping in the early region's economy. Settlers had to maintain their

distance from one another so as not to deplete the natural resources of an area.

The economic base of preindustrial Appalachia was the family farm.

> Each mountain homestead functioned as a nearly self-contained economic unit, depending upon the land and the energy of a single family to provide food, clothing, shelter and the other necessities of life (Eller 1979:92).

Mountain agriculture was not dependent upon a single cash crop as in the Deep South and the Midwest. Mountain farms remained "diversified and independent" and essentially subsistence-based (Eller 1979:92). In 1880, Appalachia as a whole had a greater number of non-commercial family farms than any other area in the country.

The staple crop of eastern Kentucky was corn, but oats, wheat, hay, sorghum, rye, potatoes, and buckwheat were also cultivated. In addition, each farm had a vegetable garden and usually some fruit trees and bee hives. Livestock consisted of cattle, sheep, mules, fowl, horses, and hogs. Wild berries and game also contributed to the subsistence diet. The mast from large tracts of nut-bearing trees allowed most of the livestock to roam free over the hillsides. Until the lumber industry bought and cut the timber, the southern Appalachian area was one of the largest producers of hogs in the country.

The agricultural technology of the early settlers was simple, and remained so for many generations. When a farmer needed more crop land, he simply cut the timber off a tract of land. After the large trees were cut, the loose brush and logs were piled up and burned and the stumps removed. At this point the ground was ready for plowing. Mule-drawn plows were used to make furrows, and the corn was planted by hand. Several weeks after the corn was planted the field was plowed again, and workers followed behind the plow with hoes. After this was done several times, the corn was considered "laid by." In September the corn was harvested by hand. The tops and blades were cut and saved for fodder. The corn, still on the stalks, was cut and hauled away to be shucked later in the fall or early winter. The corn shucks were used as fodder and for use in mattresses, door mats, etc. (Haney 1906:86-89; Arnow 1963:239-240). Corn for family use was taken to the nearest water-powered mill and ground into a coarse meal.

Most of the crops of these early farmers were grown for family use: small patches of burley tobacco supplied the members of the family with chewing and pipe tobacco; wheat and other grains could be ground at the mill into flours;

cane was made into sorghum; hay was used to feed the livestock. Hemp, flax, and sometimes cotton was grown in the early pioneer days for family clothing. Most women had spinning wheels and looms for making cloth.

Although most settlers in eastern Kentucky were primarily subsistence farmers, some participated in small-scale industries. Generally, the products of these activities were produced for home use, but small amounts of cash or store goods could be exchanged for items such as tanbark, hemp, or pinetar.

The home-tanning of deerskins was a common activity for settlers in the 1800's. After the hair "slipped" off a deerskin, the hide was scraped and put into a tan vat. The vat was usually made of a large hollow log. A layer of tanbark, shredded by hand, was placed in the vat. Next, a layer of skins was put in. This layering continued until the vat was full. The vat was then filled with water and the tannin in the bark gradually soaked into the leather. This process took anywhere from several weeks to six months. Black oak was the preferred bark for use in leather tanning. A farmer could spend part of his time gathering tanbark to sell, although the industry disappeared by about 1840 (Arno 1963:285-286).

Tar making was also an activity pursued by the early settlers. Pine knots were split into pencil-size splinters and placed on a sloping rock with a drain or log pipe leading down to a tar barrel. A large kettle was turned over the pile, and a fire was built around and on top of the kettle. The pine splints would char and cause the tar to run down the pipe into the barrel (Arnow 1963:287). Hockensmith and Sanders (1981) have discussed historic petroglyph sites for Johnson, Lawrence, Lee, and Powell counties which consist of an incized circle transected by linear grooves. Current literature suggests that these petroglyphs were possibly used for making pine tar, lye soap, and gun powder (Hockensmith and Sanders 1981:3).

Those who were selling the tar usually made a "proper kiln" consisting of a clay floor about 10-20 feet in diameter and a central catch basin connected by a wooden pipe to kegs outside the kiln. The splintered pine knots were stacked on the floor around the basin and a rail fence was built around the splints. The space between the fence and splints was packed with wet clay, and a fire was started at the top of the pile and partially smothered with tin or clay to keep it regulated. It was important to prevent burning the tar with the wood. Tar brought between 50-75 cents a gallon in Nashville (Arno 1963:287).

The cultivation of hemp was another economic pursuit of the early settlers. Hemp was grown in Kentucky as early as

1780 for use in making cloth. The pioneer could grow a small patch of hemp and have it yield enough fiber to make rope, clothing, towels, and feather ticks for his whole family (Arno 1963:254).

Salt was an important commodity in the early pioneer days, necessary for the preservation of food. When supplies from England were cut off after the Revolutionary War, salt was evaporated out of sea water on the east coast. However, the cost of transporting salt over the mountains made it very expensive and difficult to obtain in the interior (Verhoeff 1917).

Salt manufacture became an important industry in Kentucky in the early 19th century. Initially, sources of salt brine were springs with basins rich in salt and called "licks." Verhoeff (1917:1149) claims that the Indians taught the pioneers of Kentucky how to manufacture salt from the brine and the proximity of one of these springs was a factor in deciding where to settle. In 1813, the Kentucky Legislature began issuing cheap land grants in Wayne and Pulaski counties to encourage the discovery and manufacture of salt. The cost of the land was set at ten cents per acre Johnson 1939).

Manufacture of salt from these springs was a simple affair, although salt manufacture was not always a successful venture because of difficulties in transportation to market and the varying strength of the brine. Pots and kettles were filled with brine dipped out of the spring. These were then hung over an open fire in the cabin until the water evaporated and left the salt in the pot (Verhoeff 1917:149). This process was slow and inefficient, so the pioneers developed crude furnaces. The brine was collected and transferred to big copper kettles specially made for salt manufacture. Ten or twelve of these kettles were set out in a trench. Clay was used to stop up the interstices between the pots and a fire was kept burning at either end of the trench. Finally, the furnaces were enlarged to accommodate sixty kettles at a time. However, the cost of this operation and the low salt content of the brine prohibited profitable exportation of the salt (Verhoeff 1917:149).

When salt could not be obtained from an open spring or lick, a well was dug. A pit about eight square feet was excavated down to solid rock. The loose earth around the sides of the pit was walled with logs, and a spring pole was set up. Spring poles were constructed from long, straight saplings. The larger end was set in the ground above the pit, and a rope was fastened to the smaller end of the pole. A short pole was attached to the rope. When the pole was thus "strung," an iron socket was screwed into the lower end of the strung pole. The inside of this socket was threaded,

and an oversized auger was screwed into it. It took three men to work this spring-pole driller. One man turned the auger while the other two brought the spring pole up and down. The spring in the pole jerked the bit away from the rock. In this way a well was dug until salt water was reached (Arnow 1963:293). The maximum depth of these wells was about 400 feet. A system was set up where brine was pumped out of these deep wells into troughs which carried it directly to the kettles in the furnace. This system proved profitable and salt was shipped to Nashville and exchanged for money or other goods (Verhoeff 1917).

The best salt works in eastern Kentucky were in Clay County. The Goose Creek Salt works were in operation by about 1784 according to Arnow (1963:293) and by 1800 according to Collins (1874:141). By 1846, there were 15 salt furnaces in Clay County producing over 200,000 bushels a year. James Collins, who started the settlement known as Collins Station at the head of Collins Fork on Goose Creek, discovered a salt spring there in 1800. He is reportedly the first white man to have produced salt in America (Jillson 1934:76), although it is not certain whether Jillson is referring to the Goose Creek Salt Works or another salt works on Goose Creek. Collins (1874:353, 684, 679) also documents salt works in Jackson County on Horse Lick Creek, in Perry County on Leatherwood and Troublesome Creeks, and in Pulaski County where the Fishing Creek Salt Works produced "considerable quantities" in 1846.

The Beaty Salt Works appear on an 1863 map of Kentucky and Tennessee at the intersection of Roaring Paunch Creek, Big South Fork River, and Bear Creek (Simpson 1863). The Beaty Salt Works was started in 1817 when John Francis and Richard Slavey of Wayne County, Kentucky and Stephen T. Conn of Virginia began boring and exploring for salt water on the Big South Fork opposite the mouth of Bear Creek. They had claimed 1,000 acres in Wayne and Whitley Counties based on acts the Kentucky Legislature passed to encourage salt manufacture. Salt was manufactured at the works until 1840 (Johnson 1939).

Mining for saltpeter in rockshelters was another early industry in eastern Kentucky. The saltpeter was used for making gunpowder for flint lock rifles. Numerous saltpeter caves were located in Rockcastle County where large quantities of saltpeter were produced during the War of 1812. The output of nitre for the War of 1812 was higher in Kentucky than in any other state - 301,937 pounds were produced in 1812 (Kerr 1922:592). "Big Cave" or "Great Saltpeter Cave" in Rockcastle County was located on Big Hill, about eight miles northeast of Mount Vernon. This cave extends through the mountain about 1/2 mile and was discovered by John Baker and his wife who were lost in the cave for 40 hours after their lantern burned out. The

saltpeter cave employed 60-70 workers during the War of 1812. Salt was mined in the cave by torchlight and carried from one end of the mountain to the other by carts and wagons pulled by oxen (Collins 1874:691).

Saltpeter mining was especially important during the Civil War when the Confederate states relied on Virginia, Tennessee,and secretly on Kentucky for their supply of nitre (Webb and Funkhouser 1936). Digging for saltpeter was slow and heavy work. It was dug by hand and then crushed by hand or ground in a "gin" made of ungrooved logs turned by a crank at one end. After being crushed, the "peter dirt" was put into a leaching vat - a square built of hewn timbers notched and fitted together to be water tight. The bottom of the vat was made of two parallel layers of small white oaks, split and gouged out. The bottom was slanted so that the drippings from the ends of the bottom logs fell into another trough leading to a barrel or connected by a wooden pipe to storage vats outside the cave. In one day three men could leach out enough peter to make 50-100 pounds of saltpeter. After being leached in water, the peter-beer or nitrate was then leached through ashes. This watery potassium nitrate mixture was then cooked down to a thick semi-liquid, taken from the kettle, and dried slowly in troughs. After it was dried, it was ground on log rollers. Gunpowder was made by adding charcoal and sulphur to the saltpeter - 1/2 saltpeter to 1/4 each of charcoal and sulphur (Arnow 1963:288-289).

Two nitre mining sites have been recorded in the Daniel Boone National Forest. 15WO35 is a nitre mining site in Wolfe County which included hand-hewn troughs, wooden planks, sandstone walls and a fire hearth (Turnbow 1976). A nitre-mining site was also located by Jobe et al. (1980:67) in Powell County. 15POlll consists of several gravel tailing piles, sandstone "tables," and hewn logs. The site was dated ca. 1812-1864. Cowan and Wilson (1977) recorded an historic saltpeter works also in Powell County (PO74).

In 1818, Marcus Huling and Andrew Zimmerman, while drilling for salt with a spring-pole rig and a wooden bit, struck oil. They had drilled to a depth of 200 feet and hit a pool of oil. The oil ruined the salt works and neighbors complained of the oil that flowed into the Big South Fork River. Huling attempted to market the oil and, with much difficulty, managed to export 2,000 barrels to Europe. It was also marketed in the southeast as patent medicine. This Beaty Oil Well, as it was later named, was the first oil well in the country, and Huling's attempt was the first to commercially produce and sell oil. The well was abandoned in 1820,and Huling moved on in search of more salt wells.

Although Huling had discovered oil in Kentucky as early as 1819, there was no real attempt to market oil

commercially until the 1880's. There was a mild boom in 1900 and again in 1912, but it wasn't until oil was found by Charles Curin on Tick Fork of Cow Creek in 1916 that wildcat speculation occurred in Kentucky's oilfields. This discovery in Estill County started another oil boom, and by 1919 Kentucky's production of oil had peaked at nine million barrels. Although the Kentucky finds were not as spectacular as those in Oklahoma, the oil sands were closer to the surface and less capital equipment was necessary to drill a well (Massie 1960:22-23).

One of the largest oil operations to begin in Eastern Kentucky with the 1919 boom was the Swiss Oil Corporation. It was begun by J. Fred Miles, a wildcatter from Oklahoma. After an attempt to buy forty leases for wells in Estill County fell through, he succeeded in purchasing leases for wells in seven other eastern Kentucky counties. The company was incorporated and expanded its operations into the Big Sinking field in Lee County in 1919. A sawmill was built to supply lumber for the camp, and fifteen houses, a schoolhouse, a church, a commissary, a "flicker," a headquarters house and a baseball diamond were built. The Big Sinking field produced most of Swiss Oil Corporations' oil until 1921. By 1922, the principal producing properties in Lee and Magoffin Counties were nearly depleted. In the early 1930's,the production of oil in newly discovered east Texas oil fields made the production of oil from the small oil wells in eastern Kentucky uneconomical (Massie 1960:35). The Swiss Oil Corporation eventually merged with Ashland Refining Company whose emphasis was on refining rather than producing oil.

One 20th century oil well site has been recorded in the Daniel Boone National Forest. Bartnik et al. (1981) located Bh131 in Bath County, which contained collection vats, sheet metal, piping, and an old roadbed. Oil wells are abundant in many parts of the project area, especially in the oil fields in Powell and Clay Counties.

Iron furnaces were numerous in Kentucky in the first half of the nineteenth century. The first commercial iron in Kentucky was produced by Stephen Collins at the Red River Iron Works located in Powell County. In 1787, Collins and several associates set up a bloomery forge in the great north bend of Red River (Jillson 1934). Bloomerys produced wrought iron out of raw iron ore by burning out the impurities in a small open charcoal furnace. The mass of iron ore and siliceous slag produced was then beaten with a hammer until the slag was evenly distributed and the desired consistency reached (Knudsen 1980a). Collins shipped the iron ore in flat bottom boats down the Red and Kentucky Rivers to Cleveland Landing (Clays Ferry). From there, the iron castings, wrought iron nails, axes, and strap iron were transported by mule to Lexington. Collins set up three more

bloomerys on the great north bend in the next few years (Jillson 1934:10-13).

The Red River Iron Works changed hands several times. In 1813-1814,it obtained a contract with the War Department to make 50-pound cannon balls for use in the War of 1812. After the war, the iron works was altered and improved, and between 1816 and 1828,it was again known for its production of iron products. The works consisted of a furnace, forges, and a processing mill. Excessive mining and transportation costs finally caused the works to close in 1830, and the furnace stones were hauled to the top of the ridge at the head of Harwick's Creek and rebuilt as Estill Furnace (Jillson 1934).

The Clear Creek Iron Furnace in Bath County was built by John Mason in 1839. The furnace was built of cut stone, and the iron produced was used for the manufacture of railroad car wheels. Operating between 1839 and 1857, in 1872-1873 it was rebuilt and renamed Bath Furnace which began production in 1873 and closed in 1875 (Knudsen 1980a). Knudsen (1980a) has conducted archeological investigations at this site. An iron furnace was also reportedly located near Hail in Pulaski County, on the bluff above Buck Creek (Tibbals 1952:73).

All of these early iron furnaces were charcoal furnaces and were always built against a hill, so the charge (charcoal, ore and limestone) could be hauled with a cart on a level surface and then dumped into the top of the stack. The furnace was made of cut sandstone blocks and was cone- or square-shaped. It consisted of three parts - the hearth, the bosch, and the stack. The hearth had two and sometimes three holes in the stonework (called twyers) so that air could be blown into the furnace to make the fire hotter. The inside walls, or lining, of the furnace were smooth and the cracks filled with fire clay. Early linings were made of sandstone but since these cracked at high temperatures, fire-brick was used later.

When the furnace was completed, a fire was built inside of the stack until the furnace was dried out. At this point charcoal was added to the wood fire to make it hotter and the charge was added until the furnace was filled to the top. Air was forced through the twyers and the furnace was "in blast". The charcoal combined with the iron ore,and the limestone combined with the impurities until a smaller mass of iron ore and slag gradually settled in the hearth. The slag floated on top of the ore,and when it reached a certain point in the hearth, a dam plate of cast iron was lifted and the accumlated slag ran out into a ravine or pit. The iron flowed from the furnace into trenches made of sand and clay to form iron bars five to six feet long. These iron casts were called "pig iron" because of the shape of the trenches

(Seaton 1948).

The Red River Iron Manufacturing Company, chartered in 1865, rebuilt and improved the furnaces and mills of the old Red River Iron Works. In 1870, the company built two of the largest charcoal iron furnaces in the world in Estill County. Tramways, inclined planes, macadamized roads, mills, shops, and houses for one hundred workers were constructed. A town was chartered at the furnaces, called Fitchburg. In 1871, the Firchburg Furnaces produced almost 10,000 tons of pig iron (Collins 1874:167-168; Coleman 1971:106).

Although Kentucky was third in the nation for iron production in 1840, by 1871 she was seventh, and by the end of the 1870's,most of the iron furnaces in eastern Kentucky were closed. This was largely due to the increased competition from iron furnaces in the south, but also because of transportation difficulties in marketing the iron and the depletion of many timber stands for charcoal supplies.

The outbreak of the Civil War in 1860 polarized the people of Kentucky. Although the state government tried to remain neutral over the Civil War, Kentucky's border position meant that troops from both North and South passed through Kentucky, adding additional pressure for Kentucky to choose sides and enter the War. The establishment of Union recruitment camps in eastern Kentucky brought the Commonwealth into the War on the Union side (Knudsen 1982:13). In the Eastern Mountains, sympathies developed from hollow to hollow, and families were often split by divergent loyalties (Knudsen 1982:13). Resentment within and between families developed, leading to family feuding. One of the most famous American feuds was the long-standing feud between the Hatfield and McCoy families, who lived in Pike County, Kentucky and Logan County, West Virginia, along the Tug Fork of the Big Sandy (Rice 1978).

Several major Civil War skirmishes took place in Kentucky: the Battle of Wildcat Mountain in 1861, and a battle at Mill Springs in 1862 (Knudsen 1982:13). The War brought severe problems to the Eastern Mountains, since provisioning troops by both North and South depleted the local resources. Guerilla activity (robbers and murderers posing as soldiers) took a heavy toll in resources and population during and after the War (Caudill 1963:43). Recovery from the Civil War was slow, and the people returned to basically the same pre-war subsistence farming pursuits.

3. Post Civil War (A.D. 1880-Present)

The decades between 1880 and 1930 were years of transition and change for eastern Kentucky. The introduction of railroads, the development of towns and villages, and increasing industrial employment characterized the late 19th and early 20th centuries. Agriculture declined in importance as coal and timber companies purchased large tracts of land. By 1930, there had been a shift from subsistence farming to part-time farming and part-time wage labor. The region became integrated into the national economy, and much of the land was owned by absentee landowners.

The logging industry was active to some degree in eastern Kentucky beginning in 1825 when people in the Bluegrass began to realize the timber potential of the mountain counties. Lumber companies bought cut logs from private landowners or bought the land and then had the local people cut the trees. The logs were branded and then floated to market, usually Frankfort (Caudill 1963:35). Often rafts were constructed of the logs, and the men rafted the wood to market and walked home.

It wasn't until the 1870's that "the selling of the great trees took a new and important turn" (Caudill 1963:61). Speculators from northern cities (Cincinnati, New York, Philadelphia) learned of the great wealth of raw materials in eastern Kentucky and began to campaign for railroad construction into the area. Agents from northern companies came to the mountains and began seeking out the boundaries of the best trees. Corporations were organized for the sole purpose of speculating and buying the timber. The mountaineers who owned the great timber tracts began selling acres of wooded land for a few hundred dollars. Trees sold for between 40-75 cents a tree. In 1903, the Stearns Lumber Company in McCreary County opened a double-cut electric-driven band mill, and millions of board feet of timber were bought along the Big South Fork River and floated down to the mill (Hutchinson et al. 1981:13).

A sustained logging boom occurred between 1870-1910. The local mountaineers cut the logs and floated them downriver. Splash dams were built with long, slender tree trunks which were sealed with rocks and mud. When the logs were backed up in the streams, explosives were used to destroy the dams and the great flood of water sent the logs downriver to the mills.

Much of the timber purchased by the large corporations was not cut until the railroads were built. The housing boom after World War I caused many of the remaining virgin trees to be cut. Between 1915-1924, Fordson Coal Company, a subsidiary of the Ford Motor Company, bought more than one-

half of Leslie County for its timber resources (Caudill 1963:65).

A population explosion accompanied the introduction of railroads into eastern Kentucky. The Louisville and Nashville Railroad reached Harlan County by 1912. In the same year the Lexington and Eastern Railroad reached McRoberts in Letcher County on the North Fork of the Kentucky River. The tracks were built by small contractors from Alabama and Mississippi who were each assigned a stretch of 2-5 miles of line. A fleet of section cars followed the workers and parked on the side tracks. The contractors supplied food, clothing, alcohol, drugs, and shelter for the workmen and their families. Many Negroes from the Deep South were brought into Appalachia to work on the lines. Some local mountaineers joined the work gangs where they were paid about $1.50/day (Caudill 1963:93-95).

The coal companies followed the railroads into the Eastern Mountains. Some of these coal companies were newly organized and some were Kentucky subsidiaries of well-established corporations from other states. The coal companies built towns and camps as they established their mining operations, with machine shops, warehouses, barns for mules and horses, a coal tipple, houses for the workers and the administrators, and company stores. Some of the larger companies built recreation halls, administration buildings, hospitals, and schools. The supervisory personnel were brought into the Kentucky coalfields from Virginia, West Virginia, and Pennsylvania. The mine workers were the local mountaineers who left their farms and moved into the camps and towns. The population influx from outside the area, with differing social attitudes resulted in an additional social group in eastern Kentucky society. The coal boom, started by the arrival of the railroad began to change the subsistence activities, social make-up, and other aspects of the Eastern Mountains lifeway. Most of the mountain people found themselves on the bottom rung of a new social organization (Lewis, Johnson and Askins 1978:10-11).

Miners entered the driftmouth of the mine early in the morning and rode empty coal cars (at first drawn by horses or mules and later by locomotive) into the mine. They walked from the cars to the coal face. Here, the miner set safety timbers close to the coal and then began to cut the coal. This was done with a pick by the miner and his helper, kneeling on the mine floor. When all the coal was removed from an area 12-15 feet wide and as deep as the pick handle, the fine coal from the cut-line was raked out. This left a block of coal suspended from the ceiling. At this point the workmen began to drill and shoot the coal. The miners drove an auger into the coal face by pressing against it with their chests (covered with a breastplate) while turning the handle. When a line of these holes were drilled,

a black powder charge was pushed into each hole. The men returned to a safe place while the foreman inspected the job and set the fuse. When the powder fumes were blown away the men returned to the face and extended the track to the huge pile of loose coal. This coal was then shoveled into cars and the full cars were pushed to the entryway. When the coal was all hauled away, the slate and other refuse were loaded into a car and hauled away. This marked the end of the miner's ten hour workday and left the coal face in its original condition, 6 feet further back (Caudill 1963).

The coal boom extended from 1912-1927 and had a tremendous impact on the region's economy. In 1927, the coal industry began to sag, and by the 1929 stock market crash only the largest coal companies were still in business. A substantial migration to northern and eastern cities occurred but some of the mountaineers remained and returned to susbistence farming.

By the end of World War II, the coal mining industry was mechanized and the huge labor supplies of earlier times were not needed. Truck mining developed at this time. These were owned by individuals, often local residents who had been miners for years. The coal was blasted out of the seam, shoveled into cars which were hauled to loading bins, and then trucked to a tipple (Hazard Chapter D.A.R. 1953:63; Caudill 1963).

IV. DATA BASE DESCRIPTION

In this chapter, the kinds of sites located on FMO lands are described and discussed in order to present information for BLM concerning the specific types of sites under its jurisdiction. Biases and deficiencies of the regional data base are also discussed.

According to the OSA computer files which were updated in 1982, there are 1868 recorded sites in the 21 counties in Eastern Kentucky which contain FMO lands. The prehistoric and historic properties located on FMO lands represent only 23% of the known sites in these counties (Table 2). 72% of the sites located in the Daniel Boone National Forest are also located on FMO lands. Sites located in Yatesville and Fishtrap Reservoirs which occur on FMO lands constitute 36% of the recorded sites in Lawrence County (Yatesville Reservoir) and 46% of the known sites in Pike County (Fishtrap Reservoir).

The vast majority of these cultural properties were recorded during timber sales, land exchanges, and especially reservoir surveys. On the Upper Cumberland River and its major tributaries, such reservoir-related work includes Wolf Creek Dam, Martin's Fork, Laurel River, and Parker Branch. In the Big Sandy drainage, these include Grayson, Dewey, Fishtrap, Paintsville, Yatesville, Flannagan, and Kehoe. On the Upper Kentucky River, reservoir surveys have been conducted at Buckhorn, Booneville, Carr Fork, and Red River Reservoirs. Finally, Cave Run and Falmouth Reservoirs on the Licking River have prompted cultural resource investigations. To date, very few of the identified sites in the region have been tested or excavated (Table 3). Sixteen prehistoric sites have been excavated by reservoir salvage investigations; sixteen sites were excavated in the 1920's and 1930's by Webb, Funkhouser, and Haag.

The term "testing" is used here to include any attempt to determine whether or not subsurface deposits exist. This may be limited to a "shovel test," (a 25 cm x 25 cm x 25 cm hole), but also includes much more intensive investigations such as those reported by Rolingson and Rodeffer (1968a) or Cowan (1974). These data have been compiled by examination of the computer data contained in the OSA state archeological site files and from information presented in Boisvert and Clay (1982).

Several site types can be discussed for the prehistoric and historic properties located on FMO lands in eastern Kentucky. These site types are those which have been coded for sites included in the OSA state archeological site

Table 2. Total Recorded Sites for Counties with FMO lands.

Eastern Kentucky Counties Containing FMO Property	Site Totals		
	OSA	U.S.D.A. Forest Service	FMO
Bath	120	43	31
Bell	63	*	0
Clay	40	12	12
Estill	22	3	2
Jackson	56	25	7
Harlan	33	1	0
Laural	93	18	28
Lawrence	201	*	73
Lee	43	7	3
Leslie	18	14	11
McCreary	195	82	23
Menifee	214	172	119
Morgan	89	4	2
Owsley	26	0	0
Pike	67	*	24
Powell	144	34	15
Pulaski	233	65	1
Rockcastle	49	27	21
Rowan	58	50	43
Whitley	62	35	16
Wolfe	42	23	15
	N=1868	N=615	N=446

* No Forest Service land.

Table 3. Sites Tested and Excavated on FMO Lands.

Site No.	Tested	Excavated	Reference
Bath:			
15BH15		X	Webb 1941
15BH17*	X		Purrington and Smith 1967
	X		Rolingson and Rodeffer 1968
15BH24*	X		Rolingson and Rodeffer 1968
		X	Marquardt 1970
15BH33*	X		Marquardt 1970
15BH36	X		Purrington and Smith 1967
15BH37*	X	X	Rolingson and Rodeffer 1968
		X	Marquardt 1970
15BH53	X		Knudsen 1980a
15BH55	X		Turnbow and Allen 1977
Bell:			
15BL5	X		Dorwin 1970
15BL15	X		Lafferty 1976
15BL16	X		Lafferty 1976
Clay:			
15CY8	X		Higel 1967
15CY9	X		Higel 1967
15CY12*	X		Higel 1967
15CY13	X		Higel 1967
15CY14	X		Higel 1967
15CY15	X		Higel 1967
15CY16	X		Higel 1967
Estill:			
	0	0	
Harlan:			
15HL304		X	Schock 1977
Jackson:			
	0	0	

* Sites on FMO Lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	Reference
Laurel:			
15LL26	X		Turnbow et al. 1977
15LL27	X		Turnbow et al. 1977
15LL28	X		Turnbow et al. 1977
15LL29	X		Turnbow et al. 1977
Lawrence:			
15LA2 *	X		Fenwick 1976
15LA9 *	X		Fenwick 1976
15LA11*	X		Fenwick 1976
15LA14*	X		Fenwick 1976
15LA15*	X		Fenwick 1976
15LA17*	X		Fenwick 1976
15LA19*	X		Fenwick 1976
15LA31*	X		Fenwick 1976
15LA32*	X		Fenwick 1976
15LA37*	X		Fenwick 1976
15LA39	X		Fenwick 1976
15LA42*	X		Fenwick 1976
15LA45*	X		Fenwick 1976
15LA46*	X		Fenwick 1976
15LA58*	X		Fenwick 1976
15LA67*	X		Fenwick 1976
15LA199	X		Fiegel 1980
15LA200	X		Fiegel 1980
15LA302	X		Schock 1975
	X		Richardson 1976
Lee:			
15LE1		X	Funkhouser and Webb 1929
Leslie:			
	0	0	

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	References
McCreary:			
15MCY28	X		Ison and Sorenson 1979
15MCY40*	X		Soil Systems 1980
15MCY41*	X		Soil Systems 1980
15MCY42	X		Soil Systems 1980
15MCY43*	X		Soil Systems 1980
15MCY44	X		Soil Systems 1980
15MCY45	X		Soil Systems 1980
15MCY46	X		Soil Systems 1980
15MCY47	X		Soil Systems 1980
15MCY48	X		Soil Systems 1980
15MCY49	X		Soil Systems 1980
15MCY50	X		Soil Systems 1980
15MCY51	X		Soil Systems 1980
15MCY52	X		Soil Systems 1980
15MCY53*	X		Soil Systems 1980
15MCY54*	X		Soil Systems 1980
15MCY55*	X		Soil Systems 1980
15MCY56*	X		Soil Systems 1980
15MCY57*	X		Soil Systems 1980
15MCY58*	X		Soil Systems 1980
15MCY59*	X		Soil Systems 1980
15MCY60*	X		Soil Systems 1980
15MCY61*	X		Soil Systems 1980
15MCY62*	X		Soil Systems 1980
15MCY63	X		Soil Systems 1980
15MCY64	X		Soil Systems 1980
15MCY65*	X		Soil Systems 1980
15MCY66	X		Soil Systems 1980
15MCY67*	X		Soil Systems 1980
15MCY68	X		Soil Systems 1980
15MCY69	X		Soil Systems 1980
15MCY70*	X		Soil Systems 1980
15MCY75	X		Knudsen 1980b

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	References
Menifee:			
15MF1		X	Webb and Funkouser 1936
15MF10*		X	Excavated by Haag 1942 (no report)
15MF19	X		Purrington and Smith 1967
	X		Rolingson and Rodeffer 1968
15MF28	X		Cowan 1975
15MF30	X		Cowan 1974
15MF32**	X		Cowan 1974
Morgan:			
15MO1	X		Rolingson and Rodeffer 1968
	X		Marquardt 1970
15MO13**	X		Dexter 1974a
15MO15	X		Dexter 1974a
15MO22		X	Dexter 1974b
15MO23**	X		Dexter 1974a, 1974b
15MO35**	X		Dexter 1974a
15MO37	X		Sanders 1976
15MO38	X		Sanders 1976
15MO39	X		Sanders 1976
15MO43	X		Sanders 1976

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	Reference
Owsley:			
15OW1	X		Higel 1967
15OW3	X		Higel 1967
15OW4	X		Higel 1967
15OW7	X		Higel 1967
15OW8	X		Higel 1967
15OW9	X		Higel 1967
15OW10	X		Higel 1967
15OW11	X		Higel 1967
15OW12	X		Higel 1967
15OW13	X		Higel 1967
15OW15	X		Higel 1967
15OW16	X		Higel 1967
15OW17	X		Higel 1967
15OW18	X		Higel 1967
15OW19	X		Higel 1967
15OW20	X		Higel 1967
15OW24	X		Higel 1967
Pike:			
15PI7	X		Hanson 1964
		X	Dunnell 1966a, 1966b
15PI8		X	Dunnell 1966a, 1966b
15PI9	X		Dunnell 1966a
15PI10	X		Dunnell 1966a
15PI11*	X		Dunnell 1966a, 1966b
		X	Dunnell et al. 1971
15PI313	X		Schock and Foster 1976a
		X	Schock and Foster 1976b
15PI315	X		Schock and Foster 1976a
15PI322	X		Schock and Foster 1976a
		X	Schock and Foster 1976b

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	Reference
Powell:			
15PO11	X		Cowan 1974
15PO17**	X		Cowan 1974, 1975
		X	Cowan 1976
15PO31**	X		Cowan 1974
	X		Cowan 1975
15PO42**	X		Cowan 1974
		X	Cowan 1976
15PO46**	X		Cowan 1974
15PO47**	X		Cowan 1974
		X	Cowan 1976
15PO49	X		Cowan 1974
15PO476		X	Cowan 1977
Pulaski:			
15PU119	X		Pollack and Boisvert 1981
15PU130	X		Smith and Driskell 1978
15PU304	X		Crusoe and McGraw 1976
15PU305	X		Crusoe and McGraw 1976
15PU306	X		Crusoe and McGraw 1976
15PU308	X		Crusoe and McGraw 1976
15PU309	X		Crusoe and McGraw 1976
15PU310	X		Crusoe and McGraw 1976
15PU313	X		Crusoe and McGraw 1976
15PU323	X		Crusoe 1976
15PU325	X		Crusoe 1976
15PU329	X		Schock 1976
15PU330	X		Schock 1976
Rockcastle:			
15RK16	X		Pollack et al. 1978
15RK310	X		Crusoe and McGraw 1976
15RK313	X		Crusoe and McGraw 1976

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	Reference
Rowan:			
15RO8*	X		Marquardt 1970
15RO30*	X		Marquardt 1970
15RO34		X	Dorwin et al. 1970
15RO35		X	Brooks et al. 1979
15RO36		X	Brooks et al. 1979
15RO37*	X		Turnbow and Allen 1977
15RO38*	X		Turnbow and Allen 1977
Whitley:			
15WH16	X		Fenwick 1976
15WH17	X		Fenwick 1976
15WH19	X		Soil Systems 1980
15WH20	X		Soil Systems 1980
15WH21*	X		Soil Systems 1980
15WH22*	X		Soil Systems 1980
15WH24	X		Soil Systems 1980
15WH25	X		Soil Systems 1980
15WH26	X		Soil Systems 1980
15WH27	X		Soil Systems 1980
15WH28	X		Soil Systems 1980
15WH29	X		Soil Systems 1980
15WH30	X		Soil Systems 1980
15WH31	X		Soil Systems 1980
15WH32	X		Soil Systems 1980
15WH33*	X		Soil Systems 1980
15WH34*	X		Soil Systems 1980
15WH35	X		Soil Systems 1980
15WH36	X		Soil Systems 1980
15WH37	X		Soil Systems 1980
15WH38	X		Soil Systems 1980
15WH39	X		Soil Systems 1980
15WH40	X		Soil Systems 1980
15WH41	X		Soil Systems 1980
15WH42	X		Soil Systems 1980
15WH302	X		Schock 1977
15WH303	X		Schock 1977
15WH305	X		Schock 1977
15WH306	X		Schock 1977
15WH307	X		Schock 1977
15WH308	X		Schock 1977

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

Table 3 continued

Site No.	Tested	Excavated	Reference
Wolfe:			
15WO1*		X	Funkhouser and Webb 1930
15WO2*		X	Funkhouser and Webb 1930
15WO3		X	Funkhouser and Webb 1930
15WO5		X	Funkhouser and Webb 1930
15WO6		X	Funkhouser and Webb 1930
15WO8		X	Funkhouser and Webb 1930
15WO10		X	Funkhouser and Webb 1930
15WO11		X	Funkhouser and Webb 1930
15WO12		X	Funkhouser and Webb 1930
15WO14		X	Funkhouser and Webb 1930
15WO17		X	Funkhouser and Webb 1930
15WO18		X	Funkhouser and Webb 1930
15WO19		X	Funkhouser and Webb 1930
15WO26* **	X		Cowan 1974

* Sites on FMO lands.
** Sites listed in the National Register of Historic Places.

files.

Four prehistoric site types have been recorded for FMO lands in eastern Kentucky: rockshelters, open sites, quarry sites, and stone box burial sites. The best represented site type is the rockshelter (Table 4). This type of site is a unique and valuable cultural property. As discussed in Chapter III, eastern Kentucky rockshelters are frequently dry, which contributes to the superb preservation of normally perishable materials that may include floral and faunal remains, as well as cordage, worked wood and bone, leather, and other very fragile cultural debris (Funkhouser and Webb 1929, 1930; Webb and Funkhouser 1936; Cowan 1975, 1976; Wyss and Wyss 1977). Because these shelters afforded "ready-made" homes to the region's prehistoric inhabitants, there is also a high potential for such sites to contain stratified cultural deposits. Unfortunately, rockshelter sites attract relic collectors and vandals who dig for pleasure and profit.

The second most commonly occurring prehistoric site type located on FMO lands is the open site. This site type appears to be a "catch-all" in the OSA state archaeological site files and includes nearly every type of prehistoric site that is not situated in a rockshelter (i.e., very small chipping stations, hunting camps, special activity loci, villages, and other site types which are located in stream bottoms, terraces or in upland areas). For example, site 15LL4 is listed as an open site but an examination of the original site form reveals that it is actually a mound complex consisting of six high mounds and a red ochre rock mound.

A third prehistoric site type includes quarry sites which exhibit evidence of extractive activities. Typically, such sites are located in direct association with chert outcrops. Site areas contain a high relative frequency of debitage which reflects primary stages of lithic reduction in stone tool manufacture.

A final prehistoric site type contains a single example of what is commonly referred to as a stone box burial. The site, 15MF25, was examined after it had been severely disturbed by agricultural activities. It contained a single individual and is thought to be Middle Woodland in age (Hanson 1964a).

Prehistoric isolates included in Table 4 usually refer to formal tools (e.g., bifaces, scrapers, and projectile points) observed in open contexts without additional associated materials. The OSA does not have an established policy regarding the treatment of such sites but, rather, leaves all decisions concerning site definition to the discretion of the individual archeologist. Isolated

Table 4. Distribution of FMO Lands Prehistoric Site Types.

Management Unit	Site Type					
	Rock shelter	Open	Quarry	Stone Box Burial	Isolated Find	N
Berea	18	4	0	0	0	22
London	27	3	0	0	1	31
Morehead	4	75	3	1	1	84
Redbird	7	2	0	0	0	9
Somerset	2	0	0	0	0	2
Stanton	120	3	1	0	0	124
Stearns	20	2	0	0	0	22
Fishtrap	0	24	0	0	0	24
Yatesville	0	67	0	0	0	67
Total	198	180	4	1	2	385

artifacts found in rockshelters are generally included in the rockshelter site category. Low density sites found elsewhere are included in site descriptions as open sites or as isolated finds.

A small number of sites were reported to contain both historic and prehistoric components. These occur most commonly in rockshelters. These dry, protected areas, used as habitation loci in prehistoric times, frequently were used in historic times as livestock pens, as habitation loci for Euroamericans, and as the location for moonshine stills.

Historic properties located on FMO lands (Table 5) reflect a wide range of site types that include dwellings, farmsteads, moonshine stills, stone furnaces, enigmatic stone piles, sites that are believed to represent potassium nitrate (salt peter) mining and related activities, and other miscellaneous sites.

The component designations in Table 6 reflect the chronological periods recognized for the region as discussed in Chapter III: Paleo-Indian, Archaic, Woodland, and Late Prehistoric, Historic. The number of sites on FMO lands in eastern Kentucky which represent these specific temporal/cultural affiliations is quite small, however. This is because many sites, as discussed in Chapter III, are assigned "general prehistoric" designations. This assignment indicates that artifacts diagnostic of specific cultural components were not recovered when the site was discovered and reported.

There are a number of biases and deficiencies that can be identified for the cultural resource data base of eastern Kentucky. An awareness of these biases and deficiencies is important to developing an understanding of the status of the cultural properties in the Eastern Mountains. The information currently available from the region is little more than highly biased inventory data (cf., Collins and Brooks n.d.). Factors which influence these inventory data have been discussed by Pollack (1981:20-30). These include 1) the changing focus of archeological research, 2) the concentration of research in narrowly focused geographic areas, 3) the lack of systematic surveys, 4) the lack of uniform field techniques, 5) the inconsistent application of what constitutes a "site," 6) failure to locate certain types of sites due to environmental conditions, and 7) the inconsistent recording of historic archeological properties.

As Willey and Sabloff (1980) noted, the field of archeological research has undergone a number of important theoretical changes which have directly affected the methods used by archeologists in the field and laboratory, the data that have been collected, and the research questions that have been addressed. The information in the OSA state

Management Unit	Dwelling	Farmstead	Moonshine Still	Potassium Nitrate Mining	Stone Furnace	Stone Piles	Miscellaneous Historic Site Types	N
Berea	0	0	0	0	0	1	1	2
London	6	0	1	0	0	2	5	14
Morehead	1	1	0	0	0	0	4	6
Redbird	2	6	2	0	0	0	5	15
Somerset	0	0	0	0	0	0	0	0
Stanton	0	0	3	5	6	0	8	22
Stearns	1	2	0	0	1	1	2	7
Fishtrap	0	0	0	0	0	0	0	0
Yatesville	8	0	0	0	0	0	3	11
Totals	18	9	6	5	7	4	28	77

Table 5. Distribution of Historic Site Types on FMO Lands by Management Unit.

Management Unit	Total Sites	General Prehistoric	Paleo-Indian	Archaic	Woodland	Late Prehistoric	Historic	Mixed Historic and Prehistoric
Berea	24	19	0	2	1	0	2	0
London	41	21	0	1	7	3	14	4
Morehead	88	72	0	5	8	3	6	2
Redbird	23	6	0	0	2	1	15	1
Somerset	2	2	0	0	0	0	0	0
Stanton	142	96	0	2	15	16	22	4
Stearns	29	18	0	2	2	0	7	0
Fishtrap	24	9	0	3	6	7	0	0
Yatesville	73	57	0	3	5	5	11	5
Totals	446	300	0	18	46	35	77	16

*Some sites contain more than one component so that totals of site components may be greater than the total number of sites.

Table 6. Summary of Cultural Temporal Site Affiliations for FMO Lands by Management Unit.

archeological site files reflect these changes, since sites were first recorded in the earliest, particularistic period of American archeology and continue to be recorded today. The data also reflect highly variable expertise and archeological experience on the part of those who have reported the sites.

Archeological research in eastern Kentucky has been concentrated primarily in the flood pools of proposed reservoir projects such as Yatesville and Fishtrap Reservoirs at the expense of upland areas and upland tributaries. Generally, the resulting findings constitute a biased reflection of the site types and their distributions throughout the reservoir. In order to develop an understanding of the cultural developments in the Eastern Mountains, all environmental zones, not just major river floodplains must be examined. In many instances, the reservoir projects did not include systematic survey coverage, and, in fact, some of the consequent publications have reported negative findings (cf., Rolingson and Schwartz 1963; Sloan 1958; Warholic 1970; Duffield and Hardy 1970). In instances where more systematic coverage has been reported, the contractual obligations restricted survey work to the area of direct environmental impact.

Archeological field techniques have varied through the years, and the Eastern Mountains data reflect this type of bias. Field methods used by the early investigators were quite different from those used by more recent researchers and these differences,(i.e., the lack of accurate, detailed field records and maps, and paucity of stratigraphic information), make these early reports relatively unusable for comparative purposes. In many instances, earlier reports do not contain a description of survey techniques that were employed. The collector-interview method was generally successful for identifying large, well-known, and heavily vandalized sites but failed to locate smaller sites. Martha Rolingson (personal communication, 1982) has suggested that the survey technique most frequently employed for many of the early reservoir surveys included very little on-the-ground survey coverage. Systematic coverage is the currently used survey method which includes subsurface testing in heavily alluviated and vegetated areas. Thus, the earlier work focused on identification of the largest, well-known sites, while today, all site sizes are recorded.

The lack of a consistent definition of "site" has also added bias to the data. The definition of what constitutes a site, one of the most basic concepts in archeology, has been frequently debated and often modified to suit the particular needs of any given researcher. A recent survey conducted on Daniel Boone National Forest defined a site as the "locus at which any archaeological remains occur" (after Chartkoff and Chartkoff 1980:9). As a result, a badly

damaged plastic jug was recorded as a site! Some investigators assign separate site numbers to the house, barn, privy, and to each of the outbuildings at historic sites. To some investigators, a locality is a "site" only when diagnostic artifacts are recovered. Still other investigators focus only on extremely rich areas as "sites" and tend to ignore small lithic scatters or the occasional projectile point found in a logging road. It is important for researchers to distinguish between theoretical and operational definitions of a site, but, at the very least, every report should contain an explicitly stated definition of what constitutes a "site" for that particular investigation. It would be extremely helpful if representatives from the Office of the State Archeologist, the State Historic Preservation Office, and the archaeological community would seriously address the problem of what constitutes a site and reach a consensus that could be uniformly applied to the entire Commonwealth.

Environmental conditions hamper site discovery in the Eastern Mountains and in the Eastern Woodlands of the United States as a whole. Much of eastern Kentucky consists of rugged, forested terrain which severely restricts land surface visibility, affecting the archeologist's ability to locate sites. Sites both large or small may not be identified due to heavy vegetation. Alternatively, sites may be covered by thick alluvial and/or colluvial deposits, products of early historic logging activities. Thus, certain types of sites which have low visibility may be decidedly under-represented in the state archeological site files. In rockshelter contexts, materials from earlier components may go undetected, if subsurface testing has not been conducted, and thus early cultural components may be under-represented in the state archeological site files as well.

The state archeological site files contain a decided bias with respect to historic cultural properties. This bias is the result of two factors: 1) historic sites (standing structures as well as ruins) have only recently been recorded by archeologists conducting surveys, and reported as archeological sites; and 2) the Kentucky Heritage Council maintains a separate inventory of historic standing structures which in the past were not classified as archeological sites. The Heritage Council's inventory has not been incorporated into the OSA state archeological site files, and thus standing structure properties will be under-represented in the OSA files.

As Clay (1980:71) has aptly pointed out, historic archaeology is "one of the important, untapped cultural resources of Kentucky." A review of historic archeological investigations conducted in the Commonwealth serves to substantiate Clay's statement. Far too frequently, prehistoric archeologists have encountered historic remains

while conducting archeological surveys and only mention such sites in passing (cf., Soil Systems: 1980), or have simply presented laundry lists of historic artifacts recovered (cf., Collins 1979: 418-470). It is only in the past five years that there has been an active attempt to even record historic sites (Clay 1980:72). This has resulted in very low totals of historic sites documented in the Eastern Mountains, a distinct bias in the regional inventory data base.

To date, only one historic archeological site in eastern Kentucky has received more than cursory attention (Knudsen 1980a). In most instances, those investigators who have documented the existence of the historic resources have had little training with regard to historic resources, especially standing structures. It is particularly significant that various forms of vernacular architecture have not been reported in the project area including single pen houses, Cumberland houses (Montell and Morse 1976; Hutslar 1977; Wright 1958; Riedl et al. 1976; Vlach 1972) and other examples of vernacular architecture. This omission also includes vernacular forms of barns and outbuildings such a single-slope roof sheds, single-, double-, and four-crib barns; transverse-crib barns, and side-opening English barns (cf., Hutslar 1977; Glassie 1970; Kniffen 1965; Montell and Morse 1976). These architectural forms have been documented in McCreary County by Hutchinson et al. (1982) and in Lawrence County by Carlisle (1978) and are thought to be ubiquitous throughout the eastern portion of the state (cf., Dugan et al. 1982; Millican Associates Inc. et al. 1982). The Kentucky Heritage Council has conducted county-wide surveys focused on historic standing structures, and maintains an inventory of these properties in Frankfort. In most instances, these properties, which may be the vernacular forms of architecture discussed above, have not been recorded as historic archeological sites and included in the OSA state archeological site files. This has created a bias in the OSA inventory files with regards to these types of cultural properties.

Fortunately, the research potential of Kentucky's historic cultural resources is beginning to be recognized. Fay (1980) conducted testing of historic archeological deposits associated with Liberty Hall in Frankfort which emphasizes the fact that many standing structures of historic significance found throughout the state may also be expected to have equally important subsurface deposits. More recently, Janzen (1981) has published a model piece of historical archeology written for popular consumption, documenting the results of field work completed at Shakertown in Mercer County, Kentucky.

Formal historic archeological investigations that include fully developed research procedures and analytic techniques

are rare to non-existent in Kentucky. No such research has been undertaken in eastern Kentucky, although investigation into settlement along historic trails, and documentation of the growth and decline of the numerous industries discussed in Chapter III are certainly potential avenues for future research in the region. Two major exceptions are recent publications on the Linville Site (15BK12) in Bracken County (Granger and Ball 1982) and Wesler's (1982) test excavations at Whitehaven in western Kentucky. These research projects are excellent examples of research for other similar mid-19th century domestic residences in Kentucky. With the aid of all archeologists working in the region, there is no reason why Clay's initial statement must remain anything more than a footnote in the history of regional archeological investigations.

In addition to the seven inventory data biases discussed in this chapter, an important deficiency in the cultural resource data deserves special mention. Research in the Eastern Mountains suffers from a lack of diagnostic materials recovered from datable contexts. The vast majority of recorded sites in the region have been assigned to the "general prehistoric" category because no diagnostics were recovered from the site surface during survey, or because no sub-surface testing or excavation has been conducted. Because we lack dated, diagnostic artifacts, local and regional chronologies are difficult to build for the region. Solid local and regional chronologies are the foundation upon which more detailed research depends, and this affects our ability to gain a clear understanding of the cultural developments in the region.

The Forest Service policy regarding site testing and mitigation of impacts may be a contributing factor to the lack of excavated sites in the region. Although the Forest Service has done an excellent job of staying abreast, if not ahead, of their responsibility to inventory sites located on proposed timber sale tracts and land exchanges, very few sites on Daniel Boone National Forest have been evaluated in terms of National Register criteria. To date, only one site has been tested (15McY79) in advance of a land exchange, and no sites have been evaluated with regard to potential impacts associated with timber sales. Knudsen (1982:28) indicated that current Forest Service policy is to avoid potential impacts (and thus the immediate need to evaluate sites or to mitigate impacts) by eliminating acreage containing archeological and historic properties from proposed land exchanges and timber sales. At this time, there are 259 properties recorded during surveys of proposed sales and exchanges that have been recommended for testing, but which have been deleted from areas to be impacted. This figure represents 42% of the known sites located on the Forest. While such a policy reflects an optimum preservation strategy, it provides little information with

regard to regional research questions or accurate appraisals of what these sites may contain and/or represent. It must be acknowledged that the Forest Service's responsibility towards cultural resource is one of management, not conducting research.

If archeologists are to develop an understanding of the cultural developments in the Eastern Mountains, sites with the potential for yielding datable diagnostic artifacts must be investigated. With the basic temporal/spatial research questions addressed, more detailed research issues can be pursued.

V. FUTURE RESEARCH CONSIDERATIONS

A. INTRODUCTION

As indicated in the previous chapter, archeological investigation conducted in eastern Kentucky has focused on locating and inventorying sites. Excavation, cultural historical syntheses,and problem-oriented investigations are generally lacking. In order for BLM to develop and implement an effective management program for these resources, however, it is important that a method for identifying significant sites be developed as it applies to National Register of Historic Places criteria. One approach to assessing site significance lies in the development of a regional research design. The term may be generally defined as:

> a plan for conducting an archeological investigation preparatory to understanding a particular study. It includes a statement of the problem, basic assumptions, activities and techniques, including strategies and methods required for problem solution and hypothesis testing, and a specification of the relevant data and how they will be utilized for a full understanding of the resource. A research design is usually in sufficient detail to permit the evaluation of its methodological sophistication and feasibility (McGimsey and Davis 1977:112).

Neither a state historic preservation plan for the region (cf., Clay 1980) nor a regional research design exist, however. And although Collins and Brooks (n.d.) called for the formulation of such a regional research design as a result of their study of the Eastern Coalfields, to date no such research design has been implemented.

Formulation of a regional research design is beyond the scope of this study. However, discussion of important research questions that are particularly applicable to the Eastern Mountains region are included in this chapter. It should be noted that it is not possible to include all topics of interest to all researchers. Neither is it possible to adequately anticipate future research orientations and data requirements. This discussion of research questions is intended to simply outline possible avenues of research for future investigations in eastern Kentucky, as an aid for BLM in formulating a method for assessing site significance for sites within its jurisdiction.

This discussion will be structured around three generally accepted goals of American archeology: definition of cultural chronologies, reconstruction of past lifeways, and explanation of cultural processes (Thomas 1979:137-146). These goals are interrelated and must be achieved in sequence to be successful. In the following sections, these goals will be discussed as they relate to the region's prehistoric record. Special problem domains related to historic sites and to site impact analyses will be presented following the prehistoric discussion.

B. PREHISTORIC RESOURCES PROBLEM DOMAINS

1. Culture History

The Explanatory Period (Willey and Sabloff 1974:178-211) notwithstanding, there is a critical need in eastern Kentucky to conduct traditional, normative archeological research which focuses upon refining chronologies and typologies. A serious effort to define new local units and to test the validity of existing taxa within each temporal and cultural unit is a necessary prerequisite before lifeways can be reconstructed or theories of culture process can be adequately examined. It is important to emphasize that chronological data cannot be gained from survey collections alone. More excavation, especially of stratified and single component sites, is urgently needed in the Eastern Mountains to aid in chronology formation.

In order to build local chronologies, it is necessary to include comparable data sets in each published report. It is simply inadequate to list projectile points or ceramics by their type names if they are not also fully described. It is recommended that archeologists working in eastern Kentucky follow a method of projectile point description which will produce more comparable descriptions. Ahler's Projectile Point Form and Function at Rodgers Shelter, Missouri (1971) outlines a particularly useful measurement system which provides the necessary information for defining the range of variation between and within projectile point types. Likewise, ceramic descriptions should include a minimal level of documentation and description in order to produce more comparable descriptions. Ceramic type descriptions written by Haag (1942:341-349) to describe the C and O Mounds ceramics, or Dunnell (1966a:Appendix I) for Fishtrap Reservoir are good examples of the kind of information which should minimally be included in ceramic descriptions.

A particularly useful research tool for the development of chronologies for eastern Kentucky would be the creation

of a projectile point type collection in complement to the existing ceramic type collection maintained by the University of Kentucky, Museum of Anthropology. Such a collection could be established by selecting representative projectile points from collections recovered from eastern Kentucky sites prior to curation. As more and more specimens were added to the central repository's type collections, the professional community could eventually gain the perspective necessary to adequately assess the validity of projectile point types.

Along with substantiating taxa and defining new archeological units, there must be an active attempt to obtain absolute and relative dates for each unit/taxon. Radiocarbon, archeomagnetic, and thermoluminescence dates are crucial for temporally ordering these units, but these data must be associated with diagnostic artifacts, in order to help build local and regional chronologies.

A valuable research tool would be the creation of a file for absolute dates recovered from sites in eastern Kentucky. This file could be maintained by the same central repository responsible for curating the type collections or by the Office of State Archaeology. Each new radiocarbon, thermoluminescence, archeomagnetic, or similar date obtained from a site in eastern Kentucky, along with pertinent information could be entered and filed. Minimally, the information recorded should include site number, type of date, laboratory sample number, type of sample, cultural affiliation, reference (author and date of investigation), and any relevant comments. These data could then easily be tabulated and published on a regular basis and, in the interim, made available to interested researchers. Turnbow (1981) has compiled such a valuable listing of radiocarbon dates from sites for the state as a whole.

Only as we begin to define viable local archaeological phases, delineate their relative and absolute dates, and examine their relationship to other archeological units can we hope to begin the task of building local chronological sequences with the ultimate objective of providing a foundation for further study. Once the diagnostic artifacts for each temporal unit have been clearly defined and each unit has been placed in time by absolute and relative dating methods, an examination of the distribution of each archeological unit across space will be feasible. Thus, with the temporal and spatial parameters of regional archeological units defined, more sophisticated research topics directed at investigating aspects of settlement patterns, human adaptation, and economic strategies may be addressed.

2. Reconstructing Past Lifeways

The reconstruction of past lifeways constitutes a second objective of contemporary American archeology (Thomas 1979:137).

The reconstruction of past lifeways may subsume a great number of problem domains such as paleoenvironmental reconstruction, technological, and functional analyses; population dynamics, social organization; bioarcheological studies; and settlement-subsistence research. Along with the information collected for cultural historical questions discussed in the previous section, certain basic information must be collected and analyzed before lifeway reconstruction studies can be undertaken. Site types and site functions must be identified for each cultural/temporal archeological unit prior to the description of settlement patterns, and the examination of population dynamics. Floral and faunal data must be collected for each unit and analyzed in order to identify subsistence strategies. Information about the utilization of other natural resources such as chert, steatite, and the places where they can be procured must be collected. Burial populations must be examined in order to identify genetic pathologies, or pathologies which stem from interaction with the environment. Models of population dynamics, settlement-subsistence, and trade and exchange cannot be formulated without these kinds of information, information which is generally lacking in the Eastern Mountains data base.

A number of researchers in the past few years have developed settlement-subsistence models to explain archaeological data based upon ethnographic analogy (Beardsley et al. 1955; Yellen 1977; Gould 1978). These models are built upon typologies of settlement site types, especially the dichotomous relationship between functional differences of base camps versus extractive special activity loci. Moreover, each model tends to focus on four major subsystems: subsistence, site location, population dynamics, and technological analyses. Raab (1979: 132-140) has succinctly described a number of problems associated with such models, including false assumptions regarding the paleoenvironment predicated on observations of the present environment, misconceptions regarding cultural stability, simplistic expectations of human behavior, a lack of understanding regarding site formation processes, and the absence of archeological visibility for many human activities. To be successful, the settlement-subsistence model(s) one chooses to espouse must provide insight into the environmental conditions, social organization, or technological requirements that are responsible for producing these economic strategies.

Recent research on the Nunamiut Eskimo (Binford 1978, 1980) has revealed two distinctive subsistence strategies for hunter-gatherers which appear to be supported by studies of the African Bushman - another hunting/gathering people (Silberbeuer 1972). These two strategies, termed Foragers and Collectors, focus upon the distinction between moving entire groups of people to the subsistence resource versus a "logistically organized" subsistence strategy whereby specialists locate, procure, process, and transport subsistence resources to a larger social unit. Binford's hunter-gatherer model is offered here as an example of the kind of model which may eventually be tested with data collected from the Eastern Mountains. These models cannot be tested, however, without first collecting the necessary data, identifying the site types and settlement pattern for each archeological unit, and outlining the subsistence strategies pursued. Binford's model will be presented as three hypotheses to be tested.

Hypothesis #1: The prehistoric inhabitants of the project area adhered to a "collector" subsistence strategy.

Implications:

The "collector" subsistence strategy model presented by Binford (1980) centers upon five site types. These include "residential bases" and "field camps" (with the greatest archeological visibility), and "locations" and "stations" (with the least visibility). An ancillary, but recognizable, site type includes "caches."

"Residential bases" represent semi-permanent habitation sites from which task groups originate and are the locus at which most processing, manufacturing, maintenance, and social interaction takes place. Such sites will be located in favorable locations in terms of fairly level living space sufficient for a large number of people, and in close proximity to permanent water. In contrast, "field camps" represent temporary habitation sites where the task group maintains itself while away from home. It is important to note that both of these site types are habitation sites and are different, in general terms, only in the length and intensity of occupation. "Locations" are loci in which specific task groups conduct extractive activities such as hunting, butchering, collecting, and quarrying of tool stone. "Stations" are sites where task groups gather information relative to a proposed activity, e.g., the observation of game movement by a group of hunters. Finally, "caches" are the loci at which specific resources are stockpiled for later use. Such sites may appear in any combination with the other site types or in isolation (Binford 1980:10-12).

"Residential Bases"

Because these sites represent the locus at which most processing, manufacturing, maintenance, and social interaction takes place, it is assumed that such sites will display the greatest intrasite variability of any site type within the settlement system. Stated another way, the greater the number of functions a site may serve, the greater the diversity in tool forms and cultural features that will be present. "Residential bases" should reflect a high density of artifacts and cultural features such as midden staining, graves, hearths, fire-cracked rock, post molds, daub, and caches (storage pits). Lithic debitage should include evidence of early stages in the manufacuture of stone tools made from both local and non-local tool stone.

A wide variety of tool forms will also be present. These may include woodworking tools such as adzes, celts, mauls, axes, steep-edged end-scrapers, and food processing tools such as scrapers, knives, manos, milling stones, nutting stones, mortars, and pestles. Bone tools such as hairpins, awls, fish hooks, and projectile points may also be present. "Residential bases" should be located in favorable locations relative to the living requirements of a sizeable group of people, i.e., level ground in close proximity to a reliable water source.

"Field Camps"

"Field camps" will often be difficult to distinguish from residential bases because the major differences between the two site types centers upon length and intensity of occupation and numbers of inhabitants. "Field camps" however, should be oriented toward the specific extractive activity in which its inhabitants were engaged. It is expected that "field camps" will contain less diversity of tool forms and possibly more multi-purpose unspecialized tool forms than observed in "residential bases."

A hunting-oriented "field camp" might be expected to contain a large relative frequency of biface thinning flakes, preforms, butchering tools, retouch flakes, and projectile point/knives. A "field camp" oriented toward harvesting acorns and hickory nuts in contrast should exhibit plant processing tools such as mortars and pestles. If wooden tools were used in exploiting the nut mast, broken and exhausted woodworking tools may be present.

"Field camps" should be located in close proximity to the target resource, i.e., "field camps" housing people seeking nut resources will be near those areas in which one would expect high nut productivity. There is no reason to believe

that such sites must appear segregated across space, and, to the contrary, it is highly likely that field camps may be spatially and temporally super-imposed. "Field camps" are characterized by the lack of permanent structures, the presence of hearths, evidence of a narrow range of debitage types and tool forms, and a high relative frequency of retouched (re-sharpened),broken, and/or discarded tools. A high relative frequency of used but unmodified flakes of locally available stone should also be found at "field camps". It must be noted, however, that the cultural assemblage of "field camps" will vary greatly according to the target resource and the season of occupation.

"Stations" and "Locations"

By the very nature of the activity they represent, "stations" are expected to have a very low archeological visibility, and only in the most unusual of circumstances will such sites be represented in the settlement system. "Locations" are similarly difficult to detect because they represent activities of relatively short duration. The function of locations is difficult to ascertain because they rarely contain diagnostic artifacts and tend to be very limited in terms of sheer numbers of artifacts. Such sites are difficult to locate due to their low archeological visibility, relating to heavy vegetation and the consequent lack of ground visibility. Most frequently, they are recognized in plowed areas, road beds, or similarly disturbed areas where the vegetation has been removed. Because it is often not possible to assign these sites to any particular temporal period, they have long been ignored by professionl archeologists. Individually, the small lithic scatter or isolated find offers no immediate value, but their distributional patterns across space may reveal significant information regarding past subsistence systems. For example, ethnographic observation and experimental archeology has indicated that primary flakes with unmodified (unworked) edges make more efficient cutting tools than those with prepared, retouched cutting surfaces. Such "tools" are usually made and discarded at the locus where they were used.

"Caches"

As stated previously, the storage of food and other resources is the mechanism which allows a "collector" subsistence strategy to endure over time. The storage of critical resources allows people to "overcome the natural rhythms of availability" (Cleland 1976:62) and permits a more sedentary, secure lifeway. This is true not only for peoples who depend upon hunting-gathering-collecting for their subsistence requirements but also for prehistoric

agriculturalists. "Caches" may appear in isolation or in combination with the other site types. In fact, "caches" represent integral elements of both "residential bases" and "field camps."

Food storage facilities will appear as subsurface features in habitation sites. These features will usually be distinct in their organic discoloration of the site matrix. Foodstuff "caches" may be lined with rock or lined with bark and leaves (cf., Funkhouser and Webb 1929:46-48). "Caches" should differ from general refuse pits by a relative absence of normal midden materials such as lithic debitage and sherds (cf., McMillan 1965:44). The size and shape of food "caches" will vary greatly depending upon the volume of foodstuffs stored and the nature of this material (nuts, seeds, roots, or berries). The ethnographic record provides ample evidence of the technologies used for harvesting, transportation, storage, and preparation of food resources such as nut mast (Swanton 1976; Hudson 1976; Campbell 1959). The ethnographic record also indicates that certain storage facilities may not be represented (e.g., elevated granaries). It is frequently very difficult to determine the nature of a "cache's" contents due to the preservation potential of most foodstuffs. Our best evidence of prehistoric diets is the data generated from coprolite studies (cf., Watson 1969; Watson and Yarnell 1966). Palynological studies and the examination of vegetal remains (Jones 1936; Wood and McMillan 1969) offer important alternatives to the study of foodstuff "caches."

Another common type of "cache" is lithic. Because lithic "caches" most frequently contain large, thin, bifacially flaked tool preforms or blanks, it is very difficult to assign them to a specific cultural period when found in isolation. As Tunnell (1978)suggests, however, good quality tool stone is not always available in food-hunting territory and does not always correspond to other requirements for habitation sites. There can be no doubt that high quality stone was regularly sought after and curated by aboriginal peoples. The importance of lithic "caches" must not be underestimated. Their contents provide "direct evidence of where stone was being acquired, how it was pre-formed for transport, the quantities of it that were carried, and the distances and directions it was being moved" (Tunnell 1978:40).

Hypothesis #2: The prehistoric inhabitants of the project area adhered to a "forager" subsistence strategy.

Implications:

Foragers normally do not store food but, rather,gather it on a daily basis. According to Binford (1980:5), they tend

to organize resource exploitation by a series of residential moves and adjustments in group size. Binford's (1980) observations suggest that foragers "...range out gathering food on an 'encounter' basis and return to their residential bases each afternoon or evening." A critical variable which would allow such a subsistence strategy is a stable environment in which there are a wide variety of resources to exploit on a predictable seasonal basis. Binford (1980:5-10) suggests that in areas where critical resources are readily available and evenly distributed, the number of residential moves by foragers may be increased although the distance between residential bases may be reduced. Conversely, if the same resources are dispersed, the size of the foraging group will be reduced and the distance between residential bases will increase. In situations where critical resources are extremely localized, one might expect a great deal of redundancy in site occupation from one annual cycle to the next. Variability in intersite assemblages are thought to be a reflection of variability in seasonal scheduling activities and the relative intensity of occupation (i.e., group size and duration of occupation). Binford (1980:9) recognizes two different types of archeological sites which would represent a forager subsistence system: 1) residential bases and 2) locations.

As Binford (1980:9-10) suggests, the implications for archeological sites representing such a subsistence strategy center upon a high visibility for "residential bases" where repeated occupations occurred in the course of successive seasonal rounds. Such sites should display a broad array of socioeconomic activities, inferred from a highly varied intrasite structure, and a similarity between sites located throughout the settlement system and across different environmental zones. Conversely, "locations" or extractive sites representing functionally specific activities should be under-represented due to their low archeological visibility. "Locations" represent the loci at which foragers "encounter" a specific resource (e.g., a turtle is dispatched and taken back to the residential base). Presently available archeological evidence suggests that Binford is correct concerning the low visibility of such extractive sites. Wheat (1967) recovered only 47 artifacts from the Olsen-Chubbuck site where almost 150 Bison occidentalis were stampeded into an arroyo and butchered. With this fact in mind, the cultural material left by Archaic hunters killing and butchering one or even a few deer must be minimal indeed!

Hypothesis #3: Both "forager" and "collector" subsistence strategies are reflected in the archeological record.

Implications:

The archeological record may reflect temporal distinctions between strategies employed, i.e., particular subsistence strategies may describe particular cultural-temporal configurations.

In reviewing the two models proposed, we can isolate key components that allow us to determine which model may provide the best explanation for eastern Kentucky archaeological sites' configurations. Binford (1980:12) acknowledges that the site types in his models are not mutually exclusive and that:

> the greater the number of generic types of functions a site may serve, the greater the number of possible combinations, and hence the greater the range of intersite variability we may expect.

A forager strategy will be reflected by a great deal of intersite and intrasite similarity across environmental zones. The vast majority of sites identified may reflect reoccupation of the same residential bases on a seasonal basis, and such sites should be located very near the target resources of the site's inhabitants. Other kinds of sites such as extractive "locations" will be under-represented or absent.

In contrast, a collector strategy will be reflected by two highly visible site types: "residential bases" and "field camps." The former will not necessarily be located near the primary subsistence base for the main social unit, but,rather, an emphasis will be placed upon the maintenance requirements for a large group of people such as level ground, a stable water supply, and fuel. "Field camps" will display some similarity to residential bases but will be smaller in size and will be located near target resources. In addition, "field camps" will display less intrasite variability than "residential bases." Another key component which would suggest a collector strategy is the presence of "caches" in the settlement-subsistence system. The storage of food and other resources is the mechanism which allows such a strategy to exist. By their very nature, and for the reasons mentioned previously, "stations" and "locations" will be under-represented in the archeological record.

If information is accumulated to test these hypotheses, a data base will eventually be developed that will allow for the construction and testing of more refined models for future investigations. In this manner, our understanding of past settlement patterns will become increasingly sophisticated, and we will be able to accurately reconstruct past lifeways. Eventually, we will also obtain the necessary data to develop theories concerning culture change

and process.

3. Culture Process

Given an adequate culture historical foundation, archeology is thought to be particularly well-suited to contributing theoretical and empirical data regarding patterns of diachronic variability that the more synchronic, cultural anthropological analyses are unable to address. The third objective that Thomas (1979) outlined for archeological research is the investigation of culture process, i.e., the explanation of diachronic processes in human behavior with a particular emphasis on variability in ecological, functional, cultural, sociological, and other systemic observations. The goal is to explain variations in human behavior rather than to merely describe various aspects of material culture. Processual archeologists view

> human behavior as a point of overlap (or articulation) between vast numbers of systems, each which encompasses both cultural and non-cultural phenomena...culture change comes about through minor variations in one or more systems, which grow, displace, or reinforce others and reach equilibrium on a different plane (Flannery 1972: 103-104).

In a general sense, then, culture process is not so much concerned with the examples as it is with tracing the development of these cultural patterns over time and attempting to provide testable hypotheses regarding the causal factors for change or continuity. Eastern Kentucky's prehistoric cultural resources hold the potential for examining a number of processual topics, once the descriptive and comparative foundation has been laid. In this section, three topics are discussed which appear to be particularly applicable to research efforts in eastern Kentucky: development of plant domestication, processes of cultural stability and conservatism, and the relationship between environmental change and culture change.

The many rockshelters in eastern Kentucky are particularly well-suited to investigations centered on examining the introduction of plant domestication due to their demonstrated preservation potential. Answers to questions relating to why and how domesticates were introduced and accepted, what cultural accommodations resulted, and what the long-term effect of plant domestication was on Late Archaic, Woodland, Fort Ancient and Mississippian cultures would be used to draw conclusions regarding the role of domesticates in cultural evolution.

Eastern Kentucky's Woodland populations,like those in the Ozarks in Missouri (Roper 1979b), have been interpreted as relatively stable, even backward, when compared to Adena and Hopewell manifestations in adjacent areas. If archeologists were able to understand the reasons for this cultural stability, the results would have tremendous implications for understanding Adena and Hopewell cultural elaboration. In her investigation of culture change versus stability in the Ozarks, Roper (1979b:39) has indicated that:

> Cultural conservatism or stability can...be seen as continuity in the configuration of a system. This may result from the lack of external stimuli, from accommodations to those stimuli in a manner that requires or leads to little change elsewhere in the system, or from an inability to adapt to changes necessitated by external stimuli and therefore either a collapse of the system or a rejection of the potential change.

The attributes and attribute clusters of artifacts, features, and sites defined for any given archeological phase may also include the evidence of external stimuli to which Roper has referred, i.e., "exotic" materials in the ceramic or lithic assemblages, architectural features, or trade items. How widespread are distributions of such exotic materials? What do these distributions reflect with regard to group interaction and trade? Can the cultural continuity of the archeological record in eastern Kentucky be attributed to cultural isolation, or does the rugged environment play a more important part?

While the environment is viewed as playing a role in cultural development, data from eastern Kentucky can shed more light on the environment-culture inter-relationship due to the climatological data present in the dry rockshelters. Jochim (1976) has indicated that, under stable environmental conditions, culture changes are expected to focus on maximizing energy extraction potential, population aggregation (at least on a seasonal basis), and population security. Conversely, when the climate fluctuates more than what might be considered normal, the resultant stress on cultural systems leads to increased experimentation, culture change (adaptation), or collapse. Processual studies designed to examine diachronic variability of population size and structure, settlement patterns, subsistence practices, artifact and ecofact densities, procurement and processing technologies, and other lines of evidence may be applied to investigate the relationship between environment and culture in the Eastern Mountains.

A number of research hypotheses both general and specific could be forwarded at this point. The following questions represent only a sample of the many possible research issues

which could be examined in eastern Kentucky:

1.What are the diagnostic characteristics of the artifact assemblages for each local archeological unit?

2.What are the local cultural developments? Can drainage systems be used to structure the definition of these developments?

3.What are the regional cultural developments for the Eastern Mountains as a whole?

4.What are the diagnostic site types for each local archeological unit? What types of settlement systems existed in the Eastern Mountains region during each of the defined cultural periods?

5.Can population density be calculated for the region during each cultural period? Can population movements into and out of the region be documented?

6.What evidence of trade and exchange can be identified for the region? What were the routes used for trade and exchange, and did these routes change over time?

7.What was the relationship between the Eastern Mountains population and the Adena/Hopewell developments within and outside the region?

8.Why do particular chert resources appear to have been utilized during one cultural period, but not in other cultural periods? Can this phenomenon be explained by denied access to resources, population movement, cultural preference?

9.Can ethnographic Indian groups be identified in the archeological record of the region? Can ethnic/tribal boundaries be identified in the Eastern Mountains archeological record?

10.What were the climatic conditions for each cultural period? What kinds of resources were available, and which were exploited during each cultural period? Can recognized Holocene climatic changes be used to interpret cultural developments in the Eastern Mountains?

11.What can the information concerning plant domestication in the Eastern Mountains offer for our understanding of the processes of and cultural

changes associated with plant domestication?

12.What kinds of models can be developed concerning culture change from the Eastern Mountains archeological record?

In summary, research questions for eastern Kentucky should focus upon meeting three major goals: outlining the region's cultural historical developments, reconstructing past lifeways, and explaining cultural processes. These goals should be approached in sequence for successful research. Presented below is an outline of major research objectives which should be met in order to realize the three goals:

1. Culture History
   - A. Identify all sites in the project area.
   - B. Identify and define archeological units (components, phases, and/or complexes).
   - C. Determine the absolute and relative dates for each unit.
   - D. Build local chronologies.
   - E. Develop regional syntheses.

2. Reconstruction of past lifeways
   - A. Define the spatial boundaries of each archeological unit.
   - B. Define function(s) of each site and each unit.
   - C. Integrate site data into testable settlement/subsistence models.
   - D. Reconstruct the paleoenvironment for each cultural period.
   - E. Reconstruct the paleodemography for each cultural period.
   - F. Identify trade and exchange networks.

3. Explanation of culture process
   - A. Analyze the observed temporal and spatial variability in the cultural record.
   - B. Generate new theory to refine existing models.
   - C. Develop testable models of culture change.

The use of the term "archeological unit" in the outline presented above may refer to archeological components, phases, horizons, and/or traditions, depending upon our level of understanding for any given sub-region or local sequence that has been defined.

Prehistoric research in Kentucky's Eastern Mountains holds the potential for answering a number of important questions related to cultural developments in the Eastern Woodlands of North America. Unfortunately, an enormous amount of basic descriptive and comparative research

approached in a systematic and rigorous manner must be conducted in order to lay the foundation for future studies directed at lifeway reconstruction and the explanation of culture process. Enlightened management of the cultural resources on FMO lands will help protect these valuable cultural resources, and provide the basic information needed to understand the region's cultural developments.

C. HISTORIC RESOURCES PROBLEM DOMAINS

The term "historic resources" is interpreted here to include non-aboriginal sites which display evidence of architecture or obvious historic period features such as wells, cisterns, root cellars, trash dumps, field-clearing stone walls, and dams. Fontana (1978:23-26), however, suggests that historic sites may be classified in a sequential arrangement of types that parallel cultural developments during the historic period: protohistoric, contact, post contact, frontier, and non-aboriginal. Protohistoric sites refer to aboriginal sites in which there is evidence of Euroamerican trade goods but which were occupied prior to contact with non-aboriginal peoples. Contact sites are those aboriginal sites which were visited by non-aboriginal peoples. Post contact sites are aboriginal sites that did not exist during prehistory or the two previous periods but which were inhabited by aboriginal peoples. Frontier sites refer to non-aboriginal sites such as military posts, trading posts, and some colonial settlements. These sites, although inhabited by Euroamericans, reflect a great deal of interaction with aboriginal peoples. Finally, non-aboriginal sites are essentially non-Indian and include the balance of historic period sites such as farmsteads, mining towns, villages, cities, etc. In this discussion, we are primarily concerned with the latter two classes of historic sites.

The research goals discussed in Section B of this chapter are applicable to the historic archeological data base. An additional source of information is available from historic archeological data, however, because of the wealth of complementary information contained in federal and county records, and other published and unpublished sources such as accounts by travelers and long-time area residents.

Historic archeology is perhaps one of the best forums in which to examine culture change and socio-cultural integration because of the expanded information pool contributed by these documentary sources, and the firmer chronological control the historic archeologist has over his data. Other problem domains may include the functional analysis of artifacts, features, and sites to determine community settlement patterns. In an attempt to reconstruct subsistence, economic, and social networks,one might examine

agricultural resource utilization patterns, trade, technology, and demographics. Another particularly interesting research topic for study in eastern Kentucky might focus on historic industrial complexes such as the historic iron works, niter mines, or early coal mining complexes.

C.R. Price and J.E. Price (1978a:10) have described three general types of historic sites which appear to be applicable in most of the southeastern United States and acknowledge that these historic sites probably coexisted:

> 1. Hunter-Squatter. Often the first settlers in an area were those which contemporary nineteenth century writers called "backwoodsmen" or "squatters" (James 1972:516; Schoolcraft 1821, 1853; Babcock 1964:101; Engleman 1929). Settlers were highly mobile, and subsistence was based on hunting, trapping, and trading, with little, if any, emphasis on agriculture.
>
> 2. Subsistence Farmer. These settlers practiced subsistence agriculture and participated only marginally in a market system. Often a mixed farming-herding strategy was employed involving a multi-crop/animal complex. The unit of labor was the family, the families occupying dispersed nuclear family farmsteads.
>
> 3. Planter. The plantation system was based on intensive commercial agriculture, centering on the production of usually one cash crop, active participation in a widespread market economy, and the exploitation of a non-free labor force.

Hutchinson et al. (1982) have recently applied Price and Price's site type classification to the study of vernacular architecture in McCreary County, Kentucky. This study suggested that these site types may be "overly simplistic in the sharp contrast...between the hunter-squatter and the small-scale agriculturalist" and that "an evolutionary continuum with a gradual increase over time in the reliance on domesticates, particularly corn, hogs, forage crops, and cattle" (1982:143) may be a more precise interpretation.

C.R.Price and J.E. Price (1978a,b) also discuss a locational model of historic settlement in southeast Missouri that may be applicable to eastern Kentucky historic settlement. It is discussed here as a potential model for testing with the eastern Kentucky historic sites data. This locational model is based upon the nuclear family farmstead as the most basic unit within a larger historic settlement pattern. These nuclear farmsteads appear with the earliest settlers in the area and are characterized by self-

sufficient food production and an emphasis on raising corn and hogs, with some hunting and trapping. These initial settlers distributed themselves across space in family-related clusters, apparently as a result of moving to frontier areas in family groups. Space was necessary between farmsteads because of the competition for natural resources.

Price and Price identified two factors which they felt played a major role in the selection of historic farmstead locations: 1) access to natural resources, and 2) access to established trading and communication networks. Therefore, the pattern that emerged from their study was one in which the earliest historic settlements occurred along pre-existing transportation routes. The region's population increased, new transportation routes were established, and new settlement patterns emerged. Price and Price identified the general trend in their study area as consisting of initial settlement in the highland stream valleys along the Natichitoches Trace, a major overland road which probably was used in prehistoric times. Later settlement occurred in valleys and lowlands with ridge top localities being the last areas to be settled.

With regard to J.E. Price and C.R. Price's (1978a) locational model for historic settlement, Hutchinson et al.'s (1982) data from McCreary County, Kentucky indicate that the general patterns of change recognized in the model do seem to fit the evidence. Hutchinson et al. (1982) recognized four architectural arrangement patterns along the Big South Fork of the Cumberland River which are thought to be sequentially ordered. These include the "Dispersed Hollow," "Planned Linear," "Clustered Informal," and "Semi-dispersed Ridge Top" patterns. Hutchinson et al.'s (1982) criticisms notwithstanding, the model for historic site locations proposed by J.E. Price and C.R. Price (1978a) may serve as a basis for future historic research in the Eastern Mountains. New models may also be developed with the eastern Kentucky data for testing elsewhere.

A great many early trading and communication routes were located in eastern Kentucky, which fulfills one of Price and Price's requirements for their historic settlement model. Future researchers working in eastern Kentucky should be aware of the location of these early routes and consider the implication of Price and Price's model with regard to the location and classes of historic sites that may be expected to occur in this region.

D. SITE DISTURBANCE

Site disturbance is not a research problem domain in the same sense as those problem domains discussed in Sections B and C. Nevertheless, site disturbance is included in this chapter to underscore the seriousness of site disturbance and vandalism which occurs in the Eastern Mountains (especially in the dry rockshelters). In this section, a strategy is presented for collecting quantifiable data regarding site impacts in order to provide agency management officials with an objective measure of site damage and a vehicle by which damage may be monitored.

Information regarding site disturbance has only recently been required on the Kentucky Archaeological Site Survey Form. Ison et al. (1980) in their investigation of vandalism in the Red River Gorge reported that, of the 493 rockshelter sites in eastern Kentucky listed in the OSA state archeological site files, 289 contained site disturbance. It is an understatement to say that vandalism of archeological sites is a difficult-to-solve management problem. Nevertheless, neither the archeological community nor land managers are aware of the extent to which sites are being impacted by vandals or by other equally distructive natural or cultural forces.

The only way legitimate recommendations designed to control impacts to archeological sites can be made is to obtain quantifiable baseline data. All future studies in the project area should thus incorporate some degree of site impact/vandalism analysis into project-specific research designs. We emphasize that, for each new recorded site, the extent of surface disturbance is important data and should always be recorded on the Kentucky Archeological Site Survey Form. A detailed photographic record of each new site would be particularly useful to this end, especially if this record were filed with the attendant site forms at the Office of the State Archeologist. The presumed cause of the disturbance should also be stated explicitly. Quantifiable data regarding impacts to archeological sites may be obtained by hypothesis testing similar to that described in Chapter V, Section B.

Hypothesis #1: There is a direct relationship between the amount of site disturbance and the type of impact to the archeological resources. Arranged in order of decreasing seriousness, these include: strip mining, vandalism, deep mining, other forms of excavation and earth moving (e.g., timber sales, oil and gas development, linear construction projects such as pipelines and transmission lines), natural forces, and all other forms of impact not listed.

Implications:

These various forms of impact are easily recognized when observed on the surface of archeological sites. During the course of field survey, data regarding the nature and extent of damage to the surface of archeological sites should be recorded. Surface damage should be measured in square meters. By emphasizing surface disturbance, we do not mean to imply that we are unconcerned about the overall volume of impact on a given site. The difficulty of estimating the volume of earth that has been disturbed, however, is frequently beyond the ability of those conducting surveys. It is thought, therefore, that surface disturbance remains the most expedient estimate of site damage.

Hypothesis #2: Vandalism is most serious in high traffic areas with easy access, and least serious in remote areas of Eastern Kentucky where access is restricted.

Implications:

During the course of field survey, data regarding the proximity of sites to campgrounds, foot paths, roads, and rivers used for canoeing and other recreational uses should be collected. These data, correlated with site impact estimates, may be used to rank recreation areas and assess the impact of these routes. It is assumed that sites located in easily accessible regions will be more severely impacted by vandalism than those situated in more remote areas. If this is the case, specific management recommendations to limit access to certain areas may be appropriate.

Hypothesis #3: Vandalism is most serious at large sites which are rich in cultural materials and which contain obvious cultural features such as middens.

Implications:

The proposed relationship may be verified or refuted by a comparison of field survey data on vandalism and that gathered on site size, nature, and content.

Effective cultural resource management demands not only quality research in the traditional sense, but also applied research. The site impact analysis presented above is intended to provide a springboard for collecting data designed to meet management objectives. By presenting the data collection techniques in the form of hypotheses, management problems such as site disturbance can be approached in a scientific manner, and therefore options available to resource managers may be more critically

evaluated. It is rational to assume that wise and prudent management alternatives would be necesssarily restricted without an understanding of the impacts and a way to monitor the on-going effects of any given form of site disturbance. Perhaps the most important aspect of recording site disturbance is the fact that field archeologists can accumulate quantifiable or tangible evidence with which to approach agency decision makers. Armed with such evidence, the chances of management officials initiating a protection program are greatly enhanced.

VI. MANAGEMENT RECOMMENDATIONS

A. INTRODUCTION

In a recent paper entitled "Standards for Planning in Context," King (n.d.) has identified specific planning components necessary for the comprehensive identification, evaluation, and treatment of archeological and historic properties that may be affected by federal undertakings, especially those connected with mineral development. The keystone for efficient management of such properties is a cultural resource overview. This component has been presented in Chapter III. In this chapter, the other necessary planning elements will be addressed as they relate to the Eastern Mountains. These include 1) identification strategies, 2) evaluation system, 3) treatment strategies, and 4) recommendations for implementation and monitoring.

B. IDENTIFICATION STRATEGIES

King (n.d.:7) suggests that identification strategies should address two major objectives: 1) predicting the nature, distribution, location, and density of historic and archeological properties that occur in the project area; and 2) establishing methods for additional identification and documentation of previously unrecorded properties.

There is an overwhelming need to obtain accurate information on the densities and distributions of archeological and historic properties throughout the project area, for the professional community and for the land-managing agency officials alike. Unfortunately, the existing data base in the study area severely restricts any attempt to fully address the first of these objectives. If BLM wishes to address the objective of predicting the nature, distribution, location, and density of historic and archeological properties, certain prerequisites must be met. A statistically valid sample of the Eastern Mountains region must be surveyed (Pollack 1981:63; Collins and Brooks n.d.), and initial site location predictions must be formulated for later testing. The appropriate survey sampling unit and sample size for the 150,000 acre FMO land holdings in eastern Kentucky must be selected in order to ensure success of the predictive model. An appropriate sampling unit and sample size should be derived from a consensus of archaeologists familiar with the region's history and prehistory. Due to budgetary constraints, it is acknowledged that such a survey may have to be implemented in annual increments.

A number of different survey sampling units can be selected for use in developing a model for predicting site location. Given the specific characteristics of any individual study, transects, hexagons, or quadrants may be useful. Pollack (1981) has proposed an approach which centers upon cluster sampling of one-kilometer-square quadrants.

Once the sampling units have been selected and surveyed, a number of units of analysis can be selected, again with the specific characteristics of the particular study in mind. Roper (1979a:119-142) has proposed to examine the environmental situation in which sites are located. Catchment analysis is a term borrowed from geomorphology which refers to "that area from which a site (or more properly, the inhabitants of a site) derived its resources" (Roper 1979a:120). Beyond catchment analyses, any one site represents only a small portion of a settlement system of which there may be multiple settlement patterns. Like settlement systems, settlement patterns vary according to environmental diversity and to the cultural/temporal units under study.

Pollack (1981) has suggested that the unit of analysis be the quadrant. The assumption is that the greater environmental diversity a quadrant exhibits, the greater the likelihood that sites will be found in the quadrant. Pollack suggests that a ranking scheme could be developed with respect to environmental diversity within quadrants examined (1981:70). The correlation between site types and/or site densities and environmental diversity could then be employed to determine the sensitivity of unsurveyed quadrants, i.e., maximum, intermediate, and least likely for site location.

The statistical tests to be applied to the data would necessarily depend on the nature and size of the sample as well as the researcher's objectives, but

> Factor analysis can be used to compare survey quadrants to determine which exhibit similar environmental characteristics. Other factor analyses could be run using the same units of analysis but including cultural variables to determine if they tend to be correlated with specific environmental variables. Factor analysis could also be run on the "site" and "situation" data sets to determine if sites of different temporal periods or functions exhibit the same relationship with respect to the physical environment. As more information is collected, the analysis could be reversed and discriminant techniques could be applied to the data. Survey areas could be grouped into those containing sites

> and those without sites. These two groups could then be compared to determine if they exhibit different environmental characteristics (Pollack 1981:71).

Pollack goes on to suggest that, if site location can be correlated with certain environmental variables, then discriminant function analyses could be applied to unsurveyed areas for which environmental data was available. He cautions that the ability to make site location predictions and the reliability of these statements is directly proportional to the size of the sample that has been surveyed. On the other hand, these predictions can be expected to increase in reliability as additional investigations are conducted in the study area.

Although Pollack (1981) fails to explicitly define those environmental and cultural variables he deems important to be collected to develop predictive site location statements, a number of sources are immediately available. Limp's (1978) ORACLE system provides a more than adequate foundation. The Kentucky Archaeological Site Survey Form also includes a number of variables which are important. These variables, with some modification, are presented in Table 7. These are thought to represent the minimal information to be recorded regarding the location of each new site discovered in the survey area. It should be noted that variable 11 has been considerably modified from both the Kentucky Archaeological Site Survey Form and ORACLE requirements to allow a more precise coding of topographic variability. Similar modification of variable 12 is also required.

Cultural variables to be recorded for each site include a description of each site's physical, and cultural/temporal characteristics, as well as other pertinent information. These variables should include:

1. Site size (horizontal and vertical dimensions)
2. Site type,
3. Site function,
4. Intrasite structure,
5. Material culture,
6. Cultural affiliation, and
7. Nature and extent of previous disturbance

It is important to note that this list represents minimal information requirements and in no case should be interpreted as a limiting factor for site recording. Variables similar to these are included in the ORACLE system and on the Kentucky Archeological Site Survey Form.

Once the predictive model is prepared, small survey projects may be treated as individual sampling units,

Table 7. Predictive Modeling Environmental Variables.

1. UTM northing and easting
2. Major watershed
3. Closest named water source
4. Hydrologic type of nearest water source
5. Class (stream rank order in the Strahler system)
6. Presence of nearby stream intersection (<= 200 m)
7. Direction to nearest water
8. Distance to nearest water
9. Elevation
10. Soil Series
    a. soil underlying site or locality
    b. dominant soil within a 2000 m radius of site or locality
11. Topographic-geomorphologic setting
    a. natural levee
    b. flood plain
    c. floodplain terrace remnant
    d. terrace
    e. talus
    f. hillside
    g. bluff base
    h. terminal ridge spur
    i. linear bluff top
    j. head of gully
    k. upland flat
    l. watershed saddle
    m. upland terrace remnant
12. Vegetation
13. Slope
14. Aspect

although archeologists are not in agreement concerning the validity of this approach. The results of such small-scale investigations can then be incorporated into the regional sampling design. The necessary prerequisite for analysis lies in the standardization of data variables to be recorded. It is recommended that investigators conducting surveys in the study area in the future be required to gather comparable data that have utility for testing the predictive model.

The archeological literature for eastern Kentucky, except very recently, contains little information regarding methods and techniques employed for additional identification and documentation of previously unrecorded properties, King's second objective for identification strategies. Site discovery is a function of the interplay between a number of factors, such as:

a)how much land surface in the project area is obscured by vegetation;

b)cultural factors such as vandalism, urban encroachment;

c)field techniques employed to locate sites;

d)average size of sites in the project area;

e)average density of cultural materials within sites and their distribution.

Because of heavy vegetation in most localities within the project area, we have no way of appropriately assessing the degree to which recorded sites represent the totality of archeological resources in the area. This is true for surveyed as well as unsurveyed areas. For example, if one were to assume complete vegetative cover and random distribution of artifacts on a site's suface, Table 8 shows the probability of site discovery using 30 cm x 30 cm shovel tests spaced at 30 meter intervals, with 30 meter intervals between crew members. These figures represent the product of total area contained in shovel tests, surface area of the site, and density of artifacts per unit area. Given these survey methods, the probabilty of discovering an isolated artifact is only one in 10,000.

Schiffer et al. (1978:4-10) have discussed other factors that affect site discovery: abundance, clustering, obtrusiveness, visibility, and accessibility. Abundance refers to the relative frequency of any particular site type with respect to the land area examined. Clustering refers to a phenomenon which may often be recognized in the archeological record where specific site types or associated site types tend to aggregate in specific localities. Some

Table 8. Shovel Test Probability.

Site Size (Hectares)	Artifact Density on Site Surface (assumes random distribution) 1/m2	5/m2	10/m2	20/m2
.10	.099	.495	.990	1.980
.25	.252	1.260	2.520	5.040
.50	.504	2.520	5.040	10.080
1.00	.999	4.995	9.990	19.980
2.00	1.998	9.990	19.980	39.960
3.00	2.997	14.985	29.970	59.940

* 30 cm x 30 cm shovel tests at 30 meter intervals.

Source: Environment Consultants, Inc. (1981)

site types are more obtrusive than others depending upon the survey technique employed. For example, sites containing surface structures such as architectural features may be more readily identified than a short-term, ephemeral, special activity sites used by Archaic hunters. Visibility is closely associated with obtrusiveness but is somewhat different in that it reflects the degree to which sites are hidden by natural and/or cultural factors. Although small sites are most greatly affected by obtrusiveness and visibility, large sites may also have low visibility (e.g., St. Albans Site in West Virginia). Chartkoff and Chartkoff (1980:10-25) discuss each of these factors and suggest that intensity of survey coverage, the ability of individual surveyors, and even crew morale may also contribute to problems inherent to site discovery.

C. SITE EVALUATION SYSTEM

King (n.d.:1,12) suggests that planning in context requires an "endemic evaluation system" that is based on the National Register criteria (36 CFR Sec. 60.6) but that is also meaningful in terms of the study area's prehistory or history. In some regions, significance statements may be intimately linked to contemporary cultural concerns (e.g. Native American sacred areas). However, since there are no resident Native American groups living in the study area, these cultural concerns will not be addressed in the following discussion. Significance statements will be addressed vis-a-vis the National Register criteria.

The National Register of Historic Places created with the enactment of the National Historic Preservation Act (1966), represents an inventory of districts, sites, structures, and objects that are determined to be significant on a local, state, or national level. The criteria by which properties may be determined eligible focus upon integrity of location, design, setting, materials, workmanship, feeling, and association. Properties that meet any one of the following criteria may be considered for inclusion in the National Register of Historic Places. They must be properties that:

> a)are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> b)are associated with lives of persons significant in our past; or
>
> c)embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose

components may lack individual distinction; or,

d)have yielded, or may be likely to yield, information important in history or prehistory (36 CFR Sec. 60.6).

It is important to note that archeologists cannot determine the eligibility of any property, but can only make recommendations regarding a site's potential for meeting one or more of the National Register criteria. A site can only be determined eligible for inclusion in the National Register of Historic Places through the process outlined in 36 CFR Part 63.

One procedure by which field archeologists may conclude whether or not specific properties may potentially meet National Register criteria is outlined in this section. Because the vast majority of recorded properties located on FMO lands in eastern Kentucky are archeological sites, the following four-step evaluation process is most applicable to this type of resource (Figure 8). Each phase of the process is intimately tied to the National Register criteria and focuses upon site extent, age, integrity of deposit, and research potential.

Step 1: Site Extent

The initial stage in evaluating any archeological site must center on determining its size, i.e., the horizontal and vertical extent of the cultural deposit. The size of a site, however, does not reflect its relative significance (c.f., Talmage and Chester; Tainter 1979) and small sites are not simply poor imitations of larger ones. Small sites frequently reflect unique activity sets that are unrepresented by other archeological manifestation (c.f., Chartkoff and Chartkoff 1980:15). Site size determinations are critical to proper evaluation and adequate description of the cultural deposit. If a site lacks subsurface deposits and its research potential has been exhausted by the collection of surface artifacts, it should not be considered "eligible." Adequate recording is all that is required. If a site's research potential cannot be exhausted by surface collection of artifacts, and when testing reveals discrete site limits, it should be considered for the next step in this process.

Step 2: Site Age

The second step in evaluating the National Register potential of a site centers on the age of the cultural deposit. This requires a good-faith effort to locate and analyze temporal indicators (e.g. projectile points and ceramics) or suitable data for absolute determinations (e.g., charcoal for radiometric dating or burned clay for

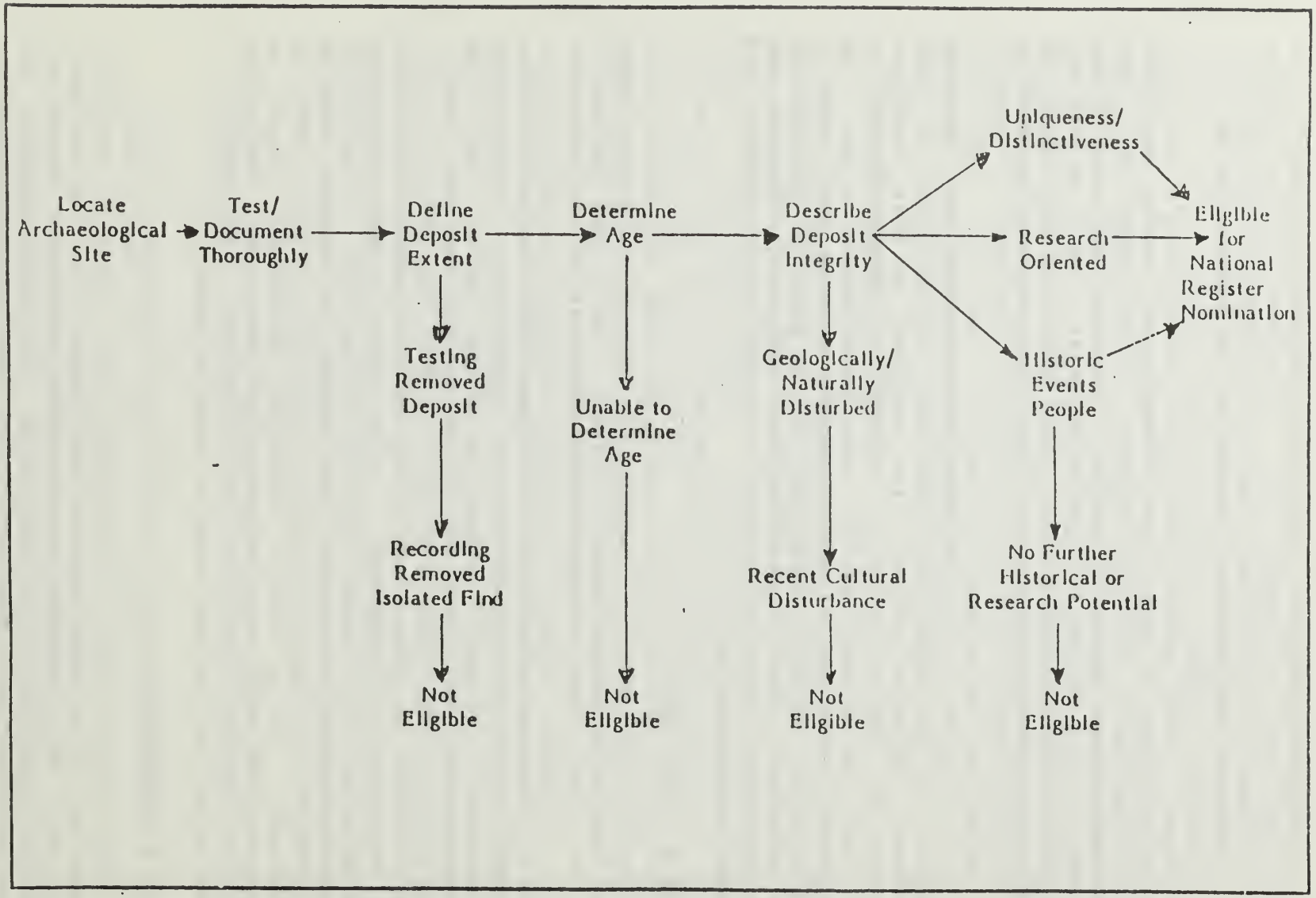

Figure 8. Flow Chart Illustrating the Four-Step Procedure for National Register Evaluations (after Bennett et al. 1982:22)

archeomagnetic dating). The staff of the National Register have recently published guidelines for the evaluation of properties in which they state explicitly:

> A property that cannot be related to a particular time period or cultural group, and that as a result lacks any comparative context within which to evaluate the importance of the information to be gained, is not eligible (National Park Service 1982:29).

Therefore, if a site fails to produce any indication of age, it should not be considered eligible, and thorough documentation is all that is required. If the age of a site can be determined, the site should be considered in the next step in the procedure.

Step 3: Deposit Integrity

The third phase of site evaluation is a direct result of attempts to define the extent of a site. If subsurface testing reveals that the context of a cultural deposit has been destroyed by natural or cultural agents (e.g., erosion, farming, vandalism), the site should not be considered eligible.

> A site which has been looted or otherwise disturbed to the extent that the remaining cultural materials have lost their important depositional context is not eligible... For properties important for their information potential, integrity depends on the presence of those parts of a property which contain the important data and which survive in a condition capable of yielding important information (National Park Service 1982:30,37).

Most archeological sites, if not all of them, are affected by post depositional disturbances such as those caused by animals, plants, people, freeze-thaw actions, etc. (cf., Schiffer 1976; Wood and Johnson 1978:315-383). Therefore, the integrity of cultural deposits must be acknowledged as a relative quality. Only those sites in which the context of important artifacts and features have been preserved should be considered for the final phase of the evaluation process.

Step 4: Uniqueness/Distinctiveness, Historical Events/People, Research Potential

The final step in the evaluation of historic and archeological properties provides the substantive basis for a recommendation that a site be considered for inclusion in the National Register. It is not sufficient for a site of known antiquity to possess discrete limits and documented

integrity for it to be considered eligible. It must also be unique, bear a direct relationship to significant persons or events that are important to local, state, or national history, or show a demonstrated potential to yield important information with regard to problem-oriented research questions (cf., Raab and Klinger 1977; Schiffer and House 1975; Schiffer and Gummerman 1977).

In the absence of a comprehensive Kentucky State Historic Preservation Plan prepared to provide guidance on what the state considers significant, the research questions presented in Chapter V have been written to this end. Therefore, any archeological site that has been considered through each of the successive steps outlined above and which has the potential to yield information important to the kinds of research questions posed in Chapter V should be considered for inclusion in the National Register of Historic Places. It is important to note that the Kentucky Heritage Council is presently preparing Resource, Protection, Planning Process (RP3) documents for the Kentucky and Licking drainages of eastern Kentucky. Once completed, these documents should provide additional guidance regarding significance statements for BLM's cultural properties located on FMO lands in those areas.

D. TREATMENT STRATEGIES

King (n.d.:16) lists five options readily available to management agency officials with regard to archeological and historic properties that may be affected by a federal undertaking. These include:

1. retention of the property in-place, and unchanged;
2. adaptive reuse and rehabilitation of the property in place;
3. relocation of the property;
4. recordation and data recovery; and
5. destruction without recordation or data recovery.

These treatment strategies are based on two underlying assumptions. The first is that there exists a specific federal undertaking that has the potential to adversely effect an archeological or historic resource. The second assumption is that the threatened property has been determined eligible for inclusion in the National Register of Historic Places.

To our knowledge, there are no immediate plans to lease specific tracts of federal minerals for exploration and

development in eastern Kentucky. Moreover, only one (15WO26) of the 446 recorded properties located on FMO lands has been determined eligible for inclusion in the National Register.

Appropriate treatment of the known FMO sites at this time focuses upon National Register evaluations. Because a portion of the known sites have already been evaluated and found not to meet the National Register criteria, the task is not as monumental as it would at first appear. Those sites located on FMO lands which have been found not significant and for which the field archeologists have recommended "no further work" are presented in Table 9. BLM should consult with the Kentucky State Historic Preservation Officer to obtain her concurrence that the sites listed in Table 9 do not meet the National Register criteria. If such concurrence is obtained, BLM has fulfilled its responsibility for these specific sites and no further consideration of them is required.

A second group of sites located on FMO lands have been identified as potentially eligible for inclusion in the National Register, but sub-surface testing is required before evaluation can be justified. Each of the sites listed in Table 10 have been recommended for further testing but these recommendations have not been implemented. It is recommended here that each of these sites be evaluated, but on a priority basis.

The highest priority for testing should be given to any of these sites which are located on tracts of land scheduled for mineral leasing. BLM should also consider a phased approach to sub-surface testing of these sites that allows an as-yet to be determined number of sites to be evaluated on an annual basis. It may be prudent, for example, to initiate site evaluations first in Berea, London, Somerset and Stearns Ranger Districts, of the Daniel Boone National Forest, based upon coal inventory assessments. Not only is the coal of good quality in these areas, but the potential for coal that can effectively be deep-mined is quite high in these areas (Richard Brook, personal communication, 1982). Sites that may potentially be affected by mining in these areas are those listed in Jackson, Rockcastle, Pulaski, Laurel, Whitley, and McCreary counties.

Conversely, the potential for coal in the northern half of Daniel Boone National Forest is low. Although site evaluations are required by Section 110 of the National Historic Preservation Act of 1966, as amended, the priority for testing sites located in Morehead and Stanton Ranger Districts, of the Daniel Boone National Forest (Lee, Estill, Wolfe, Powell, Menifee, Morgan, Bath, and Rowan counties) would necessarily be lower than those FMO sites located in the southern portion of the study area. Finally, the

Table 9. FMO Sites Recommended for "No Further Work."

Bath County				
	BH16	BH23	BH30	BH38
	BH18	BH24	BH31	BH39
	BH19	BH25	BH32	BH130
	BH20	BH26	BH34	
	BH21	BH27	BH35	
	BH22	BH28	BH37	
Clay County				
	CY22			
Estill County				
	ES21	ES22		
Jackson County				
	JA26	JA38	JA53	
	JA28	JA39		
Laurel County				
	L138	L174	L179	
	L173	L175		
Lawrence County				
	LL2	LL19	LL37	LL42
Leslie County				
	LS8	LS9	LS10	LS16
Menifee County				
	MF21	MF53	MF107	MF164
	MF22	MF55	MF108	MF165
	MF23	MF69	MF114	MF166
	MF25	MF79	MF115	MF174
	MF33	MF80	MF116	MF175
	MF34	MF86	MF120	MF176
	MF35	MF87	MF121B & C	MF204
	MF42	MF88	MF140B	MF205
	MF43	MF93	MF153	MF206
	MF44	MF103	MF154	MF207
Morgan County				
	MO2			
McCreary County				
	MCY40	MCY55	MCY62	MCY200
	MCY41	MCY60	MCY67	MCY201
	MCY43	MCY61	MCY71	MCY203
Pike County				
	PI11			

Powell County

PO52	PO59	PO62	PO65
PO53	PO60	PO63	PO66
PO54	PO61	PO64	

Rockcastle County

RK19	RK21	RK24	RK43
RK20	RK22	RK26	

Rowan County

RO1	RO11	RO19	RO50
RO2	RO14	RO20	RO51
RO3	RO15	RO37	RO52
RO6	RO16	RO46	RO54
RO7	RO17	RO47	RO55
RO9	RO18	RO49	RO56

Whitley County

WH21	WH33		
WH23			

Wolfe County

WO21	WO28	WO34	WO71
WO22	WO31	WO35	WO72
WO25	WO33	WO36	

Table 10. FMO Sites Recommended for Subsurface Testing.

Bath County			
BH33	BH44	BH128	BH137
BH36	BH127	BH129	
Clay County			
CY12	CY24	CY27	CY30
CY21	CY25	CY28	CY31
CY23	CY26	CY29	
Jackson County			
JA9			
JA52			
Lawrence County			
LA3	LA27	LA53	LA124
LA4	LA28	LA54	LA125
LA5	LA33	LA56	LA128
LA6	LA34	LA57	LA129
LA8	LA36	LA60	LA130
LA10	LA38	LA61	LA132
LA12	LA40	LA63	LA133
LA13	LA43	LA64	LA134
LA16	LA44	LA66	LA135
LA18	LA47	LA106	LA139
LA20	LA48	LA108	LA140
LA21	LA49	LA109	LA141
LA24	LA50	LA110	
LA25	LA51	LA115	
LA26	LA52	LA122	
Leslie County			
LS5	LS7	LS15	
LS6	LS11	LS18	
McCreary County			
MCY53	MCY56	MCY58	MCY65
MCY54	MCY57	MCY59	MCY70

Menifee County

MF10	MF76	MF104	MF145
MF27	MF77	MF105	MF146
MF32	MF78	MF109	MF147
MF39	MF81	MF110	MF148
MF41	MF82	MF111	MF149
MF54	MF83	MF112	MF151
MF56	MF84	MF117	MF152
MF57	MF85	MF121	MF153
MF58	MF90	MF123	MF156
MF59	MF91	MF136	MF161
MF60	MF92	MF137	MF168
MF61	MF94	MF138	MF173
MF62	MF95	MF139	MF177
MF63	MF97	MF140A	MF178
MF73	MF98	MF141	MF198
MF74	MF99	MF143	MF199
MF75	MF102	MF144	MF203

Morgan County

MO1

Powell County

PO111
PO112
PO113

Rockcastle

RK23	RK32	RK36	RK40
RK29	RK33	RK37	RK41
RK30	RK34	RK38	
RK31	RK35	RK39	

Rowan

RO10	RO57
RO48	RO58
RO53	

Whitley

WH22
WH34

Wolfe

WO23

Redbird Purchase Unit contains coal of good quality, but the mineral resources are not particularly well-suited for deep mining. Sites located on FMO lands in Owsley, Clay, Leslie, and Harlan Counties should probably receive the lowest priority in the proposed incremental testing program.

An alternative approach to a phased approach of individual site testing focuses upon selective testing of a few representative site types in areas where sites tend to cluster. Given an adequate amount of data to support National Register District nominations, a group of sites could be included in one or more districts, but each site would not necessarily require subsurface testing. At the present time, there is insufficient data to determine what would constitute a representative sample of the total universe of sites located in the study area, but district nominations would provide the vehicle by which such samples could be preserved and protected. BLM may wish to explore this option by consulting the maps submitted with this report.

Coal is not the only mineral resource which may be commercially developed on FMO lands. The BLM should be aware that there has been considerable interest in oil shale in the State of Kentucky in recent years. The shale bearing deposits in eastern Kentucky are primarily found in the Knobs Region which surround the Bluegrass Section of the Commonwealth. The counties containing FMO lands which are most likely to be affected by oil shale development are Rowan, Bath, and Menifee.

Oil and gas exploration and development represents another mineral resource held in federal mineral ownership. Exploration for this resource is widespread throughout Daniel Boone National Forest.

Six archeological sites located on FMO lands have been excavated. Sites 15MF10, 15WO1, and 15WO2 present some peculiar management problems. Each of these sites was excavated in the first half of this century. The excavation results for the two Wolfe County sites have been published by Funkhouser and Webb (1930). The Hooten Hollow Site (15MF10) was excavated by William G. Haag in 1942, but the field notes were lost, and no report of this investigation has ever been published. In all three instances it is not possible to determine how much, if any, of the cultural deposits may remain at these sites. All three sites appear to be very important sites, and there may be enough data to justify positive National Register evaluations without additional testing. Nevertheless, BLM is advised to relocate these sites in an effort to evaluate the integrity of the remaining cultural deposits.

The remaining three sites that have been excavated were each associated with reservoir projects. Archeological sites 15BH24 and 15BH37 were excavated to mitigate the impact of inundation from Cave Run Reservoir and similarly, 15PI11 was excavated in advance of flooding by Fishtrap Reservoir. All three sites are now under water, and no further consideration of them is required.

The balance of sites located on FMO lands have been identified in the course of various survey investigations and have not been evaluated. These inventory sites require National Register evaluation, but the pertinent survey reports do not include recommendations for appropriate treatment, or any clues as to the research potential these sites might possess. If any of these are threatened by mineral leasing activities, they should be evaluated and appropriate mitigation strategies should be developed in consultation with the Kentucky State Historic Preservation Officer.

E. RECOMMENDATIONS FOR PLANNING, IMPLEMENTATION, AND MONITORING

As previously noted, the study of eastern Kentucky archeology, despite its rather long history of investigation, has generated little more than highly biased inventory data that has been compiled from cursory surveys and the pioneering research of only a few scholars. The data, contained largely in unpublished reports, theses, dissertations, and published reports with only limited distributions, are very particularistic and descriptive. These documents generally contain only a minimum of comparative data and even less information of a synthetic nature.

The data are extremely biased towards open sites found in the floodpools of various reservoir projects and rockshelters located along the bases of bluff lines. Little information is available on site types and their distributions in the upland portions of the project area. Because most of the data have been accumulated from surveys, not excavations, there is a general and widespread lack of temporal control as evidenced by the large number of sites that can only be designated as "general prehistoric." Moreover, historic sites have only recently been reported in connection with survey investigations and these remain under-represented in the list of known sites. Survey data alone is inadequate for determining the number or nature of cultural components contained in any one site.

The management responsibility for these archeological and historic properties located on FMO lands, despite BLM's lead agency status, is not clear-cut. As previously stated in

Chapter I, the largest portion of federally owned minerals in Kentucky underlies surface property which is managed by the U.S.D.A. Forest Service, Daniel Boone National Forest. The U.S. Army Corps of Engineers also manages a minor portion of the surface property under consideration. This split authority can only hamper the development and implementation of an efficient management program for cultural properties located on FMO lands unless each agency is willing to cooperate and coordinate project planning as this relates to mineral development. It is recommended that BLM initiate consultations between each of these agencies, the Advisory Council on Historic Preservation, and the Kentucky State Historic Preservation Officer for the development of an interagency agreement regarding the treatment of cultural resources located in the study area.

The focus of such an agreement should center on the development of an historic preservation plan or program for the region. This program should minimally include six important aspects which will be discussed below.

1)An overview and research design that identify the types of archeological, architectural, historic, and cultural properties (cultural resources) that may be expected to occur on FMO lands should be prepared. The overview should also present research topics to be addressed, and establish survey or other appropriate strategies for the identification and evaluation of all cultural resources in the study area that may meet the criteria for inclusion in the National Register of Historic Places. The present study should be considered a foundation for this requirement.

2)The preservation program should establish an appropriate strategy for completing Class II (sample-oriented field inventory) and III (intensive field inventory) surveys. These may include both long-range planning surveys directed at developing the capacity to predict archaeological site location, and short-range inventory efforts for specific lease tracts or mine areas. This strategy should also include a schedule for completion of the survey as well as staffing and funding requirements.

3)The historic preservation program should establish procedures to be followed for determining whether or not specific cultural resources meet the National Register criteria, and for reviewing actions to determine the effects on National Register or eligible properties.

4)It should also include a procedure designed to avoid adverse impacts on cultural resources whenever possible. This may incorporate an assessment of alternatives to avoid such effects by project re-design, re-location, or mitigation where avoidance is not prudent and feasible. If

mitigation is required, the preservation program should include an established procedure for selecting an appropriate mitigation measure which includes consultation with interested parties.

5)The preservation program should ensure that reliable, comparable, and scientifically valuable information is collected and disseminated.

6)The preservation program should outline an appropriate organizational scheme which will ensure coordinated effort among the interested parties for the identification, evaluation, and preservation of cultural resources located in the study area.

Once the historic preservation plan has been developed, there must be a provision for periodic review and refinement of the plan. It is recommended that such review be regularly conducted by all interested parties at five-year intervals. The review should include not only an evaluation of the program's effectiveness, but should update the overview presented in this document and set forth any new research topics which should be investigated, as well as retire those topics which have been adequately addressed. The periodic review should also be used to formally refine and assess any models generated for the prediction of archeological site location that is subsequently developed.

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VIII. APPENDICES

APPENDIX A.

Selected Floral Species Found in Eastern Kentucky (adapted from Soils Systems, Inc. 1980)

Characteristic tree species of the upland forest in Kentucky:

(Quercus alba) white oak
(Q. velutina) black oak
(Q. macrocarpa) bur oak
(Q. falcata) southern red oak
(Q. stellata) post oak
(Q. muehlenbergii) chinquepin oak

(Carya glabra) pignut hickory
(C. tomentosa) mockernut hickory
(C. ovata) shagbark hickory
(Nyssa sylvatica) black gum

(Juniperus virginiana) Eastern red cedar
(Picea spp.) spruces

(Alnus glutinosa) European black alder
(Castanea mollissima) Chinese chestnut
(Elaeagnus angustiflolia) Russian olive
(Fraxinus spp.) ashes

(Fraxinus americana) white ash
(Acer saccharum) sugar maple
(Prunus serotina) cherry
(Tilia americana) basswood
(Fagus grandifolia) beech
(Liriodendron tulipifera) tulip tree
(Tsuga canadensis) hemlock
(Betula spp.) birch
(Acer rubrum) red maple
(Pinus virginiana) Virginia pine
(Juglans nigra) black walnut

(Liquidamber styraciflua) sweet gum
(Malus spp.) crabapples

(Platanus occidentalis) sycamore
(Robinia pseudoacacia) black locust
(Sassafras albidum) sassafras

Characteristic understory species of the upland forest in Kentucky:

(Cornus florida) dogwood

(Ilex opaca) holly
(Oxydendrum arboreum) sourwood
(Cercis canadensis) redbud

(Ostrya virginiana) ironwood

(Simlax spp.) greenbrier
(Magnolia grandiflora) magnolia

(Amelanchier spp.) service berry
(Asimina triloba) pawpaw
(Lindera benzoin) spicebush
(Hamamelis virginiana) witch hazel
(Euonymus americanus) strawberry bush
(E. atropurpurea) wahoo
(Kalmia latifolia) laurel

Herbs

(Agrostis alba) redtop

(Andropagon spp.) bluestems
(Avena sativa) oats
(Cynodon dactylon) bermuda grass

(Panicum clandestinum) deertongue
(P. milaceum) proso millet
(P. virgatum) switchgrass
(Pennisetum glaucum) pearl millet

(Dactylis glomerata) orchard grass
(Echinochloa spp.) Japanese millet
(Eragrostis curvula) weeping lovegrass
(Lolium spp.) ryegrass
(Sorgastrum nutans) Indiana grass
(Triticum aestivum) wheat
(Phalaris arundinacea) reed canary grass
(Phleum pratense) timothy
(Secale cereale) rye
(Setaria italica) foxtail millet
(Sorghum spp.) sorghums

Herbs (Leguminous Forbs)

(Cassis fasciculata) partridge pea
(Coronilla varia) crownvetch
(Glycine max) soybean
(Lathyrus sylvestris) flatpea
(Lespedeza cuneata) sericea lespedeza
(Lespedeza spp.) annual lespedeza
(Lotus corniculatus) birdsfoot trefoil
(Medicago sativa) alfalfa
(Melilotus spp.) sweet clover
(Trifolium spp.) clovers
(Vicia villosa) hairy vetch
(Vigna sinesis) cowpea

Herbs (Non-Leguminous Forbs)

(Fagopyrum spp.) buckwheat
(Helianthus annuus) sunflower

Shrubs

(Amorpha fruticosa) indigo bush
(Cornus spp.) dogwoods
(Cratasgus spp.) hawthorns
(Elaeagnus umbellata) autumn olive
(Lespedeza bicolor) bicolor lespedeza
(Lingustrum amurense) amur privet
(Myrica pennsylvanica) bayberry
(Lonicera japonica) Japanese honeysuckle
(Lonicera spp.) bush honeysuckle
(Rhus spp.) sumacs
(Robinia hispidus) bristly locus
(Rosa spp.) rose
(Symphoricarpos orbiculatus) coral berry
(Viburnum spp.) cranberry bush, arrowood

Grasses

(Andropogon gerardi) big bluestem
(Bromus, spp.) brome grass

(Panicum virgatun) switchgrass

(Sorghastrum nutans) Indian grass

(Beckmannia syzigachne) slough grass

(Poa, spp.) broomsedge

(Phalaris arundinacea) reed canary grass

(Dactylis glomerata) orchard grass

(Agrostis alba) redtop

(Panicum clandestinum) deer tongue

Invasion Species

(Juniperus virginiana) cedar

(Symphoricarpos orbiculata) coral berry

(Rhus, spp.) sumac

(Conzya canadensis) horseweed

(Campsis radicans) trumpet vine

(Lonicera japonica) honeysuckle

APPENDIX B.

Selected Faunal Species Found in Eastern Kentucky
(adapted from Soils Systems, Inc. 1980)

ORDER MARSUPIALIA: Marsupials

Family Didelphidae - New World Opossums	
Didelphis v. virginiana	Virginia Opossum

ORDER INSECTIVORA: Insectivores

Family Soricidae - Shrews	
Sorex f. fumeus	Smoky Shrew
Blarina brevicauda kirtlandi	Short-tailed Shrew
Cryptotis p. parva	Least Shrew
Family Talpidae - Moles	
Parascalops breweri	Hairy-tailed Mole
Scalopus aquaticus machrinus	Eastern Mole

ORDER CHIROPTERA: Bats

Family Vespertilionidae - Verspertilionid Bats	
Myotis l. lucifugus	Little Brown Bat
M. leibii leibii	Small-footed Myotis
M. gtisescens	Grey Bat
M. Keenii septentrionalis	Keen's Bat
M. sodalis	Indiana Bat
Lasionycteris noctivagans	Silver-haired Bat
Pipistrellus s. subflavus	Eastern Pipistrelle
Eptesicus f. fuscus	Big Brown Bat
Lasiurus b. borealis	Red Bat
L. c. cinereus	Hoary Bat
Nycticeius h. humeralis	Evening Bat
Plecotus rafinesquii	Eastern Big-eared Bat

ORDER LAGOMORPHA: Rabbits

Family Leporidae - Rabbits	
Sylvilagus floridanus mearnsii	Cottontail Rabbit

ORDER RODENTIA: Rodents

Family Sciuridae - Squirrels and Relatives	
Tamias s. striatus	Eastern Chipmunk
Marmota m. monax	Woodchuck

Sciurus c. carolinensis	Gray Squirrel
S. niger rufiventer	Fox Squirrel
Glaucomys v. volans	Southern Flying Squirrel
Family Castoridae - Beavers	
Castor canadensis carolinensis	American Beaver
Family Cricetidae - New World Rats and Mice	
Reithrodontomys h. humulis	Eastern Harvest Mouse
Peromyscus leucopus novaboracensis	White-footed Mouse
Ochrotomys nuttalli aureolus	Golden Mouse
Neotoma floridana magister	Cave Rat
Microtus pinetorum carbonarius	Woodland Vole
M. ochrogaster ohionensis	Prairie Vole
Ondatra z. zibethicus	Muskrat
Family Muridae - Old World Rats and Mice	
Rattus norvegicus	Norway Rat
Mus musculus	House Mouse

ORDER CARNIVORA: Carnivores

Family Canidae - Wolves, Coyotes, and Foxes	
Vulpes vulpes fulva	Red Fox
Urocyon c. cinereoargenteus	Eastern Grey Fox
Family Procyonidae - Raccoons	
Procyon l. lotor	Raccoon
Family Mustelidae - Minks, Weasels, Otters, and Skunks	
Mustela frenata noveboracensis	Long-tailed Weasel
M. vison mink	Mink
Spilogale p. putorius	Eastern Spotted Skunk
Mephitis mephitis nigra	Striped Skunk
Lontra c. canadensis	River Otter
Family Felidae - Cats	
Lynx r. rufus	Bobcat

ORDER ARTIDODACTILA: Even-toed Ungulates

Family Cervidae - Deer	
Odocoileus v. virginianus	White-tailed Deer

APPENDIX C.

Location of Collections from FMO Sites in Eastern Kentucky

This appendix is intended to assist those researchers who are interested in the artifact collections and attendant data generated from previous investigations of sites located on FMO lands. In certain instances, multiple investigations of the same site may have occurred, and the artifacts from each study may or may not have been curated at the same institution. If collections have been split, this is noted by duplication of site numbers on two or more lists.

The following list of sites, broken down by county, represents those sites located on federal mineral ownership lands in eastern Kentucky for which there are corresponding collections presently being curated at the Museum of Anthropology, University of Kentucky.

Bath County

15BH16	15BH24a	15BH33	15BH42
15BH18	15BH25	15BH34	15BH44
15BH19	15BH26	15BH35	15BH127
15BH20	15BH27	15BH36	15BH128
15BH21	15BH28	15BH37	15BH129
15BH22	15BH30	15BH38	15BH130
15BH23	15BH31	15BH39	
15BH24	15BH32	15BH41	

Clay County

15CY21	15CY28

Estill County

15ES21	15ES22

Jackson County

15JA26	15JA38	15JA52
15JA28	15JA39	15JA53

Laurel County

15LL32	15LL50	15LL60	15LL74
15LL33	15LL52	15LL61	15LL75
15LL38	15LL56	15LL62	15LL79
15LL39	15LL57	15LL63	15LL80
15LL40	15LL58	15LL70	
15LL48	15LL59	15LL73	

Lawrence County

15LA2	15LA16	15LA33	15LA50
15LA3	15LA17	15LA36	15LA51
15LA4	15LA18	15LA37	15LA52
15LA5	15LA19	15LA38	15LA53
15LA6	15LA20	15LA40	15LA54
15LA8	15LA21	15LA42	15LA57
15LA9	15LA24	15LA43	15LA58
15LA10	15LA25	15LA44	15LA60
15LA11	15LA26	15LA45	15LA61

15LA12	15LA27	15LA46	15LA63
15LA13	15LA28	15LA47	15LA64
15LA14	15LA31	15LA48	15LA66
15LA15	15LA32	15LA49	15LA67

Lee County

15LE5	15LE9	15LE11	

Leslie County

15LS6	15LS9	15LS15	
15LS7	15LS10	15LS16	
15LS8	15LS11	15LS18	

Menifee County

15MF10	15MF33	15MF44	15MF177
15MF21	15MF34	15MF53	15MF178
15MF22	15MF35	15MF54	15MF203
15MF23	15MF39	15MF55	15MF207
15MF25	15MF41	15MF173	
15MF27	15MF42	15MF174	
15MF32	15MF43	15MF175	

McCreary County

15McY40	15McY56	15McY62	15McY95
15McY41	15McY57	15McY65	15McY200
15McY43	15McY58	15McY67	15McY201
15McY53	15McY59	15McY70	15McY203
15McY54	15McY60	15McY71	
15McY55	15McY61	15McY94	

Morgan County

15MO1	15MO2		

Pike County

15PI7	15PI15	15PI25	15PI31
15PI8	15PI16	15PI26	15PI32
15PI11	15PI18	15PI27	15PI34
15PI12	15PI20	15PI29	
15PI14	15PI21	15PI30	

Powell County

15PO52	15PO60	15PO64	15PO111
15PO53	15PO61	15PO65	15PO112
15PO54	15PO62	15PO66	15PO113
15PO59	15PO63	15PO109	

Pulaski County

15PU171			

Rockcastle County

15RK19	15RK29	15RK34	15RK39
15RK20	15RK30	15RK35	15RK40
15RK21	15RK31	15RK36	15RK41
15RK22	15RK32	15RK37	15RK43

15RK23	15RK33	15RK38	

Rowan County

15RO1	15RO10	15RO19	15RO28
15RO2	15RO11	15RO20	15RO29
15RO3	15RO14	15RO22	15RO30
15RO6	15RO15	15RO23	15RO31
15RO7	15RO16	15RO25	15RO32
15RO8	15RO17	15RO26	15RO37
15RO9	15RO18	15RO27	15RO38

Whitley County

15WH21	15WH23	15WH33	15WH34

Wolfe County

15WO1	15WO23	15WO33	15WO72
15WO2	15WO25	15WO34	
15WO21	15WO28	15WO35	
15WO22	15WO31	15WO71	

The following list of sites, broken down by county, represents those sites located on federal mineral ownership lands in eastern Kentucky for which there are corresponding collections presently being curated by the U.S.D.A. Forest Service, Daniel Boone National Forest.

Leslie County

15LS5

Menifee County

15MF56	15MF87	15MF117	15MF164
15MF57	15MF90	15MF120	15MF165
15MF58	15MF91	15MF121	15MF166
15MF59	15MF92	15MF123	15MF168
15MF60	15MF93	15MF136	15MF176
15MF61	15MF94	15MF137	15MF179
15MF62	15MF95	15MF138	15MF180
15MF63	15MF97	15MF139	15MF181
15MF69	15MF98	15MF140A & B	15MF183
15MF73	15MF99	15MF141	15MF184
15MF74	15MF102	15MF143	15MF186
15MF75	15MF103	15MF144	15MF189
15MF76	15MF104	15MF145	15MF190
15MF77	15MF105	15MF146	15MF191
15MF78	15MF107	15MF147	15MF193
15MF79	15MF108	15MF148	15MF194
15MF80	15MF109	15MF149A & B	15MF196
15MF81	15MF110	15MF151	15MF197
15MF82	15MF111	15MF152	15MF198
15MF83	15MF112	15MF153	15MF199
15MF84	15MF114	15MF154	15MF204
15MF85	15MF115	15MF156	15MF205
15MF86	15MF116	15MF161	15MF206

Powell County

15PO52	15PO53	15PO54	

Rockcastle County

15RK20	15RK22	15RK26	
15RK21	15RK24	15RK43	

Rowan County

15RO46	15RO49	15RO53	15RO56
15RO47	15RO50	15RO54	15RO57
15RO48	15RO51	15RO55	15RO58

The following list of sites, broken down by county, represents those sites located on federal mineral ownership lands in eastern Kentucky for which there are no collections.

Bath County

15BH137			

Clay County

15CY12	15CY24	15CY27	15CY31
15CY22	15CY25	15CY29	
15CY23	15CY26	15CY30	

Jackson County

15JA9			

Laurel County

15LL4	15LL66	15LL67	15LL69

Lawrence County

15LA34	15LA56		

McCreary County

15McY3			

Pike County

15PI24	15PI37	15PI40	
15PI33	15PI38		

Rockcastle County

15RK26			

Rowan County

15RO47	15RO49	15RO52	
15RO48	15RO50		

Whitely County

15WH20	15WH22		

The following list of sites, broken down by county, represents those sites located on federal mineral ownership lands in eastern Kentucky for which collections are owned by amateur archeologists.

Lawrence County

15LA105	15LA115	15LA129	15LA135
15LA106	15LA122	15LA130	15LA139
15LA108	15LA124	15LA132	15LA140
15LA109	15LA125	15LA133	15LA141
15LA110	15LA128	15LA134	

Leslie County

15LS4

The following list of sites, broken down by county, represents those sites located on federal mineral ownership lands in eastern Kentucky for which there are corresponding collections presently being curated by Western Kentucky State University, Bowling Green.

Laurel County

15LL300	15LL302

Whitley County

15WH302	15WH305	15WH308
15WH303	15WH306	15WH310
15WH304	15WH307	15WH312

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