Annual Report
Archaeological Survey and Data Recovery:
Donnelly Training Area, Fort Wainwright, Alaska 2009

2010

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Aaron C. Robertson

Copy Edited by:
Sarah McGowan

Prepared by:
Center for Environmental Management of Military Lands
Colorado State University
Ft. Collins, CO 80523-1500

Lisa Graham
Cultural Resources
Directorate of Public Works
U.S. Army Garrison Fort Wainwright
Fort Wainwright, AK

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List of Acronyms

AHRS – Alaska Heritage Resource Survey

AMT - The Alaska Meteorological Team (AMT) at the Central Meteorological Observatory, Fort Greely

APE - Area of Potential Effect

BAX - Battle Area Complex

bs - below surface

CEMML - Center for Environmental Management of Military Lands, Colorado State University

DOE - Determinations of Eligibility

DTA - Donnelly Training Area

FP - Firing Points

FWA – Fort Wainwright

ICRMP - Integrated Cultural Resources Management Plan

m asl - meters above sea level

MOU - Memorandum of Understanding

NHPA - National Historic Preservation Act

NRHP - National Register of Historic Places

OP - Observation Points

SDZ - Surface Danger Zone

SHPO - Alaska State Historic Preservation Officer (SHPO)

TR - Texas Range

USARAK - U.S. Army Alaska

USAG FWA - United States Army Garrison, Fort Wainwright

XRF - X-ray fluorescence

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Field Director James Quinn III

Laboratory Manager Heather D Hardy

Archaeological Field Technicians

Vanessa Aziz	Hayley E Brown
William A Brown *	Kelsey C Chase
James P Devereaux	David W Cory
Malissa G Fellman	Christine A Fik
Joshua T Hamilton	Maureen P Howard
Kyle S Johnso	James Kunesh
Amanda K Lawson	Jordan C McIntyre
Whitney McLaren	Elspeth A Miner
Hannah R Morris	Jaclyn C Rogers
Alicia H Sawyer	Gerad M Smith
Elizabeth L Watts	Emily J Wicke

* Archaeology field crew leader

Archaeological Aids

Hana Brown	Sherwood R Byam
Brooke E Carey	Matthew M Creager Jr.
Alberta L David	Allie S Pelto
Meranda L Sam	

Data Entry Jordan Anderson

1.0 Introduction

In 2009, the U.S. Army Alaska (USARAK) and United States Army Garrison, Fort Wainwright (USAG FWA) undertook the development of several proposed projects, which triggered an archaeological and cultural resources analysis of proposed areas of potential effect (APE). This report details the archaeological review and analysis that was conducted for each undertaking on lands at Donnelly Training Area (DTA), Fort Wainwright (Figure 1). The surveys were conducted by the USAG FWA and the Center for Environmental Management of Military Lands (CEMML), Colorado State University.

Survey and sub-surface testing were conducted following procedures defined in USAG FWA archaeological methodology (Robertson et al. 2007) and Integrated Cultural Resources Management Plan (ICRMP) Office of History and Archaeology 2001 for archaeological survey and the U.S. Army Alaska's Monitoring and Data Recovery Plan for Cultural Resources within the Battle Area Complex Surface Danger Zone, Fort Wainwright, Donnelly Training Area, 2009 (Robertson 2009) for data recovery. Where archaeological sites were identified within a project's APE, evaluative testing was conducted to determine eligibility for listing on the National Register of Historic Places (NRHP), based on National Register Criteria detailed in 36 CFR 79, and pursuant to Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800).

Archaeological field crews, comprised of employees of CEMML, conducted surveys of areas potentially impacted (both directly and indirectly) by proposed undertakings. An archaeological crew of 35 conducted data recovery work in the Donnelly Training Area (DTA).

1.1 Setting

The DTA is located in central Alaska, north of the Alaska Range in the Tanana River valley. The post lies 120 miles south of the Arctic Circle near the city of Delta Junction. The DTA consists of the West and East Training Areas and three outlying training sites: Gerstle River Training Area, Black Rapids Training Area (BRTA), and Whistler Creek Rock Climbing Area. The DTA West is an 894 square-mile parcel bounded by the Delta River to the east and the Little Delta River to the west. It covers approximately 571,995 acres. The East Training Area is an 81 square-mile parcel stretching east of the Delta River to Granite Creek. It covers approximately 51,590 acres.

The DTA has the northern continental climate of Interior Alaska, which is characterized by short, moderate summers; long, cold winters; and low precipitation and humidity. Weather is influenced by mountain ranges on three sides that form an effective barrier to the flow of warm, moist maritime air during most of the year. Surrounding upland areas tend to aid drainage and the settling of cold arctic air into the Tanana Valley lowlands (Natural Resources Branch 2001).

The Alaska Meteorological Team (AMT) at the Central Meteorological Observatory, Fort Greely and Donnelly Training Area, monitors weather at the post. According to their records, average monthly temperatures range from -6.4ºF in January to 60.0ºF in July, with an average annual temperature of 27.4ºF. The record low temperature is -63ºF, and the record high is 92ºF. The average frost-free period is 95-100 days (based on 27 years of AMT data).

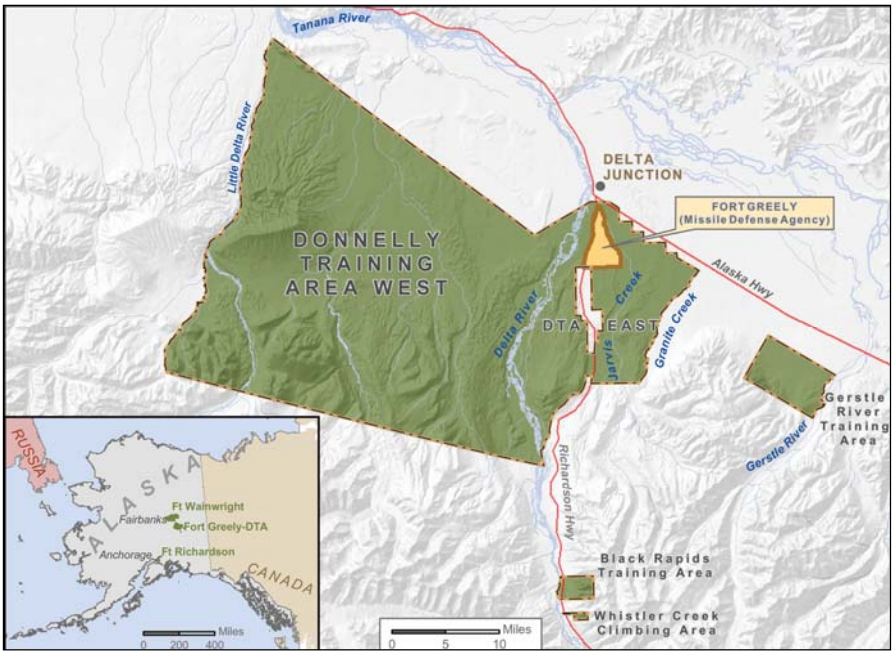

Figure 1. Location of Fort Wainwright's Donnelly Training Area

Prevailing winds are from the east-southeast from September through March and from the west, southwest, or south from April through August. Average wind velocity is 8.2 miles per hour (mph). The greatest wind speeds occur during winter, with a record of 104 mph recorded in the month of February. Winds are 5 mph or less only 13.6 percent of the time, and wind speeds greater than 60 mph have been recorded in every month. Thunderstorms are infrequent and occur only during summer (based on 27 years of AMT data) (Natural Resources Branch 2001).

Average annual precipitation is 11.12 inches, which falls over 90.4 days, mostly during summer and early fall. Average monthly precipitation ranges from a low of 0.24 inches in April to a high of 2.38 inches in June. Average annual snowfall is 40.5 inches (based on 27 years of AMT data), with a record 99.7 inches in 1945 (Natural Resources Branch 2001).

2.0 Literature Review

2.1 History

The DTA lands fall within an area occupied at the time of Euro-American contact by Lower-Middle Tanana Athabaskans (Andrews 1975:177; McKennan 1981:564; Mishler 1986). Traditional settlement patterns focused on a widely mobile seasonal round, with the fall caribou hunt playing a pivotal role in subsistence preparations for the winter, while summer activities were focused at fish camps and in berry and root collecting and sheep hunting (McKennan 1981:565). These activities frequently had a communal focus, with several local 'bands' connected by common interest, geography, and intermarriage. Despite attempts to define anthropological 'boundaries' for the peoples living in the lower Tanana River valley, natural terrain served as the only definable 'boundary' to settlement patterns (McKennan 1981).

As Euro-American traders, miners, missionaries, and explorers moved into the Tanana River valley, the traditional lifestyles of local Athabaskan groups were disrupted. Access to trade goods and the development of the fur trade not only affected traditional material culture, but also began to dramatically affect subsistence activities and settlement patterns. Similarly, the advent of missionary activities in the Interior of Alaska profoundly affected traditional social organization. The introduction of mission schools for Native children and the doctrine of new religious beliefs contributed to an erosion of traditional settlement patterns and practices (McKennan 1981).

In 1898, the discovery of gold in the Tanana uplands began a rush of Euro-American settlement into the Tanana River valley. As the economic importance of the valley increased, the need for reliable transportation routes and communication systems rose in tandem. Existing trails, such as the Bonnifield, Donnelly-Washburn, and Valdez-Fairbanks trails, saw increased use and development in the first decade of the 20th century. This increase in activity also resulted in the establishment of several roadhouses and posts. In 1906, Congressional appropriations led to improvement of the Valdez-Fairbanks trail, crossing the Alaska Range south of Delta Junction, following the Tanana River to Fairbanks. Completion of the Alaska Railroad in 1923 was followed two decades later by construction of the Alaska Highway in 1942, firmly tying the Alaskan interior to the outside.

Development in the Alaskan interior increased dramatically with the advent of World War II and the subsequent military build-up in Alaska. Of particular significance was the development of airfields near Delta Junction (Fort Greely), Fairbanks (Ladd Field, later Fort Wainwright), and 26 miles southeast of Fairbanks (Eielson Air Force Base). These locations began as lend-lease bases and cold weather testing centers, but soon expanded with the increased need for military support during World War II and later, the Cold War.

2.2 Prehistory

As noted by John F. Hoffecker (1996), Beringian archaeology is in an early phase of development, with archaeologists on both sides of the Bering Strait still working on the construction of cultural chronologies, amidst much debate. This section offers a brief comparison of two different views on Interior Alaska's prehistoric chronology: the chronology present in Alaskan archaeology in some form since the 1960s and one proposed by eminent Alaskan archaeologist Charles Holmes in the mid-1990s.

Traditional chronologies of Alaskan prehistory divide time into periods based on tool forms. Because of the almost continuous flux involved with the many subcategories of an Alaskan prehistory, the following discussion will entail the broadest classification scheme that divides Alaskan prehistory into three traditions: the American Paleoarctic Tradition, the Northern Archaic Tradition and the Athabaskan Tradition.

- ***The American Paleoarctic Tradition (12,400-7,000 years BP)***

  The American Paleoarctic Tradition was originally defined by Anderson (1970) as the earliest microblade-using tradition in the American arctic, with a proposed relationship to Northeast Asian late Pleistocene cultures based on similarities in these distinctive artifact types. The term is now generally used by archaeologists to refer to the earliest archaeological cultures known from Alaska. In Interior Alaska, this tradition includes several complexes or subdivisions proposed by researchers including the Nenana Complex and the Denali Complex.

  The Nenana Complex was identified by Powers and Hoffecker (1989) from sites in the Nenana Valley. This complex is dated at approximately 11,000 years BP with an artifact assemblage that includes triangular or teardrop-shape bifacially worked projectile points ("Chindadn" points), large unifacial chopper-like tools, and flake tools. The Nenana Complex is defined as lacking microblades, microblade cores or burins, and was proposed as predating the Denali Complex, which has a major focus on these types of tools. In the Tanana Valley, Cook termed sites with distinctive triangular points as "Chindadn" sites and dated them at 11,000-10,000 years BP (Cook 1969, 1975; Holmes and Cook 1999).

  The Denali Complex, dated at 10,500 to 8,000 years BP, was originally defined by West (1967) and includes distinctive microblade cores, core tablets and their derivative microblades, large blades, biconvex bifacial knives, certain end-scraper forms and burins. West (1981) later defined the Denali Complex as a regional variant of the American Paleoarctic Tradition.

  The relationship between the proposed Nenana and Denali complexes is as of yet unresolved. As discussed above, some researchers view the Nenana Complex as a bifacial industry that predates the microblade-based Denali Complex. However, current research (e.g. Holmes 1998; 2007; 2008), indicates that microblades and burins were used by the earliest known cultures in Interior Alaska, around 12,000-12,600 years BP, with a later co-occurrence with Chindadn points—the defining artifact type of the Nenana complex.

- ***The Northern Archaic Tradition (6,000-2,000 BP)***

  The hallmark of the Northern Archaic Tradition is the presence of side-notched projectile points (Anderson 1968; Workman 1978). Some researchers, (e.g. Anderson 1968; Dixon 1985) correlate the advent of Northern Archaic technologies, represented by the widespread occurrence of side-notched points throughout Interior Alaska and Northwest Canada, with the establishment of the taiga forest. Generalized similarities between northern side-notched points and point styles associated with middle- to late- Holocene age complexes known from more southern areas of North America, has led to comparisons of Northern Archaic technologies to those of forest-oriented Archaic cultures of the lower 48 states (Anderson 1968). However, it is uncertain that any of the Northern Archaic traits, other than the side-notched points, originated outside of the western subarctic region (Clark 1992). It also is questionable whether the diffusion of a single trait constitutes an archaeological tradition (Cook and Gillespie 1986).

  Utilization of microblade and burin-based industries appears to continue through the middle and late Holocene. An intermediary period known as the Late Denali Complex during which microblades reappeared was once suggested (e.g. Holmes 1978; Dixon

1985) as occurring after the Northern Archaic Tradition. However, with the co-occurrence of microblades, microblade cores and burins in site assemblages with side-notched points, it is now beginning to appear that the Northern Archaic Tradition includes these distinctive artifact types and that the Northern Archaic and American Paleoarctic may be related (Esdale 2007; Potter 2004).

- ***The Athabaskan Tradition (2,000 BP-1880 AD)***

  The Athabaskan Tradition includes late prehistoric and proto-historic cultures generally believed to be the ancestors of Athabaskan tribes who currently inhabit Interior Alaska. Excavated Athabaskan sites are rare; however the limited body of evidence allows for several generalizations. The Athabaskan Tradition includes a reorganization of raw materials, which de-emphasized stone tool making and increased the emphasis on the manufacture of items from native copper and organic materials (Dixon 1985). Assemblages include ground and pecked stone artifacts and an increased use of expedient tools. There was a broadening and diversification of the resource base to include small mammal and freshwater marine animals such as fish and mollusks (Mcfadyen Clark 1981; 1996; Ream 1986; Sheppard, et al 2001; Shinkwin 1979). Athabaskan sites tend to occur in resource-rich areas near lakes, stream and rivers, and are generally characterized by large house pit and cache pit features. Proto-historic Athabaskan assemblages include Euro-American trade goods such as glass beads, and iron implements. Sites of this time period reflect the increased reliance on outside trade and include log cabins co-occurring with traditional house pits, as well as a change in site location to maximize trading opportunities (Andrews 1975; 1977; 1987; McFadyen Clark 1981; VanStone and Goddard 1981).

Holmes (2001) has proposed an alternative chronology for the Tanana valley. Holmes avoids some of the complications of earlier attempts to create a chronology, in that he does not focus solely on artifact form. Instead, the time periods he suggests are arranged chronologically and "divided according to environmental and cultural criteria" (Holmes 2001:156). These periods are: the Beringian Period, the Transitional Period, the Early Taiga Period, the Late Taiga Period and the Athabaskan Period (Holmes 2001). Holmes' periods encompass the traditional typologies and situate them within an environmental framework to create a chronology for Interior Alaskan prehistory.

- During the Beringian Period (>11,000 years BP) a land connection existed between Alaska and Siberia and steppe-tundra dominated the vegetation. Some artifact assemblages from this period lack microblades; others have them. This difference may be attributable to differences in site environment, function, or seasonality. Holmes proposes the term "East Beringian Complex" to describe these earliest assemblages.

- The Transitional Period (11,000 to 8,500 years BP) is marked by major environmental changes. The land connection to Siberia disappeared, many genera of megafauna became extinct, substantial climatic changes occurred, and forestation began. By 9,000 BP, spruce-birch forest had replaced the shrub tundra in Interior Alaska (Edwards et al. 2000).

- The Early Taiga Period (8,500 to 5,000 years BP) marks the full establishment of the boreal forest. During this period, the American Paleoarctic Tradition gives way to the Northern Archaic Tradition.

- The Middle Taiga Period (5,000 to ca. 2,500 years BP) sees a continuation of the artifact types of the Northern Archaic Tradition, which includes microblades and burins.

- The Late Taiga Period (ca. 2,500 years BP to modern) encompasses the disappearance of microblade technology from the archaeological record. It is also during this period that we see the beginning of the Athabaskan tradition in Alaska, which leads to the technology shift outlined above and to recognizable Athabaskan ethnic groups.

This combination of chronological, environmental, and cultural criteria provides flexibility that is lacking in more traditional chronologies.

2.3 Archaeology

Twenty-five archaeological investigations have been conducted on DTA since 1963, identifying over 400 sites to date (Table 1). The majority of the archaeological surveys conducted in DTA have been limited to DTA East, which comprises 25% of the entire Donnelly Training Area.

Frederick West conducted the first regional survey of the Alaska Range foothills in the 1960s (West 1967). His survey at DTA included the Donnelly and Delta moraine physiographical areas. Along with several other sites, West located the 12 sites that comprise the Donnelly Ridge Archaeological District. This collection of sites has played a significant role in defining the Denali Complex of the American Paleoarctic Tradition.

In 1978, a reconnaissance-level survey was conducted in various areas of Fort Greely and DTA, resulting in the discovery of 62 sites (Holmes 1979). A 1979 survey located four sites (Bacon and Holmes 1980). Northern Land Use Research, Inc. conducted limited archaeological surveys in various areas of DTA during the summer of 1998, resulting in the identification of 16 additional sites (Higgs et al. 1999). Other smaller surveys have also been conducted for specific project areas. All of the sites that have been identified have been located in one of three physiographic settings: high points, bluffs, or terraces overlooking a major river or site drainage, or lake margins. There is an inherent bias in these findings, however, as archaeological investigations have tended to focus on these high-probability settings, to the exclusion of areas predetermined to be lower probability.

USAG FWA began archaeological surveys of large blocks of land within DTA East in 2002 to address proposed infrastructure construction on DTA East. Unlike previous surveys, these provided 100% pedestrian coverage of areas under consideration and an aggressive sub-surface testing strategy. These surveys (conducted 2002-2009) covered 61,000 acres and identified over 320 new sites, of which approximately 190 have been evaluated for eligibility for listing in the NRHP. These sites are primarily prehistoric, but the total includes one site that may be from the Athabaskan Tradition or Early Contact period, which has been determined eligible for the NRHP, and one historic era site (possibly relating to Transportation and Infrastructure) that has not yet been evaluated for eligibility.

The lands within DTA have likely supported human populations for the past 10,000 to 12,000 years. Interior Alaska contains the oldest verifiable prehistoric remains in the state and the region is significant in understanding the peopling of the New World. The oldest radiocarbon date for any item found on DTA is 8,555 (± 380) years BP, from charcoal at site XMH-00297. Some undated material resembles artifacts dated as old as 12,000 BP at other sites in the Tanana Valley.

Table 1. Archaeological survey of DTA East [1]

Year	Researcher	Survey Location	Result
1963-64	West	Various locations on DTA	25 archaeological sites found
1977	Rabich and Reger	XMH-00253	1 site investigated
1979	Bacon	XM-1 Tank Range	No archaeological sites found
1979 [2]	Holmes	Various locations on DTA	62 archaeological sites found
1979 [2]	Bacon and Holmes	Various locations on DTA	6 archaeological sites found
1980a	Steele	Bison Trail DTA East	3 archaeological sites found
1980b	Steele	Squad Assault Range DTA East	No archaeological sites found
1980	Bacon	Cantonment	No archaeological sites found
1982	Steele	Various locations on DTA	No archaeological sites found
1982	Steele	Donnelly Dome Quarry Site	No archaeological sites found
1983	Steele	Texas Range Powerline	1 archaeological site found
1985	Kotani	XMH-00297	1 site investigated
1988	Reynolds	Donnelly Dome WACS	1 archaeological site found
1992	Staley	Various locations on DTA	No archaeological sites found
1995 [2]	Gamza	Sullivan's Roadhouse	1 site investigated
1998 [2]	Higgs et al.	Various locations on DTA	16 archaeological sites found
2002	Goodman	Powerline on DTA East	No archaeological sites found
2002	Hedman et al. 2003	Texas Range, Donnelly DZ, Eddy DZ	110 archaeological sites found [3]
2003	Robertson et al. 2004	Eddy DZ	104 archaeological sites found [3]
2004	Raymond-Yakoubian and Robertson 2005	North Texas and Eddy DZ	10 archaeological sites found
2005	Robertson et al. 2006	Texas Range, DTA Training Areas	39 archaeological sites found
2006	Robertson et al. 2007	DTA Training Areas	26 archaeological sites found
2007	Robertson et al. 2008	DTA Training Areas	5 archaeological sites found
2008	Robertson et al. 2009	DTA Training Areas	32 archaeological sites found

[1] Less than 1 percent of the surveyed area represented in this table was conducted on DTA West.
[2] A portion of this survey was conducted on DTA West.
[3] Some of these sites represent previously reported sites whose locations were not well documented and which were relocated to obtain more accurate data.

3.0 Methodology for Survey

3.1 Survey Methodology

To further build baseline knowledge of the archaeological resources on Army lands in Alaska, and to meet Section 106 obligations, USAG FWA pursued a comprehensive inventory strategy in 2008. This consisted of intensive, 100% coverage of survey units. Unless the survey area was stratified, all accessible areas of each APE were subjected to pedestrian survey, and all high probability locations were subjected to subsurface survey when practical. Areas that are considered inaccessible include high angle slopes (greater than 40º) and wetlands. Stratification of survey areas is based on previous research, distribution of known sites, and knowledge of the survey area terrain. Stratification results from an understanding of the cultural resources that are expected to be encountered in the survey area and the demonstrated distribution of site types among high and low probability terrain. This methodology section of the annual report documents justification for survey stratification and elimination of portions of the APE from field survey.

3.1.1 Pedestrian Survey Methods

All areas not eliminated by pre-survey reconnaissance or classified as wetlands or steep slopes were surveyed. Areas were surveyed using a transect interval of no more than 20 meters (m). Transect intervals decreased in areas of dense vegetation to ensure a visual inspection of the entire survey area. Transect intervals also decreased in areas deemed to have a high potential for containing archaeological sites. Transect intervals below the 20 m minimum were decided in the field by the field crew leader in consultation with the appropriate Post Archaeologist. Survey units were partitioned according to existing roads and trails where possible. When roads did not provide for practical unit boundaries, a one square kilometer work unit was used.

All areas of high potential for subsurface material were systematically shovel tested. There were approximately 20 m between tests; but at times test intervals were shorter. An example of an area that may be tested in 20 m intervals is a long ridgeline or large landform that offers a number of undifferentiated high probability locations. A shorter test interval was used to test small, isolated, high-probability landforms such as an isolated knoll, prominence with a view, lakeside terraces, stream mouths, or level benches adjacent to steeper slopes (this list is not complete and is meant as an example of locations that may be tested intensively). Shovel tests were square or round and measured at least 30 cm in diameter and were excavated to the maximum depth possible. All removed sediment was screened through ¼ inch hardware cloth. The number of tests and approximate location of testing was recorded by crew leaders. Oakfield soil probes were used when necessary to identify sites and features or to delineate site boundaries.

Crew leaders used global positioning systems (GPS), topographic maps, and air photos to record field data. All spatial data was entered into geographic information system (GIS) data files. Crew members recorded their activities in field notebooks. Data recorded daily included date, crew names, crew leader name, activity (e.g. survey, shovel testing, site sampling) and details of crew and individual tasks and activities. Recording of incidental observations regarding weather conditions, technical problems, task efficiency, and task and project coordination was also encouraged.

3.1.2 High- and Low-Probability Locations

Archaeological surveys carried out DTA East from 2002 to 2008 (Hedman et al. 2003; Raymond-Yakoubian and Robertson 2005; Robertson et al. 2004; Robertson et al. 2006; Robertson et al. 2007) indicate that important environmental aspects contributing to site placement include the viewshed, elevation relative to the immediately surrounding terrain, and

distance to water. Lake margins and the tops of small knolls and ridgelines provide the highest probability locations for archaeological sites. Elevated portions of clear streams and anadromous fish streams, stream confluences, and islands are also considered high probability locations. Other high probability locations include benches adjacent to steeper slopes and leading edges of terraces.

Low probability terrain on DTA lands includes flat expanses of spruce forest that lack water, wetlands, and slopes greater than 40º. To date, full coverage surveys have failed to locate any archaeological sites in these settings.

3.1.3 Prehistoric Site Designation

The minimum required for designation of a prehistoric archaeological site is the presence of a single artifact on the ground surface, a single positive shovel test, or a single identifiable feature such as a house depression, cache pit, or hearth. "Sites" defined on the basis of sub-surface finds minimally include a single identifiable artifact or feature such as a flake, manuport, or hearth. Site boundaries are determined during the evaluation phase.

Once a site is identified, a USAG FWA site form is completed, a sketch map is drawn using compass and tape, and a permanent datum nail is installed. If time allows, site boundaries are determined during the site identification phase (see "Site Evaluation Procedures"). Aluminum survey caps are placed on a length of rebar and the rebar is inserted so that approximately 5 cm extends above the ground surface during the evaluation phase. Survey caps are stamped with the site's AHRS number.

3.1.4 Historic Site Designation

Historic archaeological sites are those sites that are greater than 50 years of age that reflect activities after the time of European contact and could not otherwise be designated as prehistoric sites. Most standing structures that are attributable to military use of these lands will lie beyond the purview of archaeological inventory. However, USAG FWA lands contain several property types that are in excess of 50 years of age. Examples include homesteads and mining remains, cabins, aircraft wrecks, roadhouse remains, early trails, and early communication systems. Any property that fits these criteria will be documented as a historic site in the manner prescribed in this methodology.

3.1.5 Artifact Collection

Artifact collection was limited to artifacts retrieved from shovel tests, important diagnostic artifacts found on the surface, and artifacts in immediate danger of destruction. All artifacts collected were recorded on a site map. Artifacts collected were bagged and labeled in accordance with USAG FWA and University of Alaska Museum standards.

3.1.6 Threatened Resources

If cultural material is in immediate danger of destruction, USAG FWA's Cultural Resource Manager is notified. Appropriate mitigation measures are determined in consultation with the Alaska State Historic Preservation Officer and interested Tribal Governments. However, no cultural material was in immediate danger of destruction during the 2009 field season.

3.1.7 Human Remains

No human remains were encountered during the 2009 field season. However, if any human remains, sacred objects, funerary objects, or objects of cultural patrimony had been encountered, any further disturbance would have been avoided. Work would have stopped in the immediate vicinity of the find, measures would have been taken to protect the remains, and

the Cultural Resource Manager would have been notified immediately so that appropriate action could be taken.

Figure 2. Field technician surveying for sites on DTA

4.0 Undertakings

USARAK has one ongoing major range development project, and USAG FWA has proposed four smaller projects on lands at Fort Wainwright's DTA. The DTA's major ongoing range development project, the Battle Area Complex (BAX), is a range designed for gunnery training of vehicle-mounted weapon systems and dismounted infantry platoons, either independently of, or simultaneous with, supporting vehicles (Figure 3).

The smaller projects within the DTA are the development of three engineer digging sites, a maneuver corridor, a theater-specific village and an alternative energy project located at Black Rapid Training Area. Archaeological surveys of the APEs for the proposed projects were conducted from May to September of 2009. No new archaeological sites were identified.

Archaeological field crews, comprised of Colorado State University CEMML employees, conducted surveys of areas potentially impacted (both directly and indirectly) by proposed undertakings.

An archaeological crew of 35 conducted the data recovery work in the Donnelly Training Area. The DTA archaeologist, Aaron C. Robertson, and the seasonal field director, James Quinn III, were the supervising archaeologists for these projects.

Table 2. General survey results for DTA

	2002	2003	2004	2005	2006	2007	2008	2009	Total
Total Area of the Donnelly Training Area	657,000	657,000	657,000	657,000	657,000	657,000	657,000	657,0000	657,000
Area Not Accessible for Archaeological Survey*	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000	139,000
Area Accessible for Archaeological Survey	518,000	518,000	518,000	518,000	518,000	518,000	518,000	518,000	518,000
Number of Field Crew	16	16	8	20	12	20	16	32	108
Total Acreage Surveyed	10,872	29,404	2,223	10,118	6,381	2,184	2,004	1,289	64,475
Recorded Archaeological Sites	100	116	10	39	26	5	32	0	328
Number of Sites Evaluated for Listing in NRHP	20	5	32	51	4	0	80	0	192
Number of Sites Eligible for Listing in NRHP	8	1	19	15	1	0	Pending	0	Pending
Number of Sites Excavated for Data Recovery	0	0	0	0	1	2	0	22	25
Percentage of Accessible Land Surveyed	2%	5%	<0.5 %	2%	1%	<0.5 %	<0.5 %	<0.1 %	10%

4.1 Battle Area Complex (BAX)

U.S. Army Alaska (USARAK) and United States Army Garrison, Fort Wainwright (USAG FWA) have constructed a Battle Area Complex (BAX) on lands at Fort Wainwright's Donnelly Training Area (DTA). The BAX undertaking consisted of two main components: (1) construction of the BAX range complex; and (2) the establishment of a safety buffer area known as a "Surface Danger Zone" (SDZ) downrange of the BAX range complex.

With the transformation of the Army's Alaska-based 176th light infantry brigade to the 176th Stryker brigade in 2003, USARAK and USAG FWA needed new ranges to meet the needs of Stryker vehicle-mounted weapon systems. The largest of these new ranges is termed the Battle Area Complex (BAX). The BAX is designed for gunnery training for crew-served, vehicle-mounted weapon systems and dismounted infantry platoon tactical live-fire operations. Primary features of the BAX include course roads, stationary armor targets, moving armor targets, stationary infantry targets, moving infantry targets, machine gun bunkers and breaching obstacles. In addition to the range, the BAX complex would include an after-action review facility, ammunition breakdown building, ammunition loading dock, operations/storage building, arctic latrines, bleacher enclosure, bivouac, unit staging area, covered mess area, building information systems, electric service, water and septic system, storm drainage and general site improvements.

Survey for the construction footprints of the BAX range complex was conducted in 2002 and 2003 (Hedman et al. 2003; Robertson et al. 2004). Site evaluations and determinations of eligibility (DOEs) for listing in the National Register of Historic Places were conducted in 2004 and 2005 (NRHP) (Raymond-Yakoubian and Robertson 2005; Robertson et al. 2006). On March 17, 2006, USARAK released the BAX/CACTF EIS, and USAG FWA and the Alaska State Historic Preservation Officer (SHPO) entered into Section 106 consultation to mitigate adverse effects of the BAX undertaking.

There are five archaeological sites—XMH-00290, XMH-00873, XMH-00874, XMH-00877 and XMH-01160—located in the BAX construction footprint. Four of these—XMH-00290, XMH-00873, XMH-00877, and XMH-01160—were determined ineligible for listing in the NRHP. Mitigation of adverse effects consisting of an archaeological excavation to recover data from XMH-00874 began in July 2006 and was completed in 2007. The mitigation agreement is detailed in a Memorandum of Agreement (MOA) between USAG FWA and the SHPO signed on July 12, 2006. Section 106 requirements have been completed for the construction footprint of the BAX range complex.

4.1.2 BAX Surface Danger Zone (SDZ)

For the purposes of implementing a Cultural Resource Management strategy, it is important to emphasize the difference between the BAX range complex and the BAX SDZ:

- The BAX range complex includes the maneuver areas, firing points and targets that will be utilized for training (Figure 2).

- The BAX SDZ is an area of risk that extends lengthwise from the firing point to the ultimate ballistic distance or maximum range of munitions utilized at the range. No construction or training activities will occur within the BAX SDZ while the BAX is in use. No targets will be located in the BAX SDZ. Essentially, the BAX SDZ is a downrange

safety buffer zone that covers the maximum distance stray rounds may travel, established for the purposes of protecting human health and safety.

Establishing the SDZ is simply a matter of restricting access to the downrange areas where stray rounds resulting from live fire exercises in the BAX range complex could fall. SDZ's are created to ensure the safety of the public and military personnel. They do not indicate were rounds will most likely go; rather they indicate all possible places where they could go in a completely flat landscape (which the BAX SDZ is not). Different calibers and different munitions have different effective and maximum ranges. Thus, the BAX SDZ is a composite SDZ that incorporates the SDZ's from all the different types of munitions that will be used—from 5.56 mm to 105 mm.

The BAX SDZ is an irregular, fan-shaped area roughly 12 km north to south and 12 km east to west at its widest point. It encompasses 23,741 acres found on the USGS Mount Hayes D-4 topographic map.

Survey efforts have identified 136 archaeological sites within the BAX SDZ. In the early spring of 2009, USAG FWA and the SHPO entered into Section 106 consultation to determine the effects of the BAX SDZ could have on those sites. Through detailed analysis conducted by USAG FWA (U.S. Army Alaska's Monitoring and Data Recovery Plan for Cultural Resources within the Battle Area Complex Surface Danger Zone, Fort Wainwright, Donnelly Training Area, 2009) and in consultation with the SHPO, BLM and Native tribes, it was determined that use of the BAX Range will have no evident effect to sites in the SDZ.

However USAG FWA recognizes that, to a certain extent, effects to sites within the SDZ remain unknown. As a good faith measure, USGA FWA conducted baseline data recovery at 29 archaeological sites located within the first two kilometers of the BAX SDZ: **XMH-00278, XMH-00279, XMH-00842, XMH-00875, XMH-00878/XMH-00908, XMH-00906, XMH-00907, XMH-00909, XMH-00910/XMH-00911, XMH-00912, XMH-00913, XMH-00914, XMH-00915, XMH-00916, XMH-00917, XMH-00919, XMH-00920, XMH-00921, XMH-00923/XMH-00922, XMH-00924, XMH-00925, XMH-00926, XMH-00927, XMH-00945, XMH-01122, XMH-01092 and XMH-01303**. Each of these sites was visited by a crew of CEMML archaeologists during the 2009 field season. All sites were mapped with a high presentation GPS and 2% to 3% of each site with subsurface components was excavated. An interim report detailing these findings is planned within 12 months.

4.2 Designation of Three Engineer Digging Sites

USAG FWA has proposed the designation of three areas within Donnelly Training Area East as engineer digging sites, or "sandboxes." Engineer companies need to gain experience constructing trench systems, tank traps, hull-down positions and other large-scale digging projects. These areas will be set aside for repeated digging operations where engineer companies can operate heavy equipment such as bulldozers, graders, loaders, excavators and backhoes, and will be allowed to remain disturbed. Because this type of training is required on a regular basis, designation of dedicated digging areas will decrease the number of areas that are disturbed.

Observation Point 3

The first designated sandbox site will be located in Training Area 49, in the vicinity of Observation Point (OP) 3 and the Main Supply Route. This area was dominated by black spruce and aspen prior to the 1999 Donnelly Flats Fire but is now vegetated with aspen, willows, shrubs and grasses. The terrain is very level and flat, which will minimize erosion potential.

Observation Point 7
The second designated sandbox site will be located in Training Area 52, at OP 3 next to meadows road (Figure 9). This area is vegetated by spruce with some birch aspen and willows.

Bear Drop Zone
The third designated sandbox site will be located in Training Area 16, at Bear Drop Zone to the east of the Richardson Highway (Figure 10). This area is vegetated by shrubs and grasses; all trees have been removed. The terrain is very level and flat, which will minimize erosion potential.

All three of the proposed sandbox locations are in areas that have been surveyed for cultural resources. No known sites are located within the boundaries of any of the three proposed training locations or within 500 m of them. All work will be completed before the end of December 2013.

All previously recorded archaeological sites or historic properties fall outside the proposed project area. Additionally, transportation to and from the proposed project sites will be restricted to existing roads, causing minimal ground disturbance outside the sandboxes; thus, the proposed project would have no effect on identified cultural resources.

Figure 3. Map showing OP7 proposed engineer digging area or "sandbox" APE

Figure 4. Map showing Bear Drop Zone proposed engineer digging area or "sandbox" APE

4.3 Maneuver Corridor Test Site

United States Army Garrison Alaska proposes to establish a Maneuver Corridor test site on lands located approximately 11 km south of Delta Junction and 13 km west of the Richardson Highway at Ft. Wainwright's Donnelly Training Area (Figures 2). The purpose of the site will be to develop and test maneuvers to be used in response to various landforms. The information obtained from these tests will be used to help develop tree spacing in ranges and military training areas where vehicles may operate. The primary vehicle considered in these tests will be the Stryker, which is a light armored, wheeled vehicle approximately nine feet wide. Removal of trees via a combination of hand thinning and hydro-axing of the area will be employed to create the test site. Construction is scheduled between late December 2009 and December 2013. The total size of the project area is 93 acres. Access trail improvement will be made from 33 Mile Loop Rd. to Maneuver Corridor by hardening the existing trail.

A Section 106 (NHPA) review of the current project area was conducted in July 2009. The survey crew walked parallel transects approximately every 20 m across the project areas. No cultural material was observed. All previously recorded archaeological sites or historic properties fall outside the proposed project area, thus the proposed project would have no effect on identified cultural resources.

4.4 Theater Specific Village Black Rapids Training Area

USAG FWA has proposed the creation of a Theater Specific Village (TSV) at the Northwest Training Center (NWTC) located on Ft. Wainwright's Black Rapids Training Area. The TSV will simulate a high altitude village designed for small arms training and will consist of 16 shooting houses with large gravel pads. Access roads, berms, targets and gates will also be added.

Two areas have been surveyed as possible locations for the TSV. Option A is north of Falls Creek, roughly 1000 m west of XMH-318. Option B is roughly 1200 m southwest of XMH-317 and due west of the AT&T/Alascom tower XMH-392 (Figure Z).

Five historic and prehistoric sites have been recorded in the vicinity of the proposed project areas. To the south of Falls Creek, two prehistoric sites were recorded by Bacon and Holmes (1980: 95, 41-45): **XMH-00317** is a sparse lithic scatter, comprised of ten chert waste flakes observed down slope of a small outcrop; at **XMH-00318**, a retouched flake and single waste flake were observed on a steep slope. Neither of these sites has been evaluated for extent of subsurface material or eligibility for listing in the NRHP. Both fall outside of the proposed project's APE and would not be impacted by the proposed project.

Site **XMH-00392**, near the crossing of Camp Terry Creek and the Richardson Highway, is the location of a Black Rapids White Alice Communication System (WACS). The Black Rapids WACS was opened in 1960, providing TD-2 microwave communication between Donnelly Dome WACS (19 miles north) and McCallum WACS (20 miles south). Facilities at the repeater station included a 1560 square foot radio relay building, a 722 foot chain link security fence, 2500 gallons of underground storage, and a TD-2 tower. The station was declared excess in 1979, and was purchased by AT&T/Alascom in 1984. As of 1988, the site was being maintained, was in use, and was determined eligible for listing in the National Register (Reynolds 1988: 60).

Site **XMH-00221**, located north of Camp Terry Creek, is comprised of a thin scatter of flakes collected from the surface at the time of survey (Cook 1976: 4). Exploratory testing failed to recover additional material, and subsequently the site was determined ineligible for listing in the National Register (Cook 1976: 4).

The fifth site recorded near the project area is the Black Rapids Roadhouse/Hunting Lodge, **XMH-00223**. The original roadhouse was a 2 story log building. Single story log additions were constructed on the north, south and east sides, creating an L-shaped configuration. Both the north and south additions have metal covered gabled roofs, running perpendicular to the original structure. The east addition contains three additional rooms. The Black Rapids roadhouse is one of a few remaining roadhouses that operated along the Valdez-Fairbanks trail, (now the Richardson Highway) between 1904 and 1923. Originally there were more than 30 roadhouses, which were linked by one day's travel (Phillips 1984: 56; Smith 1974: 23, 94-95). This site was determined eligible for listing in the National Register of Historic Places, and listed in February 2001. The Black Rapids Roadhouse falls outside of the proposed project's APE.

Section 106 (NHPA) Inventory

In June of 2009, an archaeological survey crew comprised of five CEMML archaeologists conducted a pedestrian survey of the potential project areas. The projects' APEs encompass areas larger than the anticipated construction footprint in order to ensure coverage of areas that may incur secondary impacts during construction or use. No cultural material was observed in

either APE. All previously recorded archaeological sites or historic properties fall outside the proposed project areas and thus the proposed project will have no effect on identified cultural resources. All work will be completed no later than December 2012.

4.5 Alternative Energy Black Rapids Training Area

USAG FWA has proposed the installation of alternative energy (100 KW wind generator and 4,000 SF of solar panels) at the Northwest Training Center (NWTC).

Two potential sites have also been identified for the alternative energy power generation facility. Site 1 (the primary location) is between the pipeline and the Richardson Highway, and upslope slightly northwest of the ski lift. Site 2 (the secondary location) is east of the pipeline, immediately north of Camp Terry Creek, and south of the on-site trailer pad.

Wind turbine construction will happen in two stages. First small wind meter towers will be erected from which data on wind speed, direction and duration will be collected. If the site meets guidelines for wind generated power, several wind turbines will replace the wind meters.

In June on 2009, an archaeological survey crew comprised of five CEMML archaeologists conducted a pedestrian survey of the proposed projects project areas within the Black Rapids Training Area. The projects' APEs encompass areas larger than the anticipated construction footprint in order to ensure coverage of areas that may incur secondary impacts during construction or use. No cultural material was observed. All previously recorded archaeological sites or historic properties fall outside the proposed project area and thus the proposed project will have no effect on identified cultural resources. All work will be completed no later than December 2012.

5.0 Survey and Archaeological District at DTA 2009

During the summer of 2009, one archaeological survey crew (comprised of four archaeologists) employed by CEMML conducted Phase I pedestrian surveys for the previously listed projects. This crew surveyed 1,289 acres on DTA East and BRTA during the 2009 summer field season, and no new archaeological sites were identified (Figures 7 – 12).

To date, 435 prehistoric sites have been identified within the boundaries of the DTA; and this number is certain to increase with future survey work. These sites generally consist of small surface or shallowly buried lithic scatters, reflective of temporary task-related activities or short-term residential camps.

In 2009, USAG FWA has proposed to evaluate the prehistoric archaeological sites located in the DTA to determine if they constitute an archaeological district. In evaluating these sites as a district, USAG FWA aims is to develop consistent criteria that establish which sites are contributing elements in the larger context of Interior Alaskan prehistory. USAG FWA hopes that this will ultimately streamline project review and allow for management of these cultural resources in the most effective and efficient manner possible.

6.0 Obsidian

Obsidian is a nonlocal material type on the DTA. Previous work conducted by John Cook (1995) revealed that the obsidian used to make artifacts found on the DTA came from a great distance (280 km) and this fact may reveal prehistoric trade routes or patterns of acquisition.

During the fall and winter of 2007, USGA FWA submitted thirty obsidian samples from seventeen archaeological sites located on the DTA along with two samples from previous unpublished excavations in the DTA by John Cook. Fourteen of the samples submitted came from the Batza Tena obsidian source on the Koyukuk River located more than 450 km from the DTA. Seven samples came from the Wiki Peak obsidian source in the Wrangell Mountains located more than 280 km from the DTA. Two samples came from Mt. Edziza obsidian source in Canada, located more than 1000 km from the DTA. The other nine samples came from an unknown source (Slobodina and Speakman 2008).

In 2009, USAG FWA submitted another 143 obsidian samples from six separate archaeological sites located on the DTA: 8 samples from XMH-00278, 55 samples from XMH-00876, 18 samples from XMH-00910, 40 samples from XMH-00915, 8 samples from XMH-00920, and 14 samples from XMH-00925. These samples will be analyzed by the University of Alaska Museum and the Smithsonian Institution's Museum Conservation Institute using X-ray fluorescence (XRF) spectrometer and/or laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS).

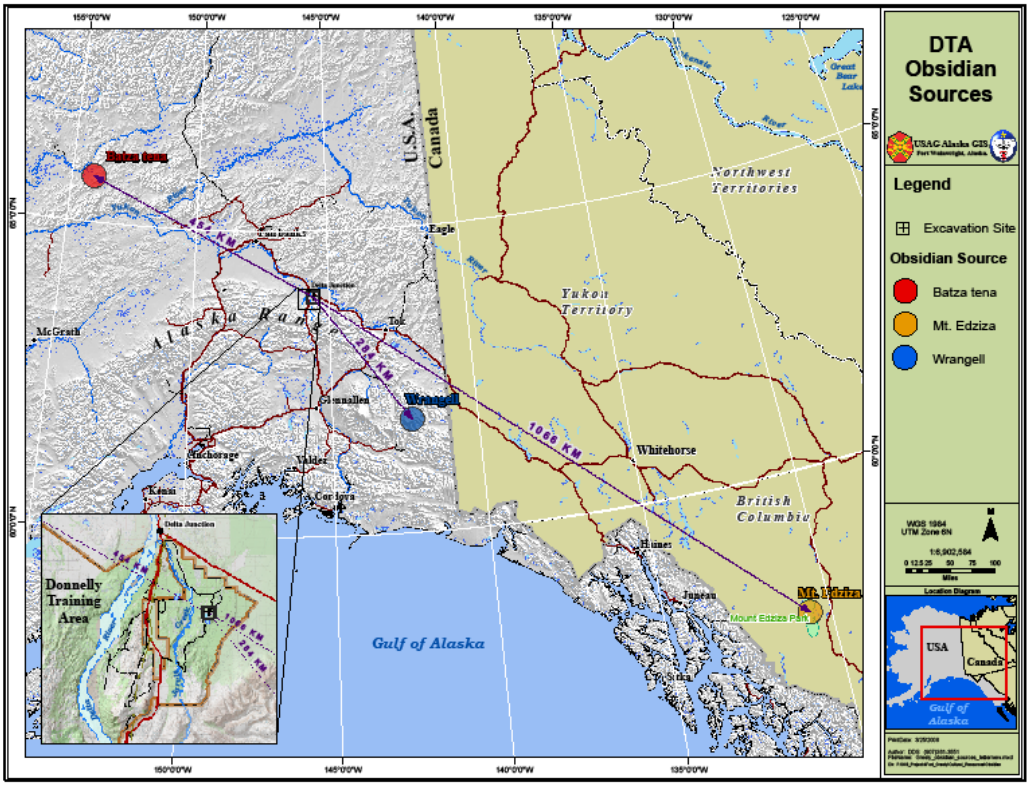

Figure 13. Location of Obsidian sources in Alaska and Canada Represented on the DTA.

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