SUSITNA
HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION
PROJECT No. 7114

RESPONSE TO FEDERAL ENERGY REGULATORY COMMISSION DATA REQUEST OF MARCH 15, 1985

HARZA-EBASCO
SUSITNA JOINT VENTURE

APRIL 3, 1985
DOCUMENT No. 2694

ALASKA POWER AUTHORITY

ALASKA POWER AUTHORITY

334 WEST 5th AVENUE - ANCHORAGE, ALASKA 99501

Phone: (907) 277-7641
(907) 276-0001

April 3, 1985
Susitna File No. 1.8.1/6.2.2.2

Pillsbury, Madison & Sutro
1667 K Street
Suite 1100
Washington, D.C. 20006

Attention: D. Jane Drennan, Esq.

Subject: Susitna Hydroelectric Project
FERC Request of March 15, 1985

Dear Ms. Drennan:

Enclosed for transmittal to FERC is information in response to the subject request. Nine copies are enclosed for filing with FERC and your files.

Sincerely,

James B. Dischinger
Project Manager
Susitna Hydroelectric Project

sdw

Enc: as noted

cc w/ Enc:
C. Curtis, VFSC&L
J. Lowenfels, BHBP&A
w/o Enc:
W. Larson, HE
C. Craddock, HE
J. Thrall, HE
J. Robinson, HE

610971/4

4-4
R2M

Item 1

Provide any updated information, since the filing of the application, on the order in which the proposed project's borrow areas would be developed and on the acreages of vegetation and wetlands that would be affected. If no changes have occurred since the filing of the application, please provide the acreages of vegetation and wetlands that would be affected by use of borrow areas B, C, J and L.

Response

Since the filing of the license application, the engineering effort has been limited to certain design refinements and responding to FERC information requests. As a consequence, no additional investigations have been carried out in the borrow and quarry sites. The quantities of the various materials to be utilized has changed and is reflected in the design refinements (revised Exhibit F, filed with FERC August 14, 1984).

In the revised Feasibility Cost Estimate, which was filed with FERC on August 15, 1984, the cost estimate was based on obtaining materials for the Watana embankment and concrete from the following primary borrow and quarry sites:

Quarry A - rockfill
Borrow D - impervious fill
Borrow E - sand and gravel fill and aggregate

Additional sand and gravel fill and rockfill would be obtained from the required excavations. Secondary sources for meeting the quantity of material required could be obtained from the following borrow and quarry sites:

Quarry B - rockfill
Borrow C, F, I, J - sand and gravel fill and aggregate

Borrow H - impervious

Quarry L - rockfill

Table 1 provides the acreages of each vegetation type that occurs within the maximum boundaries of borrow areas J and C and quarry sites B and L. For sites B, J and L these acreages were measured from 1:24,000 scale vegetation mapping of the project area. The acreages for site C were measured from 1:63,360 scale mapping for the most part. A portion of the northern half of borrow site C was calculated from 1:250,000 scale mapping.

Tables 2 and 3 provide the acreages of wetlands that occur within the maximum boundaries of the borrow and quarry sites. Table 2 presents acreages grouped into general wetland categories such as riverine, palustrine forested, etc. Table 3 gives acreages of specific wetland types. Table 4 gives detailed descriptions of specific wetland types and is meant to be a key to wetland codes presented in Table 3. For sites B, J and L acreages were measured from 1:63,360 scale air photo overlays prepared by the USFWS as part of the National Wetlands Inventory. These overlays were the same ones used to calculate wetland acreages provided for project components in the wetlands information provided to FERC on November 21, 1984. We refer you to that submittal for more background.

Wetland mapping prepared by USFWS is not available for areas encompassed by borrow site C at the time of this submittal.[1/] Acreages of wetlands within the maximum boundaries of site C (as presented in Table 2, herein) were converted from vegetation acreages using information contained in table E.81 of the license application. These conversions yielded only general wetland categories, therefore no specific wetland types are included for site C. It should be noted that quarry sites B and L and borrow site J will be completely inundated by the project. Vegetation and wetland acreage figures for these sites have already been submitted with impoundment figures.

1/ It is presently anticipated that this material will be available by late April, 1984.

TABLE 1

SUSITNA HYDROELECTRIC PROJECT
ACRES OF VEGETATION WITHIN SELECTED BORROW SITES

Site B (acres)	
Open Mixed Forest	21.5
Closed Birch Forest	14.3
Closed Mixed Forest	46.0

Site C (acres)	
Birch Shrub	50.0
Willow Shrub	780.0
Low Shrub	390.0
Open Tall Shrub	362.0
Closed Tall Shrub	20.0
Woodland White Spruce	290.00

Borrowsite J (acres)	
Open White Spruce	67.4
Woodland Black Spruce	4.3
Closed Birch Forest	4.3
Willow Shrub	8.6
Closed Mixed Forest	43.0
Closed Balsam Poplar	2.9
Open Black Spruce	8.6
Open Mixed Forest	1.4
Open Tall Shrub	10.0
Wet Sedge Grass	5.7

Site L (acres)	
Open Tall Shrub	14.3
Woodland Black Spruce	14.3

610682
850404

TABLE 2

SUSITNA HYDROELECTRIC PROJECT
ACRES OF GENERAL WETLAND CATEGORIES WITHIN
SELECTED BORROW SITES

	Borrow Areas (acres)			
	B	C	J	L
Palustrine Forested	0	0	15.4	1.4
Palustrine Scrub/Shrub	0	1220.0	23.4	0
Palustrine Emergent	0	0	5.0	0
Riverine	0	30.0	961.4	0

TABLE 3

SUSITNA HYDROELECTRIC PROJECT
ACRES OF SPECIFIC WETLAND
TYPES IMPACTED BY THE PROPOSED PROJECT[1/]

Site B
No wetlands

Site J
(acres)

PSS1A	13.0
R3US C	23.0
PSS1/USA	10.4
R30WH	876.3
PF04B	3.2
PEM1/SS1C	5.0
R3USA	62.1
PF05C	3.6
PF04/EM1B	6.1
PF01/SS1A	2.5

Site L
(acres)

PF04B	1.4

1/See Table 4 for explanation of wetland codes

TABLE 4

SUSITNA HYDROELECTRIC PROJECT
KEY TO THE WETLAND TYPES
IMPACTED BY THE PROPOSED SUSITNA HYDROELECTRIC PROJECT

The following wetland types are found in the proposed Susitna Hydroelectric Project development sites. The codes preceding the wetland type descriptions are the map codes that are used by the U.S. Fish and Wildlife Service's National Wetland Inventory program. The wetland classification is based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979)a/.

Palustrine Ponds

POWH — Permanently flooded, small open water bodies (ponds). Vegetation is generally lacking within the open water area, but aquatic beds or emergents may provide sparse cover less than 30% along the pond edge.

POW/AB3H — Permanently flooded ponds supporting aquatic (floating-leaved) vegetation. Dominant plants include yellow pond lily (Nuphar polysepalim) and pondweed (Potamogeton sp.).

Lacustrine

L1OWH — Permanently flooded, open water areas greater than 20 ac in size. The water depth usually exceeds 2 m.

Riverine (Rivers and Streams)

R3OWH — Permanently flooded, open water channels of upper perennial rivers and streams.

a/ Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. USDI, Fish and Wildlife Service FWS/OBS-79/31. Washington, D.C. 103 pp.

R3USC — Seasonally flooded river flats and bars within upper perennial river channels.

R3USA — Temporarily flooded river flats and bars within upper perennial river channels.

Palustrine forested

PF04B — Saturated black spruce (*Picea mariana*) forested wetlands. These areas are characterized by a closed canopy of black spruce.

PF04/SS1B — Saturated, open canopy black spruce forested wetlands with an understory of broad-leaved deciduous shrubs. The areal coverage of the black spruce is between 30% and 50%.

PF04/SS4B — Saturated, open canopy black spruce forested wetland with an understory of scrub black spruce.

PF04/SS1A — Temporarily flooded wetlands adjacent to streams and rivers that are a complex of black spruce on higher terraces, and deciduous shrubs on lower terraces. Willow (*Salix* spp.) and alder (*Alnus* spp.) are the common shrub species.

PF04/EM1B — Saturated, open canopy black spruce forested wetlands with an emergent understory.

PF04/1B — Saturated, closed canopy forested wetlands consisting of a mix of broad-leaved deciduous and needle-leaved evergreen trees. Black cottonwood (*Populus trichocarpa*) and balsam poplar (*Populus balsamifera*) are the dominant deciduous species. Black spruce is the dominant evergreen species.

PF01A — Temporarily flooded deciduous forest wetlands occurring on river floodplains. Balsam poplar and black cottonwood are the common trees on these sites.

PF01/SS1A — Temporarily flooded wetlands on river and stream floodplains consisting of a mix of broad-leaved deciduous forest and broad-leaved deciduous shrubs. Dominant tree species are balsam poplar and black cottonwood. Willow and alder are the dominant species in the shrub areas.

PF05C — Seasonally flooded dead tree forested wetlands generally found along streams and small rivers. The dead condition of the trees is usually a result of beaver activity.

Palustrine Scrub/Shrub

PSS1A — Temporarily flooded dense shrub areas on river and stream floodplains consisting primarily of willow and alder. This wetland type often occurs on riverbars that have become stable enough to support persistent woody vegetation.

PSS1/USA — Temporarily flooded areas on river and stream floodplains consisting of a mix of shrubs and non-vegetated riverine flats. Shrub species are primarily willow and alder.

PSS1B — Saturated, dense shrub wetlands usually occurring in seepage areas on slopes. Tall willow and alder are the most common species.

PSS1/EM1B — Saturated bogs and moist tundra areas on poorly drained soil with 30% or more of the canopy consisting of low broad-leaved deciduous shrubs. The remaining portion of the canopy consists of persistent emergent vegetation. Common shrub species include dwarf birch (Betula nana), resin birch (Betula glandulosa), willows, bog blueberry (Vaccinium uliginosum), labrador tea (Ledum groenlandicum), crowberry (Empetrum nigrum), bog rosemary (Andromeda polifolia) and bearberry (Arctostaphylos spp.)

Dominant emergent species include cottongrass (Eriophorum spp.), sedges (Carex spp.), and bluejoint (Calamagrostis canadensis).

PSS1/EM1C — Seasonally flooded areas occurring on floodplains in stream and creek corridors. These wetlands are characterized by a mixture of broad-leaved deciduous shrubs and emergent vegetation. Common shrubs include tall willow and alder. Emergent species of primary importance include sedges, cottongrass, bluejoint, and horsetail (Equisetum spp.).

PSS1/EM1F — Patterned bogs (string bogs and reticulate bogs), and other semipermanently flooded complexes of emergents and broad-leaved deciduous shrubs. This wetland type is sometimes found in areas influenced by beaver activity. In patterned bog areas the shrub species include those described for PSS1/EM1B wetlands. Dominant emergent species include sedges, horsetails, marsh cinquefoil (Potuntilla palistris), buckbean (Menyanthes trifoliata, and rushes (Juncus spp.).

PSS4B — Saturated closed canopy black spruce scrub wetlands. The black spruce in these areas is less than 6 m. in height.

PSS4/EM1B — Saturated, open canopy black spruce scrub wetlands with an emergent understory.

PSS4/1B — Saturated, open canopy black spruce scrub wetlands with a dense deciduous shrub understory. The deciduous shrub species include dwarf birch, labrador tea, bog blueberry, and willows.

Palustrine Wetlands

PEM1B — Saturated, emergent, bog-type wetlands in depressions below the tree line, and high elevation sedge-grass tundra areas on

poorly drained soils. Common emergent species include cottongrass, sedges, and bluejoint.

PEM1C — Seasonally flooded emergent marshes occurring in the floodplain of small streams and on the periphery of ponds and lakes. Surface water is present in these areas for 1-2 months during the growing season. Species of primary importance include sedges, cottongrass, bluejoint, and horsetails.

PEM1F — Semipermanently flooded emergent marshes. These marsh areas usually exhibit standing water throughout the growing season in most years. This wetland type usually occurs in wetter portions of typical emergent and shrub bog situations, and along the periphery of ponds and lakes. Dominant vegetation includes water sedge (Carex aquatilis), marsh horsetail (Equisetum palustre), buckbean, marsh cinquefoil, and rushes.

PEM1H — Permanently flooded, emergent marshes. These areas exhibit standing water throughout the year in all years. The dominant vegetation consists of water sedge, horsetails, and buckbean.

PEM1/SS1C — Seasonally flooded areas occurring on floodplains in stream and creek corridors, characterized by a mixture of emergent vegetation and broad-leaved deciduous shrubs with the former covering more than 50 percent of the area.

Item 2

If the Applicant has mapped the vegetation of the Healy-Willow transmission line segment according to the Vierick-Dyrness classification scheme, provide quantification of vegetation types and wetland types that would be crossed by the right-of-way.

Response

Other than the vegetation mapping summarized in Table E.3.79 of the License Application no new vegetation mapping of the Healy-Willow transmission line segment has been done, and there are no plans to do this in the future.

Item 3

Provide a copy of the report entitled "Site Significance: A Framework for Evaluating Cultural Resources Associated with the Susitna Hydroelectric Project in Central Interior Alaska" [May 1984].

Response

The Draft May 1984 report entitled "Site Significance; A Framework for Evaluating Cultural Resources Associated with the Susitna Hydroelectric Project in Central Interior Alaska" is attached.

SUSITNA HYDROELECTRIC PROJECT

DRAFT

SITE SIGNIFICANCE: A FRAMEWORK FOR EVALUATING CULTURAL RESOURCES ASSOCIATED WITH THE SUSITNA HYDROELECTRIC PROJECT IN CENTRAL INTERIOR ALASKA

Report by
University of Alaska Museum
Archeology Department

Prepared for
Alaska Power Authority

Draft Report
May 1984

DRAFT

1 - INTRODUCTION

1.1 - Scope

Federal agencies are required to assess the effects of projects, such as the Susitna Hydroelectric Project, on properties on or eligible for nomination to the National Register of Historic Places. When such properties will be adversely affected, the agency must determine whether there are feasible and prudent alternatives which would avoid or satisfactorily mitigate the adverse effect. The eligibility of a site or group of sites, for inclusion in the National Register, is based on the significance of the site(s). Therefore, it is first necessary to determine site significance. The significance of a site is directly related to its potential to answer research questions. This report summarizes the assessment of site significance through defining the concept of significance, identifying pertinent variables, and presenting research questions relevant to the study area.

Section 2 addresses the determination of site significance from legal and scientific perspectives. Legislation relating to site significance is discussed and professional concerns on the definition of significance are presented.

Section 3 presents the variables recorded for each site. These data form the basis for determining the relevance of a site to a particular research topic. The method of recording data and a explanation of the variables are presented in the Procedures/Quality Assurance Manual (Revised 1984).

Section 4 presents research questions grouped according to five major research areas. These areas are: 1) Cultural Chronology, 2) Possible Effects of Tephra Falls on Prehistoric Human Ecology, 3) Subsistence and Settlement, 4) Population Dynamics / Exchange and Diffusion, and 5) Ethnography and History. Additional research topics may be generated as a result of evaluating the questions and the collection of additional data through continuing fieldwork.

2 - SITE SIGNIFICANCE

The federal mandate to manage and protect archeological and historical resources has historically divided cultural properties into two classes: those which are "significant" and those which are not (Tainter and Lucas 1983:707). The definition of significant archeological resources is a controversial and much debated concept in archeological and legal communities. The complexity of the concept of significance has been discussed and evaluated in a number of reports and articles (Anderson 1972; Scovill et al. 1972; House and Schiffer 1975; Moratto 1975; Glassow 1977; King et al. 1977; Moratto and Kelly 1977; Raab and Klinger 1977; Schiffer and Gumerman 1977; Schiffer and House 1977; Sharrock and Grayson 1979; Barnes et al. 1980; Tainter and Lucas 1983). This section will outline the history of significance from legal and scientific standpoints to explicate how the concept of significance is implemented with respect for archeological sites associated with the Susitna Hydroelectric Project.

Effective evaluation of the concept of significance can be accomplished by dividing it into types.

> In principle, the process of assessing significance is relatively straightforward once there is agreement on the types of significance that needs to be considered. One first specifies explicit criteria for judging resources in relation to each type of significance. Then the fit between the criteria and the resources is evaluated. Finally, it may be desirable to arrive at an overall judgment based on a weighing of the types of significance that have been considered (Schiffer and Gumerman 1977:240).

Although several types of significance have been recognized in the literature, including historical, ethnic, public, legal, and scientific significance

(Schiffer & Gummerman 1977:244-245), two are considered most encompassing and integral to our discussion. As will be shown, legal and scientific concepts of significance provide two different but interrelated perspectives.

2.1 - Legal Significance

The concept of significance has a long history in federal legislation relating to archeological and historic preservation. In early legislation, such as the 1906 Antiquities Act and the 1935 Historic Sites Act, the concept was equated with significance on a national level. Private preservation groups working in the early decades of this century had to come to grips with the significance concept in order to evaluate historic buildings on their associative (association with great persons and events in American History) and artistic merits. This need to set standards for evaluation in historic preservation greatly influenced the further development of the concept of significance (Tainter and Lucas 1983:708).

The first formulation of guidelines to serve as selection standards for preservation was attempted by the National Park Service Chief Historian and later released to the National Resources Board in 1934. The determining factor for selection of a historic or prehistoric site was its possession of "certain matchless or unique qualities" which represented large patterns of "the American story," were associated with the life of some great American, or associated with some dramatic event in American history (Schneider 1935, in Tainter and Lucas 1983). Subsequent guidelines issued by a private organization, the National Council for Historic Preservation, which lobbied for the congressionally chartered National Trust for Historic Preservation,

were based primarily on the 1934 standards, but stated more explicitly that preservation was to include sites exemplifying the achievements of aboriginal man in America or sites of outstanding scientific importance for the light they shed on this subject (Finley 1965, in Tainter and Lucas 1983). These criteria were revised and expanded by the National Trust in 1956 and are the basis for the federal attempts to define significance today (Tainter and Lucas 1983:708).

As a result of two important pieces of legislation and a presidential mandate, standards by which to evaluate the significance of sites have again been codified by the federal government. The National Historic Preservation Act (NHPA) of 1966 established the National Register of "districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, and culture" (Public Law 89-665; 80 Stat. 915; 16 U.S.C. 470, Section 101). Under the provisions of this law, consideration must be given to any National Register or National Register eligible site, structure, or district which is to be adversely affected by projects utilizing federal funds. Also with the passage of NHPA, resources of regional, state, and local as well as national significance gained protection under the law.

The importance of the National Register was strengthened by the signing of Executive Order 11593 in 1971. This directive ordered federal agencies to locate, inventory, and nominate to the Secretary of the Interior all properties under their jurisdiction or control that appear to qualify for listing on the National Register of Historic Places (E.O. 11593). Implicit in the order is the notion that properties must be significant in order to be

nominated to the National Register, as pointed out by Tainter and Lucas (1983:709).

In 1974 another key piece of legislation dealing with significant properties, the Archeological and Historic Preservation Act, was passed. It amends the Reservoir Salvage Act of 1960 which provided for the preservation of historical and archeological data that might be lost as a result of dam construction (74 Stat. 220; 16 U.S.C. 469). According to an amended section of the 1974 law,

> Whenever any Federal agency finds, or is notified, in writing, by an appropriate historical or archeological authority, that its activities in connection with any Federal construction project of federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, such agency shall notify the Secretary (Secretary of the Interior), in writing, and shall provide the Secretary with appropriate information concerning the project, program or activity. (Public Law 93-291; Stat. 174)

The law further states that recovery, protection, and preservation of the data must subsequently take place.

Criteria by which to assess significance in compliance with the federal laws and Executive Order 11593 appear in the Federal Register in 1976 and have been worded to provide for the inclusion of a diversity of cultural resources on the National Register of Historic Places. According to the National Register criteria of evaluation, the quality of significance is present in historic and archeological properties that

possess integrity of location, design, setting, material, workmanship, feeling, and association, and

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

(b) That are associated with the lives of persons significant in our past; or

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

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

Criterion (d) is generally used in nominating archeological sites to the register.

Tainter and Lucas (1983) observed that the history of the concept of significance is rooted in legislation passed in the early decades of this century in response to concerns of architectural preservationists. The criteria stated above are very broad with regard to assessing the scientific or research value of archeological sites. Some aid in determining significance is, however, provided in a handbook, Treatment of Archeological Properties, published in 1980 by the Advisory Council on Historic Preservation. The council was established by the NHPA to act in an advisory capacity in reviewing proposals for archeological data recovery projects. In their handbook principles guiding the Council's staff in their review process are set forth. One of their major principles states that properties draw their archeological value (significance) from the "assumption that they can be used fruitfully for research" (Advisory Council on Historic Preservation 1980:6). One of the stated intents of the National Historic Preservation Act is "to insure future generations a genuine opportunity to appreciate and enjoy the rich heritage of our Nation" (Public Law 89-665, Preamble). Archeological research which addresses significant questions about the past is viewed by the council as being in the public interest, and thus fulfills this intent.

The crucial role of research potential in assessing archeological significance is also documented in the Federal Register among the regulations to be employed in complying with the Archeological and Historic Act of 1974.

> Significant....data, as used by the Act, are data that can be used to answer research questions, including questions of present importance to scholars and questions that may be posed in the future (36 CFR 66.1).

These additional guidelines, set within a scientific framework, allow archeologists to more effectively gauge whether or not a site or sites have "yielded, or may be likely to yield, information important in prehistory or history" (CFR 36 60.6).

2.2 - Scientific Significance

Scientific significance is an outgrowth of legal significance as stated in federal antiquities legislation over the past century and more specifically since 1976 when the Federal Register set forth criteria for significance pursuant to the Historic Site Preservation Act of 1966, National Environmental Policy Act of 1969 and Executive Order 11593. This legislation is very open ended and subject to a wide range of interpretations (Raab and Klinger 1977).

A general consensus in the archeological discipline has been reached in interpreting the legislation. House and Schiffer (1977) state that significance of archeological sites is best assessed by scientific significance. They further argue that scientific significance is best evaluated by research potential. This position is also supported by Raab and Klinger who "... feel that the best approach to assessing archaeological significance is in relation to explicit, problem-oriented research designs" (1977:632). This same position was subsequently adopted by other

archeologists (Grady 1977; Lynott 1980). The assessment of archeological significance in general and scientific significance in particular might best be taken from Schiffer and Gumerman:

> A site or resource is said to be scientifically significant when its further study may be expected to help answer current research questions. That is, scientific significance is defined as research potential (1977:241).

The nature of research potential with regard to scientific significance is both diversified and dynamic. Basic archeological issues such as regional classification and chronology are included along with broader theoretical goals such as general anthropological principles and social scientific methods. Dixon (1977) presents an argument which suggests a broadening of the archeological significance base to other areas of science such as paleoecology, marine mammals science, weather and climate, and the fishing industry. These are all within the realm of scientific significance.

One other outstanding characteristic of scientific significance is its dynamic nature. If scientific significance is tied closely with research potential, then as research designs change and methodological techniques develop, the status of significance will also change. Lynott (1980) illustrates this case with an example from central Texas. The initial assessment of Bear Creek Shelter after limited testing in 1947 was essentially negative. This assessment was based upon the site's research potential to contribute to chronology building. Upon reevaluation of the site in the 1970's, research had come to emphasize questions of subsistence and settlement and the site was consequently considered significant. This same kind of issue of "future potential" is recognized by other archeologists (Glassow 1977; Dixon, in press). For instance, Glassow suggests:

> ...the history of archaeology over the last two decades demonstrates that our conception of what is important to observe in the archaeological record is subject of radical change or at least significant expansion. Before the advent of concern for studying settlement patterns, for example, only "type sites" or sites with deep, large deposits might have been considered "significant", whereas today we would consider even small, ephemeral sites to be important (1977:414).

The same kind of issue can be found in the archeological literature outside of a management context. For instance, Dixon evaluates the significance of artifacts from sites along the Porcupine River, Alaska, based upon context.

> The question of context is of paramount importance because it provides all things with meaning. Context provides parameters in which any object or phenomena may be interpreted and through interpretation becomes knowledge. Context is not limited to the depositional setting and recorded data associated with a specimen. The historic period in which the investigator functions also provides context which limits the parameters of analysis. For example, archeological material discovered in the early 1900's is regarded differently in the 1980's because of the advancement in analytical techniques, such as scanning electron microscopy and radiometric dating, which have expanded the contextual limits of recovered material.
>
> Context must be understood as being characterized by a degree of confidence rather than as an absolute state of being. The degree of confidence is dependent upon the amount and quality of the information context provides (Dixon, in press).

Tainter and Lucas (1983:707-718) attempt to sum the problem up by suggesting that because the theoretical and methodological basis of research in archeology changes, as with all empirical disciplines, we must make our own assessments with very careful detail and rigor. In recapitulation, the significance of archeological resources is best assessed within a framework of research potential given the diversified and dynamic character of the science.

2.3 - Summary

Although the development of legal and scientific concepts of significance have been discussed separately, it is clear that the two are closely interrelated and cannot be separated in actual practice. The crucial element that defines significance is research potential. This is best measured by the ability of the site data to answer current research questions. The process of constructing a framework for assessing the potential of specific sites to answer significant research questions within the Susitna River Canyon area is a complex task which involves three major steps: 1) identifying the range of variables present at the sites, 2) formulating the research questions, and 3) matching sites having the appropriate variables to specific questions. A discussion of the first two is presented below. The third will be addressed after completion of reconnaissance level survey and systematic testing.

3 - VARIABLES

3.1 - Introduction

The procedures implemented during Cultural Resources Investigation associated with the Susitna Hydroelectric Project are designed to retrieve information on three major attributes of sites: location, stratigraphic context, and artifact assemblage. A host of variables by which sites can be evaluated for significance are subsumed under each category. These variables, ranging from geographic and environmental context of a site to raw materials used in the manufacture of artifacts found at a site, are discussed below.

3.2 - Locational Data

The site form completed for each site includes locational information relating to map coordinates, elevation, site size, terrain, vegetation, proximity to topographic features, and view. Map location is recorded by: 1) map quadrangle, e.g., Talkeetna Mountains; 2) the designation of the particular section of the quad, e.g., D-5; 3) the township, range, section, and quarter section description; 4) the UTM coordinates to the nearest 50 m; and 5) the latitude and longitude coordinates to within 5 seconds. The elevation of the site is recorded according to the position of the site on U.S.G.S. 1:63,360 series maps. Altimeter readings are also taken on direct impact sites within the proposed impoundments.

Two estimates of site size are recorded. The first is the observed size of the site as determined by surface artifacts and subsurface testing. The

testing procedure for determining site size is presented in the Procedures/Quality Assurance Manual (revised 1984). An estimated size of the site based upon the probable site limits as constrained by the terrain feature is also recorded. This latter value is important given the discontinuous nature of the artifact distribution at some sites, and the chance that testing may not reveal the limits of the entire site.

Additional information relevant to the location of the site is provided by the terrain unit and vegetation regime present at the site. Geological terrain units as defined by R & M Consultants for the Susitna Hydroelectric Project, are used. Descriptions of the vegetation regime at the site follow the designations on the vegetation maps prepared for the Susitna Hydroelectric Project by the Agricultural Experiment Station, University of Alaska, Palmer. Sites not appearing on the above maps are assessed following the definitions of the terrain or vegetation units.

3.3 - Stratigraphic Context

Sixteen stratigraphic units have been identified in the project area (Dixon et al. 1982a:5-19). No individual tests or sites have been found to contain all 16 stratigraphic units, however several archeological sites exhibit at least ten. Within any given site or site locus, subunits can be arranged in stratigraphic order. The stratigraphic units are composed of the surface organics and associated pedogenic units, four tephra units, glacial drift, bedrock, and the intervening contacts. By regarding the contact units as separate stratigraphic units, it is possible to accurately define the intervals between deposition of soil/sediment units. The four tephra units

testing procedure for determining site size is presented in the Procedures/Quality Assurance Manual (revised 1984). An estimated size of the site based upon the probable site limits as constrained by the terrain feature is also recorded. This latter value is important given the discontinuous nature of the artifact distribution at some sites, and the chance that testing may not reveal the limits of the entire site.

Additional information relevant to the location of the site is provided by the terrain unit and vegetation regime present at the site. Geological terrain units as defined by R & M Consultants for the Susitna Hydroelectric Project, are used. Descriptions of the vegetation regime at the site follow the designations on the vegetation maps prepared for the Susitna Hydroelectric Project by the Agricultural Experiment Station, University of Alaska, Palmer. Sites not appearing on the above maps are assessed following the definitions of the terrain or vegetation units.

3.3 - Stratigraphic Context

Sixteen stratigraphic units have been identified in the project area (Dixon et al. 1982a:5-19). No individual tests or sites have been found to contain all 16 stratigraphic units, however several archeological sites exhibit at least ten. Within any given site or site locus, subunits can be arranged in stratigraphic order. The stratigraphic units are composed of the surface organics and associated pedogenic units, four tephra units, glacial drift, bedrock, and the intervening contacts. By regarding the contact units as separate stratigraphic units, it is possible to accurately define the intervals between deposition of soil/sediment units. The four tephra units

are identified by local, project specific names. From the earliest to most recent they are: Oshetna, Lower Watana, Upper Watana, and Devil. The tephra units are identifiable in the field on the basis of color and texture. The region-wide occurrence of the tephra deposits make them excellent temporal horizon markers.

Nine cultural horizons have been identified which can be correlated throughout the region based on stratigraphy. These zones consist of the upper level of organics, organic silts, and the contact between them, the surfaces of the four tephras, and the surface of the glacial drift or bedrock (Dixon et al. 1982a:5-19). In some cases paleosols are present between the tephra. Dating of these paleosols assists in establishing limiting dates for the tephra falls.

The chronological documentation of sites and components within the project area is based upon four methods: 1) the direct historic approach, 2) radiocarbon determinations, 3) relative stratigraphic placement, and 4) typological comparisor of artifact assemblages with similar assemblages from dated sites. The nine cultural horizons can be dated within limits, although the time span represented by specific cultural horizons may vary from a few hundred years to as much as 7,000 - 8,000 years for cultural horizon 9. Five major cultural traditions, each characterized by a unique artifact assemblage have been documented within the study area. These are: 1) Euro-American tradition (0 - 100 B.P.) (cultural horizon 1), 2) the Athapaskan tradition (100 - ca. 1500 B.P.) (cultural horizons 2, 3, 4, 5), 3) Late Denali complex (ca. 1500 - 3400 B.P.) (cultural horizons 5?, 6, 7) 4) Northern Archaic traditon (ca. 3400 - 5000 B.P.) (cultural horizon 8), and 5) American

Paleoarctic tradition (ca. 5000 - 10,500 (?) B.P.) (cultural horizon 9). Although the oldest dated sites in the study area do not exceed ca. 7,000 radiocarbon years it is possible that human occupation in this portion of Alaska may span the last ca. 10,500 years.

Due to the unlikelihood of dating all strata at every site, an emphasis is placed upon the relative dating potential of the tephra units. The widespread distribution of the tephra deposits allows correlations to be made between all parts of the study area. The association of cultural horizons with stratigraphic units enables the construction of cultural components based upon the artifact assemblages of a number of sites sharing the same stratigraphic position.

3.4 - Artifacts

An artifact can be considered as any object which owes one or more attributes to human activity. It can be faunal and floral material brought onto the site, structures and features, and items modified from stone, bone, wood, or other raw material. The major categories of artifacts are lithic remains which can be sorted according to material type and function, faunal remains, flora, non-lithic artifacts, and features.

Various types of lithic artifacts have been defined for the study area. These include: modified flakes, scrapers, blades, microblades, burins, burin spalls, bifaces, bifacial preforms, notched points, stemmed points, leaf shaped points, lanceolate points, triangular points, microblade cores, microblade core tablets, blade cores, rejuvenation flakes, flake cores,

hammerstones, abraders, and notched pebbles. The definitions of each of the tool types may be found in the Procedures/Quality Assurance Manual (Revised May 1984). Information is also recorded on the occurrence of the non-tool categories of unmodified lithic flakes, thermally altered rock, ochre, and cobbles and fragments.

Eight commonly occurring types of raw material used in the production of lithic artifacts have been identified in the study area. These raw materials are argillite, basalt, chalcedony, chert, obsidian, quartz, quartzite, and rhyolite. The number and type of tool according to raw material are recorded for the artifact assemblage of each component of a site or locus.

Provisions have been made for recording the occurrence of faunal remains for the variety of animals present in the Middle Susitna River Valley. Fauna include the subsistence species such as: caribou, moose, sheep, and bear; the furbearing species of wolf, fox, wolverine, and hares; and the rodents, birds, fish, and insects which may be incorporated into the site either intentionally or as a result of non-cultural deposition. Special emphasis is placed upon caribou due to the probable importance of this species in the subsistence regime. By recording the presence of specific skeletal elements, patterns of subsistence activities may be elucidated.

The presence and absence of floral remains are recorded for their possible role in the subsistence round, paleoecological interpretations, and for their dating potential. Floral remains can also contribute to a better understanding of past climatic and vegetation regimes. The information

recorded for flora consists of the presence of seeds and macrofossils and whether the material has been charred.

Other artifacts made of bone/antler, metal, glass, and wood have been recovered in the study area. Features which are recorded include cultural depressions, hearths, historic structures of cabins, caches, etc., and stone constructions such as cairns or hunting blinds.

3.5 - Summary

Contextual information on the geographic and environmental setting, stratigraphic and cultural components, and the artifact assemblages represented by each component are major variables by which the research potential of sites in the Susitna Hydroelectric Project area is assessed. Additional variables will be added as required to address new avenues of research.

4 - RESEARCH QUESTIONS

4.1 - Introduction

One aspect of the Cultural Resources Survey of the Susitna Hydroelectric Project is designed to address major issues relating to the research potential, and thereby the significance, of sites within the study area. The position of the project at the proposed linguistic juncture of the Tanaina and Ahtna (Krauss 1982) and geographically located adjacent to the southern flanks of the Alaska Range, the Copper River Basin, and the lower Susitna River region allow for the study of archeology and history between groups of south central Alaska and those of the Alaskan Interior. The identification of readily distinguishable tephra units in the stratigraphy provides a unique opportunity in Alaskan archeology for the establishment of an area-wide correlation of sites. These factors have been considered in the collection and management of data for assessing the significance of sites in the region. Five major research areas have been identified: 1) Cultural Chronology, 2) Possible Effects of Tephra Falls on Prehistoric Human Ecology, 3) Subsistence and Settlement, 4) Population Dynamics / Exchange and Diffusion, and 5) Ethnography and History.

Each major research area is discussed briefly with the major topics of interest followed by a list of questions pertinent to the topics. In order to determine which sites are appropriate for contributing to the analysis of each question, a series of required contextual variables is presented. These variables were introduced in the previous section and are available for every site which has been investigated. In addition, ancillary variables which may

have a bearing on the interpretation of the research or may lead to other fruitful avenues of research are listed. Criteria affecting the ability of a site to address a particular research question are also presented as a means of establishing the non-significance of a site.

4.2 - Criteria of Non-Significance

Factors affecting the research potential of a site are predominantly those of preservation and condition of deposits (Schiffer and Gumerman 1977:242). These factors are common to the assessment of the value of every site. Criteria for non-significance are discussed in this section rather than repeated after each question. When additional mitigating circumstances are present, they will be noted for that particular question.

A site is considered not relevant, and therefore non-significant, to the research potential of a particular question when it does not possess the required suite of variables necessary to address the topic. Sites which do possess the required variables may be deemed unsuitable due to the poor state of preservation, e.g., bone present but in the form of bone meal, or when the integrity of relevant stratigraphy is lacking as a result of erosion, cryoturbation, or adverse human impact.

4.3 - Chronology

The chronological documentation of sites and components was reviewed in section 3.3. To date, five major cultural traditions and complexes, each characterized by specific configurations of associated cultural traits which

persist over a long period of time have been documented within the study area. These are: 1) Euro-American tradition (0 - 100 B.P.) (cultural horizon 1), 2) the Athapaskan tradition (100 - ca. 1500 B.P.) (cultural horizons 2, 3, 4, 5), 3) Late Denali complex (ca. 1500 - 3400 B.P.) (cultural horizons 5 (?), 6, 7, 9), 4) Northern Archaic tradition (ca. 3400 - 5000 B.P.) (cultural horizon 8), and 5) American Paleoarctic tradition (ca. 5000 - ? 10,500 B.P.).

Issues related to how and why cultural traditions have changed are central to understanding the culture history of the region. The following questions address these issues.

a) The temporal boundaries for each tradition are poorly understood with the exception of the Euro-American and the late phase of the Athapaskan traditions. Additional research is required at individual sites which fall on cultural horizons that suggest they hold the potential to document temporal limits of each tradition.

i) Required variables:

cultural horizons 4, 5, 8, or 9 AND

datable material

ii) Ancillary variables:

artifact type

artifact raw material

iii) Criteria for non-significance

see section 4.2

b) The nature and form of transitions between traditions are poorly understood in the Susitna Canyon area. Are the observed changes in artifact assemblages the result of population replacement, diffusion of artifact types, in situ development, or some combination of the above?

i) Variables required:

cultural horizons 2 and 5 OR

cultural horizons 5 and 7 OR

cultural horizons 7 and 8 OR

cultural horizons 8 and 9 AND

artifact types other than unmodified flakes

ii) Ancillary variables:

radiocarbon dates

artifact raw material

iii) Criteria for non-significance:

see section 4.2

4.4 - Possible Effects of Tephra Falls on Prehistoric Human Ecology

Evidence for four prehistoric tephra falls, occurring during an interval of at least 3,000 years from about 5,000 years B.P. to roughly the beginning of the

Christian Era, is widespread in both cultural and non-cultural contexts throughout the Susitna Canyon area. The Susitna tephras may correlate roughly in time with tephra deposits at other central Alaskan locales, indicating a fairly extensive distribution for these ash deposits.

Often overlooked in the archeological literature is the fact that emplacment of tephra on the landscape undoubtedly had some effect (positive or negative) on the prehistoric population inhabiting an area. Whether the effect was long-term and resulted in a large-scale emigration of people as suggested by Workman (1974, 1979) for the Yukon Basin, or only short-term as suggested by Dumond (1979) and Black (1981) for the Alaska Peninsula and the Aleutians, respectively, has yet to be resolved for the Susitna Canyon area. Environmental data, specifically data on plant and animal recovery in regions affected by historic volcanic activity and contemporary wildlife studies, can provide useful information for the formulation of models with which to assess the possible impact on people occupying or utilizing the Susitna area at the time of the tephra falls.

If the effects were only short-term in extent, major changes in artifact assemblages or major hiatuses in site occupation would not be expected to occur in the archeological record. On the other hand, what might be expected is evidence of shifts in settlement pattern or fluctuations in population density that may have resulted due to impact on the floral and faunal resources of the area. The following questions seek to address the above hypotheses on the impact of tephra falls.

a) One effect of prehistoric tephra falls on human populations occupying the Susitna Canyon area may have been a shift in settlement. Is there any evidence for a marked change in settlement pattern before and after ash fall events?

i) Variables required:

cultural horizons 5, 6, 7, 8, or 9 OR

stratigraphic units 5, 6, 7, 8, 9, 10, 11, 12, or 13

ii) Ancillary variables:

site size

land form

view

proximity to other sites

iii) Criteria of non-significance:

see section 4.2

b) The impact of tephra falls on past vegetational regimes in the project area may have affected caribou by causing their numbers to decrease (or possibly increase) their distribution or migration patterns to shift. Is there any archeological evidence for a change in caribou availability or distribution before and after ash fall events?

i) Variables required

cultural horizons 5, 6, 7, 8, or 9 OR

stratigraphic units 5, 6, 7, 8, 9, 10, 11, 12, or 13 AND

caribou bones

ii) Ancillary variables:

landform

view

proximity to other sites

iii) Criteria of non-significance:

see section 4.2

poor faunal preservation

c) The impact of tephra falls on caribou herds and in turn on human populations dependent on them would be quite different if caribou were only a seasonally important resource as opposed to the primary resource on a year-round basis. Is there any evidence to suggest that caribou were only important seasonally and, if so, did this change over time?

i) Variables required:

cultural horizons 5, 6, 7, 8, or 9 OR

stratigraphic units 5, 6, 7, 8, 9, 10, 11, 12 or 13 AND

caribou skeletal elements that can be used as seasonal

indicators, e.g., teeth, antlers, and elements displaying attributes indicative of the seasonal birth cycle (size, epiphyseal closure, etc.)

ii) Ancillary variables:

floral remains

iii) Criteria of non-significance:

see section 4.2

poor faunal preservation

d) According to Workman's (1974, 1979) hypothesis, catastrophic ash falls in Interior Alaska may have caused emigration of one group of people and re-occupation at a later date by another population. This may be confirmed with distinct changes in artifact assemblages. Is such a pattern evident in the project area?

i) Required variables:

cultural horizons 5, 6, 7, 8, or 9 OR

stratigraphic units 5, 6, 7, 8, 9, 10, 11, 12, or 13 AND

diagnostic artifacts associated with the five major cultural traditions documented, e.g., microblades, microblade cores, or microblade tablets, side notched projectile points, etc.

ii) Ancillary variables:

none

iii) Criteria of non-significance:

see section 4.2

e) The intensity of land use can be measured by the number, size, and artifact density of sites. Is there evidence to suggest that the intensity of land use in the Susitna Canyon area increased through time or fluctuated as the result of the ecological impact of tephra falls?

i) Required variables:

cultural horizons 5, 6, 7, 8, or 9 OR

stratigraphic units 5, 6, 7, 8, 9, 10, 11, 12, or 13 AND

number of sites

site size

artifact density

ii) Ancillary variables:

none

iii) Criteria of non-significance:

see section 4.2

4.5 - Subsistence and Settlement

The general topic of subsistence and settlement may best be viewed from the examination of a number of lesser topics which deal with, but are not limited to: 1) the present and past landscape, 2) present and past food resources,

3) site location, 4) site size, 5) site density. Because of poor organic preservation at some levels it may not be possible to address some topics in more than a speculative manner.

Prehistoric settlement information is probably the most abundant kind of data obtained which relates to issues of subsistence and settlement. The most direct approach for gaining subsistence information from sites is the identification of floral and faunal remains in past contexts. Unfortunately, acidic soils and post-depositional transformations preserve only the most durable kinds of materials (i.e., lithics). As a result, the amount of preserved organic remains is minimal and this situation escalates with progressively older occupations. Fortunately some depositional environments in the project area have allowed organic preservation. For instance, bone fragments of small mammals, birds, and caribou have been recovered at various sites. These remains do not allow for a reliable assessment of minimum numbers of individuals or percentage of the diet. Nor can reliable statements be made about the most preferred subsistence resource at sites. In addition to faunal remains, macrofossils of floral specimens have been recovered from some paleosols at various sites. Given the poor organic preservation, sites which do preserve organic material within and outside of the paleosol are very important.

a) Is there a change in subsistence practices between the American Paleoarctic and Northern Archaic periods, and what evidence is there to support or refute this change?

i) Required variables:

cultural horizons 8 or 9 OR

stratigraphic units 11, 12, or 13 AND

microblades or

notched points

ii) Ancillary variables:

floral remains

faunal remains

iii) Criteria of non-significance:

see section 4.2

b) The Late Denali Complex in the Alaskan Interior may have been an in situ development from previous occupations or represent an immigration of people from outside the area. Evidence associated with the intensity of occupation and artifact composition may help clarify this settlement problem. What evidence exists for either of these propositions?

i) Required variables:

cultural horizons 6, 7, or 8

artifact types other than unmodified flakes

site size

ii) Ancillary variables:

artifact raw material

iii) Criteria of non-significance:

see section 4.2

c) Among the Ahtna, the placename for Jay Creek is Nac'elcunt Na' ("food is stored again creek") (Kari 1983). A number of mineral licks occur along Jay Creek and in the hills to the west upon which local sheep populations depend. Do sites which are adjacent to mineral licks possess a distinctive artifact assemblage which may be related to sheep predation?

i) Variables required:

mineral licks in close proximity

ii) Ancillary variables:

artifact type

artifact material type

iii) Criteria of non-significance

see section 4.2

d) Many of the small sites within the project area tend to be located on small, glacially formed knolls (kames) which provide a panoramic view of surrounding lower land features. These sites are commonly characterized as overlooks or hunting stations. Is there a diagnostic artifact assemblage at these sites which might explain their size and location?

i) Required variables:

landform of kame, hill, or esker

at least 270 degree view

ii) Ancillary variables

artifact type

artifact raw material

site size

iii) Criteria of non-significance

see section 4.2

e) During the Northern Archaic period salmon were exploited in areas adjacent to the Susitna Canyon. Is it possible that Northern Archaic sites within the Susitna Canyon area participated in a larger settlement and subsistence cycle which included salmon procurement sites outside of the area?

i) Variables required:

cultural horizon 8 AND

notched pebbles or fish remains

ii) Ancillary variables:

artifact type

site size

iii) Criteria of non-significance:

see section 4.2

4.6 - Population Dynamics / Exchange and Diffusion

A major humanistic and archeological question is the identity of the people whose cultural remains are being uncovered in the Susitna Canyon area. How far back can the use of the the region by the current groups of Ahtna and Tanaina be documented? The association of archeological assemblages with that of neighboring regions may aid in identifying the former inhabitants of the project area.

The ability to segregate sites on the basis of common stratigraphy allows for the study of site density through time. The currently large, and expanding, data set from the project may reveal temporal trends in the occupation of the Susitna Canyon area. These trends may then be correlated with climatic change and effects of the tephra falls which may have affected the subsistence resources of the region and thereby the degree and frequency of occupation. The magnitude of tephra falls themselves may have had a demonstrable effect upon occupation of the project and adjacent areas.

In addition to the intensity and duration of occupations, the introduction and transmission of items into and through the project area can be studied. Material sourcing of raw material and technological similarities with adjacent regions can provide information on the relationship of the study area to the remainder of Alaskan archeology. Archeology conducted along the Alyeska oil pipeline and natural gas pipeline corridors, in the Copper River basin, and the sites of Healy lake, Dry Creek, Carlo Creek, and the Nenana River Gorge

Site provide information which can be used to place the Susitna Canyon within a broader regional framework. On a broader scale, the major technological phases in Alaskan prehistory can be tested for their presence in the Susitna Canyon region and thus expand the understanding of the dynamics of distribution, timing, and variability of the phases.

a) West (1981:224-227) has recently postulated a cultural hiatus between the Denali Complex at 7,000 B.P. and the appearance of the Northern Archaic at 4,000 B.P. in the Tangle Lakes region northeast of the project area. Do early sites in the Susitna Canyon show an affiliation with the Denali Complex between 7,000 B.P. and 4,000 B.P. and thus refute the existence of a hiatus in occupation?

i) Required variables:

cultural horizon 9 OR

cultural horizon unknown with microblade technology

ii) Ancillary variables:

artifact types

iii) Criteria of non-significance

see section 4.2

b) A number of obsidian sources have been identified in Alaska and the Yukon Territory. Can obsidian from the project area be traced to specific sources and thus yield information on past interaction or exchange networks?

i) Required variables:

obsidian

ii) Ancillary Variables:

artifact types

iii) Criteria of non-significance:

see section 4.2

c) Few prehistoric structures or more permanent camps are known from within the confines of the project area. Are there environmental settings which typify these rare sites?

i) Required variables:

cultural depressions OR

hearths OR

rock features

ii) Ancillary variables:

vegetation

elevation

terrain unit

site size

iii) Criteria of non-significance:

see section 4.2

d) The paleosol between the Oshetna and Watana tephras may also be present at the sites of Dry Creek (Thorson and Hamilton 1977) and at Gerstle River Quarry (Kotani, Cook, and Nishimoto 1984). Comparisons of cultural horizon 8 of the Susitna project with the archeological unit IV at Dry Creek 100 km to the northwest of the project and the upper component at Gerstle River Quarry 150 km to the northeast of the project enable regional variation within the Northern Archaic to be studied with the possible delineation of exchange and diffusion networks.

i) Required variables:

cultural horizon 8 AND

artifact types

ii) Ancillary variables:

artifact raw materials

iii) Criteria of non-significance:

see section 4.2

e) Is there any evidence to suggest that the intensity of land use in the Susitna Canyon area decreased at the onset of Neoglacial times at approximately 3300 B.P.?

i) Required variables:

cultural components with upper limiting dates between 4300 - 3300 years B.P. OR

cultural components with upper limiting dates between 3300 - 2300 years B.P.

ii) Ancillary variables:

number of sites

site size

artifact density

iii) Criteria of non-significance:

see section 4.2

4.7 - Ethnography and History

At the time of historic contact, the upper Susitna drainage was occupied by the Western Ahtna, one of several groups of Athapaskan speakers inhabiting Interior Alaska. Through implementation of the direct historical approach, the Athapaskan Tradition can be traced back to approximately A.D. 500 in the study area. Although ethnohistoric data have provided archeologists with useful information for interpreting sites falling within this time period, much remains to be learned about the origin, population dynamics, settlement and subsistence of these prehistoric people.

Indirect impact of Euro-American culture on the Ahtna was experienced as early as the late 1700's, at which time iron and glass beads imported by Russian traders became available to peoples with whom the Ahtna had established trade connections (Workman 1977). The first actual population expansion by non-natives into the upper Susitna occurred shortly after 1895 when gold was

discovered in the Cook Inlet region. Following the goldrush, fur trappers began to move into the Susitna River area. The economic use of the area for fur trapping during the 1920's to 1940's is documented by abandoned cabins from this period. The effects of both indirect and direct white contact on the Ahtna are the subject of the questions in this section.

a) The Mountain Band of Ahtna Athapaskans no longer occupy the Susitna Canyon area. When did depopulation occur and what were the factors contributing to it?

i) Required variables:

cultural horizons 3, 4, or 5 OR

stratigraphic units 3, 4, or 5 OR

radiocarbon dates between A.D. 1700 and A.D. 1900

ii) Ancillary variables:

landform

faunal remains

floral remains

iii) Criteria of non-significance:

see section 4.2

b) Seasonal variation in subsistence strategies are known for Athapaskans in Interior Alaska. Was the seasonal exploitation of resources during the Athapaskan Tradition (100 - ca. 1500 B.P.) similar to the pattern known for modern Athapaskans?

i) Required variables:

cultural horizons 3, 4, or 5 OR

stratigraphic units 3, 4, or 5 OR

radiocarbon dates between A.D. 500 and A.D. 1900 AND

faunal remains

ii) Ancillary variables:

floral remains

iii) Criteria of non-significance:

see section 4.2 .

poor faunal preservation

c) Salmon are an important portion of the Athapaskan diet and major sites are located to utilize this resource. Although very few salmon migrate past Devil Canyon there is a major salmon run into Stephan Lake. Has this resource been used in periods that precede the Athapaskan period?

i) Required variables:

cultural horizons 6, 7, 8, or 9, OR

stratigraphic units 6, 7, 8, 9, 10, 11, 12, or 13 OR

radiocarbon dates before A.D. 500 AND

salmon bones or notched pebbles

ii) Ancillary variables:

faunal remains

landforms

iii) Criteria of non-significance:

see section 4.2

poor faunal preservation

d) Minor variations in the climate can affect both plants and animals. The so-called "Little Ice Age" occurred in the 1600's. Did this have an effect on the native populations living in the Susitna Canyon area?

i) Required variables:

radiocarbon dates between A.D. 1600 and A.D. 1700

ii) Ancillary variables

location

faunal remains

floral remains

iii) Criteria of non-significance:

see section 4.2

poor faunal preservation

e) Indirect trade of Russian and European products occurred in Alaska prior to the first recorded contact by Vitus Bering in 1728. Did indirect trade occur in the Susitna Canyon area, and, if so, can anything be learned about trade routes?

i) Required variables:

cultural horizons 3, 4, or 5 OR

stratigraphic units 3, 4, or 5 OR

radiocarbon dates between A.D. 1700 and A.D. 1900 AND

glass or metal

ii) Ancillary variables:

site location

iii) Criteria of non-significance:

see section 4.2

f) The influence of non-natives on native populations often produces change in various aspects of tradition life, including, but not limited to, subsistence, material culture, social structure, trade, and religion. This influence may have been felt in the Susitna River area as a result of gold mining and fur trapping by non-natives during the early decades of the 1900's. What effect, if any, did these activities have on native populations living in or in close proximity to the Susitna Canyon area?

i) Required variables:

cultural horizons 1, 2, 3, 4, or 5 OR

stratigraphic units 1, 2, 3, 4, or 5 OR

radiocarbon dates between A.D. 1900 and A.D. 1949 AND

log structures OR

metal or glass

ii) Ancillary variables:

site location

iii) Criteria of non-significance:

see section 4.2

4.8 - Future Research

The research questions subsumed under the above five research topics are not exhaustive. Additional topically oriented research may be generated through the analysis of the above questions and as a result of additional fieldwork.

5 - REFERENCES

Advisory Council on Historic Preservation. 1980. Treatment of archeological properties: a handbook. Government Printing Office, Washington, D.C.

Anderson, B.A. 1974. An archaeological assessment of Amisted Recreation Area. Division of Archaeology, Southwest Region, U.S. National Park Service, Santa Fe, New Mexico.

Barnes, M.R., A.K. Briggs, and J.J. Neilsen. 1980. A response to Raab and Klinger on archaeological site significance. American Antiquity 45:551-553.

Black, L. 1981. Volcanism as a factor in human ecology: the Aleutian case. Ethnohistory 28(4):313-340.

Dixon, E.J. In press. Context and environment in taphonomic analysis: examples from Alaska's Porcupine River caves. Quaternary Research Special Volume - Taphonomic Analysis and Interpretation in Pleistocene Archeology. E. James Dixon and Rober M. Thorson (eds).

Dixon, E.J., G.S. Smith, R.M. Thorson, and R.C. Betts. 1980. Annual report, subtask 7.06 cultural resources investigations for the Susitna Hydroelectric Project. University of Alaska Museum, Fairbanks.

DRAFT

Dixon, E.J., G.S. Smith, R.C. Betts, and R.M. Thorson. 1982a Final report subtask 7.06 cultural resources investigations for the Susitna Hydroelectric Project: a preliminary cultural resource survey in the Upper Susitna River Valley. University of Alaska Museum, Fairbanks.

Dixon, E.J., G.S. Smith, M.L. King, and J.D. Romick. 1982b. Final report 1982 field season subtask 7.06 cultural resources investigation for the Susitna Hydroelectric Project: cultural resource survey in the Middle Susitna River Valley. University of Alaska Museum, Fairbanks.

Dixon, E.J., G.S. Smith, W. Andrefsky, Jr., B.M. Saleeby, C.J. Utermohle, and M.L. King. 1984. 1983 field season cultural resources investigations, Susitna Hydroelectric Project. University of Alaska Museum, Fairbanks.

Dixon, K.A. 1977. Applications of archaeological resources; broadening the basis of significance. IN Conservation Archaeology, ed. M.B. Schiffer, and G.J. Gummerman. Academic Press, New York.

Dumond, D.E. 1979. People and pumice on the Alaska Peninsula. IN Volcanic Activity and Human Ecology, ed. P. Sheets, and D.K. Grayson. Academic Press, New York.

Finley, D.E. 1965. History of the National Trust for Historic Preservation, 1947-1963. National Trust for Historic Preservation, Washington, D.C.

Glassow, M.A. 1977. Issues in evaluating the significance of archaeological resources. American Antiquity 42:413-420.

DRAFT

Grady, M.A. 1977. Significance evaluation and the Orme Reservoir Project. IN Conservation Archaeology, ed. M.B. Schiffer, and G.J. Gumerman. Academic Press, New York.

Kari, J. 1983. Ahtna place names lists. Copper River Native Association and Alaska Native Language Center.

Kling, T.F., P.P. Hickman, and G. Berg. 1977. Anthropology in Historic Preservation: Caring for Culture's Clutter. Academic Press, New York.

Kotani, Y., J.P. Cook, and T. Nishimoto. 1984. Walker Fork and Gerstle River Quarry sites: a preliminary report of the 1983 excavations. Paper presented at the 11th annual meeting of the Alaska Anthropological Association, Fairbanks.

Krauss, M.E. 1982. Native peoples and languages of Alaska (map). Alaska Native Language Center. University of Alaska, Fairbanks.

Lynott, M.J. 1980. The dynamics of significance: an example from central Texas. American Antiquity 45:117-120.

Moratto, M.J. 1975. On the concept of archaeological significance. Paper presented at the annual northern California meeting of the Society for California Archaeology, Fresno.