Annual Report:
Archaeological Survey and Evaluation
Fort Wainwright and Fort Richardson, Alaska 2008

August 2009

Annual Report:
Archaeological Survey and Evaluation
Fort Wainwright and Fort Richardson, Alaska 2008

by

Edmund P. Gaines

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

Lisa Graham
Conservation Branch
Directorate of Public Works
U.S. Army Garrison Fort Wainwright
Fort Wainwright, AK

2009

ACKNOWLEDGEMENTS

Several field personnel contributed valuable expertise and labor to the 2008 field season. The results of the survey and evaluation efforts are a testament to their work ethic and professionalism. We graciously thank:

Dave Cory
Dan Martinez
Eric Gingerich
Kate Yeske

Special thanks are also due to Chris Houlette for his assistance with elemental analysis of the obsidian artifacts detailed in this report.

List of Acronyms

AHRS – Alaska Heritage Resource Survey
ANC – Anchorage
APE – Area of Potential Effect
ARPA – Archaeological Resources Protection Act
ATV – All Terrain Vehicles
BP – Years before Present
CEMML – Center for Environmental Management of Military Lands
cm BS – Centimeters below Surface
CMT – Culturally Modified Tree
DEM – Digital Elevation Model
DTA – Donnelly Training Area
FAI – Fairbanks
FP – Firing Point
FRA – Fort Richardson
FS – Field Sample
FWA – Fort Wainwright
ICRMP – Integrated Cultural Resources Management Plan
ITAM – Integrated Training AreaF Management
LA-ICP-MS – laser ablation inductively coupled plasma mass spectrometry
MASL – Meters above Sea Level
MOUT –Military Operations on Urban Terrain
MRE – Meal-Ready-to-Eat
NHPA – National Historic Preservation Act
NRHP – National Register of Historic Places
SFAC – Soldier Family Assistance Center
SHPO – State Historic Preservation Officer
TARP – Training Area Restoration Plan
TFTA – Tanana Flats Training Area
UAC – Urban Assault Course
USAG – U. S. Army Garrison
USARAK – U. S. Army Alaska
USARAL – U. S. Army Alaska (historic)
USGS – U. S. Geological Survey
UTM – Universal Transverse Mercator
UXO – Unexploded Ordinance
WT – Warrior in Transition
XRF – X-ray fluorescence
XBD – Big Delta
XMH – Mt. Hayes
YTA – Yukon Training Area

Table of Contents

1.0 INTRODUCTION 1

2.0 FORT RICHARDSON (FRA) 2

2.1 Training Area Restoration Plan (TARP) 8
2.2 Arctic Warrior Maneuver Corridor 15
2.3 Warrior in Transition Unit 20
2.4 Urban Assault Course Upgrades 26

3.0 FORT WAINWRIGHT (FWA) 30

3.1 Yukon Training Area (YTA) 34
3.2 Firing Point Hippie Upgrades, YTA 34
3.3 Beaver Creek Road Upgrades, YTA 41
3.4 Tanana Flats Training Area (TFTA) 49
3.5 Wood River Survey, TFTA 50
3.6 Clear Creek Butte, TFTA 55
3.7 Salmon Loaf Butte, TFTA 64
3.8 Donnelly Training Area (DTA) 73
3.9 Maneuverability and Mobility Enhancement Tail Network Upgrade, DTA 75

APPENDIX 1: Obsidian Analysis 126

Table of Figures

Figure 1. Location of U.S. Army lands in Alaska 1
Figure 2. Location of Fort Richardson 2
Figure 3. TARP Area of Potential Effect (APE) 9
Figure 4. Typical vegetation in TARP APE (view to north) 11
Figure 5. Bark stripped birch tree (view to west) 12
Figure 6. Hasty bunker (view to northeast) 13
Figure 7. Maneuver Corridor Area of Potential Effect (APE) 15
Figure 8. Typical vegetation in Maneuver Corridor APE (view to west) 16
Figure 9. Rectangular pit (hasty fighting position; tape is extended 1 m) 17
Figure 10. U-shaped trench (view to northeast) 18
Figure 11. Circular depression (view to north) 18
Figure 12. Warrior in Transition (WT) Area of Potential Effect (APE) 21
Figure 13. Typical vegetation in WT APE (view to east) 22
Figure 14. Refrigerator (view to southeast) 23

Figure 15. Automobile #1 (view to west) 24
Figure 16. Automobile #2 (view to north) 24
Figure 17. Urban Assault Course location 27
Figure 18. UAC overview (view to southeast) 28
Figure 19. Location of Firing Point Hippie and APE 35
Figure 20. Firing Point Hippie APE 36
Figure 21. Existing Firing Point Hippie (view to north) 38
Figure 22. Typical vegetation in Bivouac Area (view to west) 38
Figure 23. Hunting stand in Bivouac Area (view to south) 39
Figure 24. Modern slab-lined fire pit in existing firing point (view to north) 40
Figure 25. Test pit stratigraphy (scale is extended 1 m) 40
Figure 26. Location of Beaver Creek Road APE 42
Figure 27. AHRS sites in vicinity of Beaver Creek Road 44
Figure 28. Beaver Creek Road survey findings 44
Figure 29. Overview of Beaver Creek Road APE (view to east) 45
Figure 30. Bark stripped birch tree 46
Figure 31. 55 gallon drum 46
Figure 32. Typical test pit stratigraphy 47
Figure 33. Wood River, Buttes, and 2008 survey area 50
Figure 34. FAI-01356 retouched blade-like flake 52
Figure 35. TFTA, Clear Creek Butte, and Salmon Loaf Butte 55
Figure 36. FAI-00197 fragmentary obsidian projectile point 57
Figure 37. FAI-00197 side-notched projectile point 57
Figure 38. FAI-00197 biface 58
Figure 39. FAI-00197 surface microblade cores (A=FS 5; B=FS 6; C=FS 8) 58
Figure 41. FAI-00197 (view to east) 63
Figure 42. FAI-00197 stratigraphy 63
Figure 43. FAI-01357 biface 65
Figure 45. Site FAI-01357 (view to east) 68
Figure 46. FAI-01357 Stratigraphy 68
Figure 47. Site FAI-10888 (view to west) 70
Figure 48. Site FAI-01189 (view to east) 71
Figure 49. Talus on southwest slope of the butte (view to north) 72
Figure 50. Donnelly Training Area (DTA) 74
Figure 51. Location of DTA Tail Network Upgrade project area 75
Figure 52. XMH-00274 overview (view to northwest) 78
Figure 53. XMH-01360 overview (view to east) 79
Figure 54. XMH-1360 scraper 79
Figure 55. XMH-01361 overview (view to south) 80
Figure 56. XMH-01362 overview (view to north) 81
Figure 57. XMH-01363 overview (view to west) 82
Figure 58. XMH-01364 overview (view to southwest) 83
Figure 59. XMH-01365 overview (view to east) 84
Figure 60. XMH-01365 Fragmentary biface 85
Figure 61. XMH-01366 overview (view to north) 86
Figure 62. XMH-01367 overview (view to south) 87

Figure 63. XMH-10367 side-notched projectile point 87
Figure 64. XMH-01368 overview (view to east) 88
Figure 65. XMH-01368 fragmentary scraper 89
Figure 66. XMH-01369 overview (view to west) 90
Figure 67. XMH-01369 fragmentary scraper 90
Figure 68. XMH-01370 overview (view to north) 91
Figure 69. XMH-01371 overview (view to north) 92
Figure 70. XMH-01372 overview (view to east) 93
Figure 71. XMH-01373 overview (view to west) 95
Figure 72. XMH-01373 artifacts 95
Figure 73. XMH-01374 overview (view to north) 96
Figure 74. XMH-01375 overview (view to south) 97
Figure 75. XMH01375 endscraper 98
Figure 76. XMH-01376 overview (view to east) 99
Figure 77. XMH-01377 overview (view to south) 101
Figure 78. XMH-01377 microblades (from left to right: FS5, FS4, FS3, FS2, FS1) 101
Figure 79. XMH-01377 biface (A) and scraper (B) 102
Figure 80. XMH-01378 overview (view to west) 103
Figure 81. XMH-01379 overview (view to west) 104
Figure 82. XMH-01380 overview (view to east) 105
Figure 83. XMH-01381 overview (view to east) 106
Figure 84. XMH-01381 biface fragments 106
Figure 85. XMH-01382 overview (view to south) 108
Figure 86. XMH-01383 broken projectile point preform 109
Figure 87. XMH-01383 overview (view to east) 109
Figure 88. XMH-01384 overview (view to north) 111

List of Tables

Table 1. FAI-00197 surface microblade core attributes 60
Table 2. FAI-00197 surface microblade attributes 60
Table 3. FAI-00197 subsurface lithic debitage 61
Table 4. FAI-00197 subsurface microblade attributes 62
Table 5. FAI-01357 test pit one cultural material 67
Table 6. XMH-01377 microblade attributes 100
Table 7. Characterization of obsidian artifacts from FAI-00197, FAI-01885, FAI-00194, FAI-01356, and XMH-01377 127

1.0 INTRODUCTION

In 2008, the U.S. Army Garrison Fort Wainwright (USAG FWA) and U.S. Army Garrison Fort Richardson (USAG FRA) initiated several projects that triggered archaeological and cultural resource analyses and surveys of proposed project areas. This report details each undertaking for which archaeological fieldwork was completed at Fort Wainwright and Fort Richardson. One range project conducted at the Donnelly Training Area (DTA; within the boundaries of former Fort Greely) is reported here; however, the majority of the fieldwork conducted at DTA is being prepared in a separate annual report (see Robertson et al. 2009).

Survey and subsurface testing was conducted following procedures defined in USAG FWA's and USAG FRA's Integrated Cultural Resources Management Plan (ICRMP) (CEMML 2001). Where archaeological sites were identified within a project's area of potential effect (APE), evaluative testing was conducted to determine eligibility for listing in the National Register of Historic Places, based on National Register Criteria detailed in 36 CFR 60.4, 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 Colorado State University, Center for Environmental Management of Military Lands (CEMML), conducted surveys of areas potentially impacted (both directly and indirectly) by proposed undertakings. One crew, comprised of three to five archaeologists, conducted work at Fort Wainwright's and Fort Richardson's training areas.

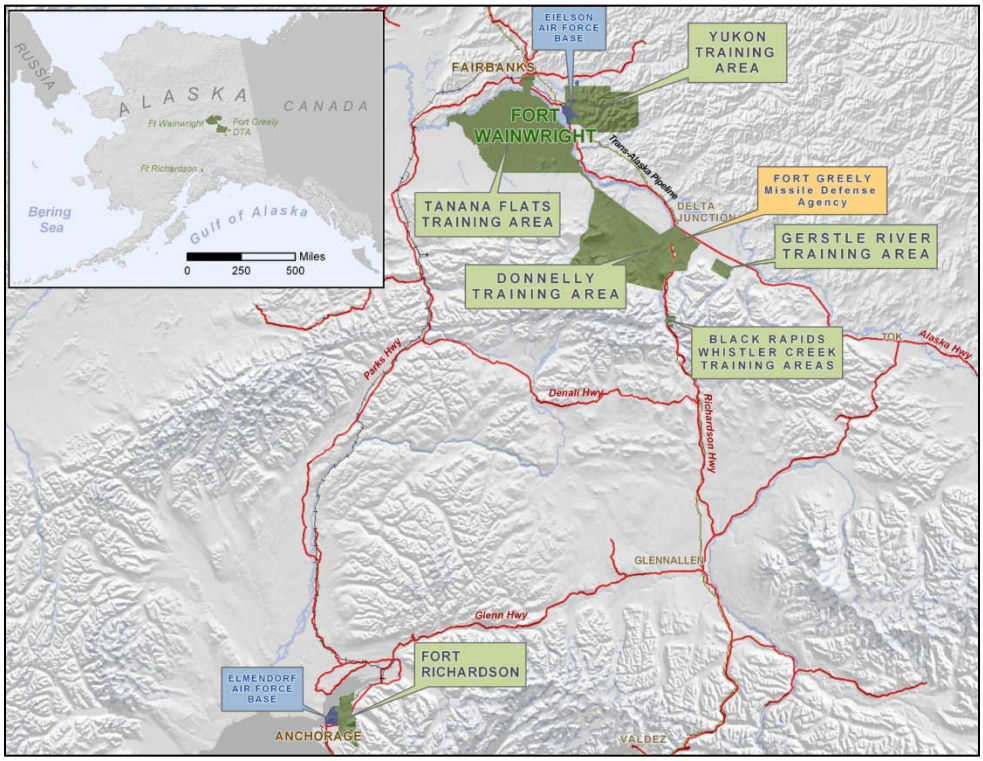

Figure 1. Location of U.S. Army lands in Alaska

2.0 FORT RICHARDSON (FRA)

Four range projects were the primary focus of archaeological work at Fort Richardson in 2008. These included: (1) Training Area Restoration Plan (TARP) rehabilitation projects in Training Area 1C, located in the northern section of Fort Richardson; (2) Arctic Warrior Maneuver Corridor construction in Training Area 1A, in the northern portion of Fort Richardson; (3) Construction of Warrior in Transition (WT) support complex in the central portion of Fort Richardson adjacent to the cantonment area; and (4) Urban Assault Course (UAC) upgrades in Training Area 12A, in the southern portion of Fort Richardson. No historic properties will be affected by any of the proposed projects.

Setting

Fort Richardson consists of 61,294 acres located to the north and east of the city of Anchorage (Figure 2). The climate is transitional between maritime (warm winters, high precipitation, and frequent high winds) and interior-continental (cold winters, low precipitation, and generally light winds). Based on long-term climatic records (1952–2000) for Anchorage (elevation 34 m), the mean annual temperature is 35.9º F, with mean monthly temperatures ranging from 14.7º F in January to 59.5º C in July. Daily extremes over the period of record ranged from –34.6º F to 84.2º F. The thawing season lasts approximately 200 days beginning in early April and ending in late October. Mean annual precipitation is 15.7 in., with mean monthly precipitation ranging from .5 in. in April to 3 in. in August. The highest daily precipitation ever recorded was 3 inches. About half the precipitation falls as snow (Jorgensen et al. 2003).

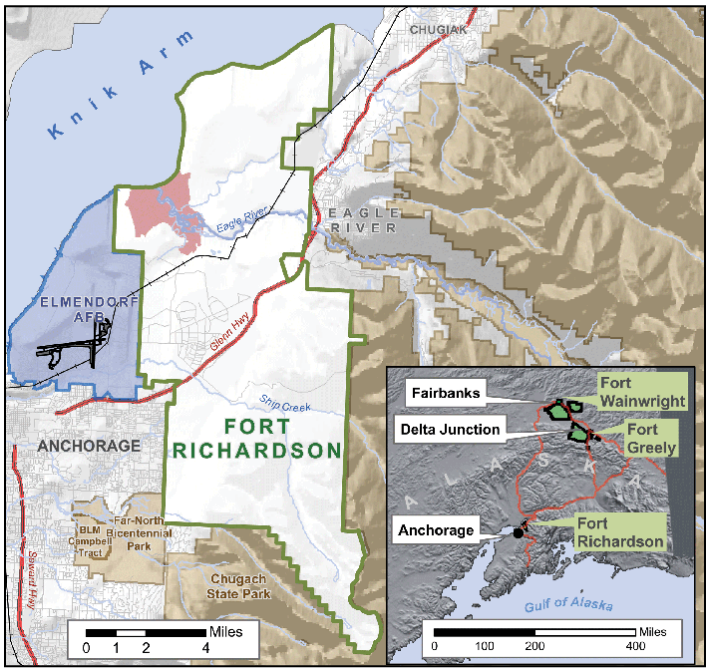

Figure 2. Location of Fort Richardson

Fort Richardson's training lands fall into two main physiographic divisions. The eastern 22,048 acres are in the Chugach Mountains of the Kenai-Chugach Mountain section of the Pacific Border Ranges province (Wahrhaftig 1965). This steep, rugged terrain has mountaintops that range in elevation from 900 to 1615 masl (meters above sea level) at Tanaina Peak. These were formed by mountain-building processes resulting from the subduction of the Pacific Plate under the North American plate, and are primarily composed of Lower Cretaceous and Upper Jurassic flysch, greenstone, limestone, chert, granodiorite, glaucophane-bearing greenschist, and layered gabbro and serpentine (Jorgensen et al. 2003). Hill slopes are dominated by bedrock exposures and colluvial deposits. This area has shallow, poorly developed rocky soils low in primary nutrients (NRCS 2000). The peaks and higher slopes are characterized as barrens (<5% vegetation), and alpine shrub tundra. Lower slopes have vegetation that ranges from thick stands of alder (*Alnus spp.*) and willow (*Salix spp.*), to poplar (*Populus spp.)*, birch (*Betula spp.*) and spruce (*Picea spp.*) forests (Jorgensen et al. 2003).

Fort Richardson's western 39,246 acres fall within the Cook Inlet-Susitna lowland section of the Coastal Trough physiographic province (Wahrhaftig 1965). Also known as the Anchorage lowland, this terrain consists of alluvial fans, glacial outwash plains, moraine complexes and a subdued kame-and-kettle topography. Surficial deposits consist of Holocene-age aeolian silt (loess) and alluvial sands, silts and clays, underlain by late Pleistocene, poorly sorted glacial gravels, and alluvial well-sorted sands and gravels. Soils are characterized as well-drained silt loams on the higher moraines and hills, and poorly drained silt loams, mucky silt loams, and peats in lowland areas and depressions (NRCS 2000). The Elmendorf moraine, a hummocky, long series of ridges running east-west across Fort Richardson just north of the cantonment area, is the dominant topographic feature. Elevations of the moraine rise to more than 100 m, especially in the west. North of the Elmendorf moraine is a complex of moraine and glacial alluvium deposits that form a series of irregular hills and shallow depressions; however, these deposits are more subdued in topography than the Elmendorf moraine. Vegetation in the western portion of the fort consists of birch (*Betula spp.*), spruce (*Picea spp.*), aspen (*Populus tremuloides*) and alder (*Alnus spp.*) forests. Understory vegetation is moderate to dense, with various grasses and herbs, including fireweed (*Epilobium spp.*), lupine (*Lupinus spp.*), devil's club (*Oplopanax horridus*), high-bush cranberry (*Viburnum spp.*), and cow parsnip (*Heracleum maximum*).

To the west, Fort Richardson borders the Knik Arm of the Cook Inlet. The banks of the inlet are constantly eroding by wind, waves and tidal currents, or by the occasional earthquake, forming steep bluffs that range in height from 10-65 m. Rates of erosion have been calculated as high as .2-.4 horizontal meters/year (Dilley 1996). Knik Arm is characterized as having tidal ranges of up to 11 m. Knik Arm beaches on Fort Richardson are narrow and range from very muddy to gravelly. All of the streams, lakes and ponds on the Post drain into Knik Arm.

Prehistoric Background

Although glacial studies indicate that Cook Inlet may have been habitable by about 11,000 BP (Reger and Pinney 1996), few archaeological sites dating earlier than the late prehistoric period have been identified within the Cook Inlet region. The earliest and arguably the most significant site in the Cook Inlet area is Beluga Point, located approximately 10 miles to the southeast of

Fort Richardson, near the entrance to Turnagain Arm. Though largely lacking datable material beyond 4000 BP, artifact assemblages at Beluga Point indicate consistent use of the location throughout the Holocene.

The earliest component at Beluga Point is the undated BPN-I core and blade component, estimated at 8000 to 10,000 BP, based on similarities with dated material found elsewhere in Alaska (Reger 1977, 1981). The presence of this assemblage, which could be designated as a regional variant of the American Paleoarctic Tradition (e.g. Anderson 1970a, 1970b; Dumond 1977), makes Beluga Point the lone early Holocene site in the Cook Inlet region identified to date. The only other site in the region that exhibits a similar assemblage is the early middle Holocene Long Lake site in the Matanuska Valley dating to approximately 6600 BP (Reger and Bacon 1996). Despite the coastal location, these early microblade assemblages have been interpreted as reflecting the activities of terrestrial hunter-gatherers (Workman 1978).

The middle Holocene (6000 to 4000 BP) in Cook Inlet is represented by components BPN-II and BPS-II at Beluga Point. Though also undated, the presence of microblades and ground slate indicate an association with the maritime-adapted Ocean Bay I and II assemblages in the Kodiak archipelago, the Takli Alder and Birch assemblages of Shelikof Strait (Reger 1981:185-186), and assemblages from the Alaska Peninsula that appear to be associated with the Arctic Small Tool tradition (Dumond 1977; Henn 1978).

Sites dating between 3000 and 1000 BP in the Cook Inlet region suggest the development and/or spread of Pacific Eskimo culture, seen in Norton affinities of a Beluga Point component dating prior to 1500 BP. It has been suggested that this period saw the spread of Norton peoples and technology from the Bristol Bay area (Reger 1981). Norton influence in Cook Inlet is overshadowed in this period by a number of sites exhibiting strong similarities to Kachemak tradition sites to the south. Kachemak components differ from those of the Kenai Peninsula and Kodiak in that they exhibit a toolkit that is apparently more adapted to terrestrial hunting and riverine exploitation than maritime subsistence. Components at the Knik Arm sites of Fish Creek (Dumond & Mace 1968) and Moose River (Dixon 1980:32-34; Reger & Boraas 1991) are representative of this adaptation, later defined as Riverine Kachemak by Reger and Boraas (1996), dating to between 2000 and 1000 BP on the Kenai Peninsula.

By far the most visible prehistoric site type in the Cook Inlet region is that of the late prehistoric Athabaskan Tradition. These sites, often characterized by rectangular house depressions, cache pits, few diagnostic artifacts, and an abundance of fire-cracked rock, are presumably associated with the Dena'ina Athabaskans who are thought to have replaced local Eskimo groups in the archaeological record by perhaps 750 or 1000 BP (McMahan et al. 1991). Linguistic evidence and Dena'ina oral history suggest that Athabaskan groups from the Copper River drainage and the upper Stony and Mulchatna Rivers began moving into upper Cook Inlet between 1,500 and 2,000 years ago (Kari 1988).

Historic Background

Fort Richardson falls within the traditional lands of the Dena'ina Athabaskan tribes of Upper Cook Inlet. In general, the Dena'ina traditionally pursued a semi-permanent lifeway, spending winters in permanent settlements and dispersing in the summer months with the onset of summer fish runs. Seasonal camps at favorable fishing locations were established along river banks,

coastal edges and lake shores, and were reused annually. Once salmon runs had ended, groups would often focus on travel into the mountains to hunt caribou and mountain sheep; such trips to the Interior would also be a time for trading with other groups encountered during these seasonal hunts. Moose, bear, mountain goats and Dall sheep were often hunted year-round in areas outlying winter village settlements (Townsend 1981: 626-627). Specifically, settlements at Knik Arm have been well-summarized by Fall (1987):

> In the nineteenth century this group included those Tanaina living along the shores of Knik Arm and the Matanuska and Knik rivers. They used the present day Anchorage area for salmon fishing and the Chugach and Talkeetna Mountains for hunting. In 1978-9, the only Tanaina village in this area was Eklutna, but in the past this was a highly populated area (Osgood 1937: 18) and many former village sites have been recorded (Kari 1988; Kari & Kari 1982).

The Anchorage area held several village sites prior to the arrival of Russian and Euro-American settlers; Anchorage itself was called *Qatuk'e'usht* (also *Xa'tikiuet*) by the people of Kenai, and once supported a Dena'ina village (Yaw Davis 1994). The mouth of Ship Creek historically supported a significant salmon run, and was the focus of fish camps and seasonal subsistence fishing, prior to the advent of canneries and commercial fishing. Of special significance is the modern Athabaskan village of Eklutna, located to the north of Fort Richardson on the Knik Arm The introduction of Russian and Euro-American settlers into the region began with the famous voyages of Bering and Cook; in 1786, St. George became the first permanent Russian settlement established at Cook Inlet, at the mouth of the Kasilof River, Kenai Peninsula.

In 1778 Captain James Cook, sailing for the Northwest Passage, encountered the Dena'ina people on his exploration of the inlet that now bears his name. This event marked the first recorded contact of the native peoples of the region with Europeans. However, earlier contact was likely made by Russian fur traders who began operating in the Alaskan territory following the turn of the 18th Century. In 1799 all Russian fur trading companies operating in the territory were consolidated into the Russian-American Company. For the next 68 years, the company governed the Alaskan territory from Sitka (in southeastern Alaska) under the colonial authority of the Tsar of Russia.

On October 18, 1867 control of the Alaskan territory was officially transferred from Russia to the United States, which had purchased the land for $7.2 million. This event ushered in a period of more intensive Euroamerican impact on the region.

During the years immediately following the purchase, United States control resembled Russian, with the Alaska Commercial Company replacing the Russian-American Company. However, the pace of exploration and commercial development accelerated in 1884 with the organization of Alaska into a civil and judicial district (Bacon et al. 1986). Gold rushes of the late 1800's permanently changed the territory's demography. The first gold rush occurred in 1880 at what is now Juneau. However, it was rushes in the Interior that had the greatest impact on the Cook Inlet region. During the Circle City (1893) and Klondike (1896) gold rushes, the Cook Inlet area, and particularly the Dena'ina town of Knik, served as a supply center for miners and goods headed for the Interior. Many newcomers stayed in the territory and enhanced both the commercial and political visibility of the territory (Bacon et al. 1986).

In 1912, a territorial government was established in Alaska with development continuing in fishing, mining, and the timber industry. The Alaska Railroad, linking Seward, Anchorage and Fairbanks, was completed in 1923. During the Depression, public works projects sponsored by the federal government resulted in the construction of large and small facilities throughout Alaska, including schools, bridges, trails, harbors, and water systems (Bacon et al. 1986).

Fort Richardson was established by Presidential Executive Order in 1939 as Elmendorf Field. The site north of Anchorage was chosen because of relatively favorable weather patterns and access to two important transportation assets: the Alaska railroad and Cook Inlet. The name Fort Richardson was adopted roughly a year later in memory of Brigadier General Wilds P. Richardson, a Texas engineer who surveyed and supervised construction of Alaska's first highway and served as a commander of the American Expeditionary Force, North Russia (Bacon et al. 1986).

During World War II, Fort Richardson was tasked with defending Alaska from invasion and coordinating the Alaskan war effort. Before the outbreak of World War II, military strength in Alaska was less than 3,000; it soon grew to 7,800 troops stationed on Fort Richardson alone, including the 4th Infantry, 81st Field Artillery, and 75th Coast Artillery (antiaircraft). As the war progressed, Fort Richardson's mission expanded significantly to become the logistics base for numerous Army garrisons and the Air Corps.

During the Cold War Fort Richardson primarily served as a training and administrative support role for Army forces in Alaska. In 1947, Fort Richardson became headquarters for the newly established U.S. Army Alaska (USARAL). USARAL was superseded by the 172nd Infantry Brigade (Alaska) in 1974 and finally by the 6th Infantry Division (Light) in 1986. Following the Cold War, the 6th Infantry Division was deactivated and Army forces were reorganized under U.S. Army Alaska.

Fort Richardson Cultural Resources

Previous archaeological work at Fort Richardson includes at least eight projects since the late 1970s (Hedman et al. 2003; Holmes 1979; Reynolds 1996; Shaw 2000; Steele 1978, 1980; Veltre 1978). Of these surveys, only Steele, Reynolds, and Shaw reported the discovery of archaeological sites. Steele's 1980 work produced 4 sites, (ANC-263, 264, 265, and ANC-268), all of which were historic 20th century cabins. Reynolds (1996) recorded the multi-component (historic and late prehistoric) site ANC-822 near Ship Creek in the vicinity of the Moose Run Driving Range. Shaw (2000) recorded approximately 20 sites, the majority of which were Army related mounds, foxholes, and bunkers. Shaw's work also revealed a single prehistoric site, ANC-1175, composed of a single lithic flake and a small lithic spall. This discovery is associated with a cleared area located along the edge of the Elmendorf Moraine (Shaw 2000: 97). The work of Shaw, Steele (1978), and Dilley (1996) indicates that moraine features scattered across Fort Richardson represent higher probability locations for discovering prehistoric archaeological sites on Fort Richardson.

In addition to the known archaeological sites on Fort Richardson, there are numerous locations of historical and cultural significance, though the exact locations of many of these features have not been recorded to date. Portions of the Iditarod Historic Trail (ANC-270 and 280) are recorded and potentially exist on Fort Richardson. The Girdwood-Ship Creek Connecting Trail

(ANC-280), descended the Ship Creek valley to the vicinity of Fort Richardson, where it presumably joined the Eagle River-Knik Trail (ANC-270). Though it is likely that ANC-270 lies outside of Fort Richardson lands, a connecting trail from Anchorage to ANC-270 is known to have existed. This connecting trail is recorded as following the Eagle River drainage (presumably from Knik Arm) to Lake Clunie, and on to Birchwood (CEMML 2001:26). This route is likely to have followed Clunie Creek north from Eagle River to Lake Clunie, a route that crosses the northern portion of Fort Richardson.

A number of historic properties are located on or near Army lands in Alaska; many of these properties are historic structures and buildings pre-dating or associated with World War II and Cold War era Army activities (see e.g., Hollinger 2001; Shaw 2000). As found during previous surveys on Fort Richardson (e.g., Shaw 2000), evidence of previous military training activity was prolific throughout the proposed training project areas. Heavy disturbance from trench building, foxholes and unexploded ammunitions (UXO) were found frequently during survey. Although there is a possibility that some of these features may date to training activities undertaken during World War II and the immediate post-war period, none of these features can be clearly assigned to a specific date. Features such as these were referred to as 'Base Ground Defense Sites' in Shaw (2000), and were uniformly determined to be ineligible to the National Register (Shaw 2000: 16-22, 121). As Shaw explained:

> … [such sites are] temporary, theater-of-operations type structures, which are in a deteriorated condition with the construction date being uncertain within about 10 years. Most [military training] sites…have lost physical integrity through neglect after abandonment. The sites have also lost other aspects of integrity regarding design, setting, materials, workmanship, feeling and association over the years by neglect and/or direct actions resulting from operating a military base with changing physical requirements associated with execution of the primary mission. Such actions range among planned demolition of buildings judged to be excess property, inadvertent destruction of structures during new uses of the land such as for gravel pits, construction of new facilities which intrude into and radically change the site setting that existed during WWII, and direct efforts to "clean up" the sites when use stopped' (Shaw 2000: 16).

Features associated with past military training operations, falling under Shaw's 'Base Ground Defense Site' classification (i.e., foxholes and bunkers), were found throughout the proposed project areas reviewed in 2008, and show no clear pattern or relationship as identified in the field. Like Shaw, we find that archaeological evaluations of these features would not contribute significantly to our understanding of military training history in WW II, and do not qualify under National Register criteria D (36 CFR § 60.4). Similar to Shaw's findings, the continued use of these areas for subsequent base activities has heavily impacted the original structural integrity of the features. These features have been determined ineligible for listing in the National Register.

2.1 Training Area Restoration Plan (TARP)

USAG FRA has proposed Training Area Rotation Plan (TARP) land rehabilitation activities at Fort Richardson Training Areas 1-C, 1-B, and 2-A. This project will mitigate training impacts by improving the health of existing vegetation through: (1) mowing, hydroaxing and fertilizing; (2) the establishment of new vegetation in exposed area by hydro-seeding; (3) the closing of unnecessary trails; (4) the improvement of drainage through grading and the installation of water bars and culverts; and (5) the reshaping and restoration of areas damaged by vehicles and equipment. The Area of Potential Effect (APE) of the project consists of 5519 acres located on the following USGS topographic map quadrangles (both of the Seward Meridian) : ANC B-7, T15N, R2W, S1/2 SEC 11, SEC 14, SEC 15, SEC 22, NW1/4 SEC 23, SEC 27, and W1/2 SEC 34; and ANC B-8, NW1/4 SEC 4, NE1/4 SEC 5, SE1/4 SEC 17, S1/2 SEC 16, SEC 21, SE1/4 SEC 20, SEC 28, SEC 29, E1/2 SEC 32, and SEC 33 (Figure 3).

Survey and Field Methods

In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. Sources in USAG FRA Department of Public Works library provided information on previous archaeological work in the area. The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area.

In total, 4909 acres have been surveyed previous to 2008 as part of CEMML's ongoing FRA Cultural Resource Management program. Previously surveyed areas include: 2309 acres in the north-central portion of the project area, and 20 acres in the northwestern area surveyed during 2002 (Hedman et al. 2002: 13-14, 15-17); 2365 acres in the southern area of the APE surveyed during 2003 (Roberston et al. 2003: 8-13); and 215 acres in the northwest portion of the project area surveyed during 2005 (Raymond-Yakoubian 2006: 55-56).

Survey efforts during 2008 included 610 acres in the eastern portion of the TARP project area. On July 24 and 27th, 2008, four archaeologists employed by Colorado State University, CEMML, under the direct supervision of archaeologist, Edmund Gaines, M.A., R.P.A. surveyed the proposed project's APE. Visual survey coverage, consisting of parallel pedestrian transects spaced at 10-20 m, included 100% of the APE. Subsurface testing was conducted in areas of higher site probability including the bluff edge overlooking Knik Arm in the northern portion the project area, several prominent knolls, the vicinity of an unnamed lake in the eastern portion the project area.

Figure 3. TARP Area of Potential Effect (APE)

Previously Identified Cultural Resources

One cultural resource site, ANC-1299, the remains of the Eklutna school fish camp, was relocated by CEMML archaeologists during the 2002 season. The following is taken from Hedman et al. (2002: 15-26):

> "In 1924, the Department of the Interior Bureau of Education built and maintained the Eklutna Industrial (Vocational) School. The school was established to house 26 orphans, whose parents had died in the flu epidemic of 1918. The industrial school was a multi-faceted institution that included a collection of buildings (including a six room hospital, isolation ward, director's cottage, girls' and boys' dormitories, shop, gymnasium, cannery car; meat house, paint house, barn, brooder shed, laying house, waiting station and hog house (Chandonnet 1979: 21). Within two years the school's population doubled, and there was a waiting list for new students. The fish camp site was constructed and used by the school to provide training in traditional fishing methods, while also providing fish for the school's subsistence (Yaw Davis 1994: 53). By 1946 the buildings had been condemned and the school was permanently closed (Chandonnet 1979: 22).
>
> The school fish camp site, as it was referred to in Davis' report (1994), borders two vegetation zones: halophytic and lowland interior forest. The halophytic zone north of the site is composed of barren and vegetated mud flats. The lowland interior zone consists of several lower elevation upland forests, characterized by diverse woodland vegetation. The fish camp site is located within an area where the majority of the forest floor is covered with a dense layer of decaying birch and spruce trees, due to fungal decay and insect damage. The area is overgrown with dense stands of alders (*Alnus sinuata*), devil's club (*Oplopanax horridus*), and blue joint grass (*Calamagrostis sp.*). Cottonwood trees (*Populus trichocarpa*) are sparsely present.
>
> The site is located on the edge of estuarine marshes that form a crescent shaped beach (east-west), which offers limited protection from wind currents. There is a pond formed by wetlands northwest of the smoke house that is most likely the water source described in Yaw Davis' report (1994: 54). The site also rests at the base of a slope rising up to coastal bluffs; erosion of the bluffs does not appear to have damaged the site to date, but increased erosion may soon affect the site's integrity.
>
> The site was re-located by following the narrative description provided in Davis (1994: 52 – 56). The cottonwood trees mentioned in a description of the fish camp site location in the 1994 report are located approximately 80 m east of the smoke house.
>
> The site consists of three primary levels, with the smoke house serving as the main focus. The smoke house is located on the first level, at 10 m above sea level; it is no longer standing and is partially buried with thick ground cover. Vegetative intrusion has occurred, with an alder branch having grown through the east wall of

the smoke house. Three possible fish caches were found southeast of the smoke house. To the southwest of the smoke house is a deep, irregular-shaped square depression bordering the base of the slope, leading up to a flat, open area approximately 11 m above sea level. This open area comprises the third level, and is the only flat area near the site, suggesting a possible occupational use. Well-defined animal and recreational trails linked the entire site area up to the bluff's crest."

Although the Eklutna school fish camp may be eligible for listing in the National Register under Criteria A and D, the site location falls well outside the project area APE.

Findings

The area appears to generally have a low probability for cultural resources. Vegetation in the APE consists of a range of needleleaf, broadleaf, and mixed broadleaf-needleleaf forest with a very thick understory consisting of Devil's club, alder, shrubs, grasses and forbs (Figure 4).

Thick stands of alder grow adjacent to Engineer Expressway. With the exception of a series of low knolls in the central portion of the APE, the area is generally flat with slopes of 0-5%. The northern boundary of the project area is the Knik Arm beach. This area has steep bluffs 7-15 m high, and a sandy gravel beach.

Figure 4. Typical vegetation in TARP APE (view to north)

One bark-stripped paper birch was identified during 2008. The bark on this tree has been completely stripped around the entire circumference, leaving a scar 40 cm high around the entire trunk (Figure 5). Twelve other bark-stripped birch trees were identified within the APE during 2003. Subsurface testing in the vicinity of these trees yielded no evidence of cultural remains.

The area surveyed during 2008 exhibits little evidence of military infantry training activities; however, an improvised structure—likely a hasty bunker—was found in the eastern portion of the APE. The structure has four walls comprised of five stacked paper birch logs (Figure 6). These have been secured to living birch tree trunks, which serve as posts at each of the four corners, with galvanized concertina wire. There is no roof. The structure has a roughly square plan view, with walls 2.5 m in length each. Given the use of modern galvanized concertina wire, and the fresh appearance of the birch log that form its walls, the structure was constructed less than 20 years ago, probably as an improvised structure related to military training exercises.

Figure 5. Bark stripped birch tree (view to west)

Figure 6. Hasty bunker (view to northeast)

Discussion

In total, 13 bark-stripped birch trees have been identified in the APE during 2003 and 2008. Previous cultural resources surveys attributed groupings of bark-stripped birch trees in the vicinity of Otter lake to a Boy Scouts who attended an annual summer at Fort Richardson (Shaw 2000: 94). However, this explanation cannot be confirmed for all of the bark-stripped trees within the boundaries of the proposed project, and it seems likely that some of those identified during survey may be culturally modified trees.

Culturally Modified Trees (CMT) have come under increasing research recently, recognizing the significance of such trees in understanding Native and non-Native forest use (e.g. Mobley and Eldridge 1992; Mobley and Lewis 2009). However, previous research has largely focused on the Pacific Northwest, British Columbia, and Southeast Alaska, where CMT's are predominantly spruce, cedar, and hemlock (e.g Stryd and Eldridge 1993; Mobley and Eldridge 1992; Mobley and Lewis 2009). CMT tree studies have thus been directed on a much different history of use and ecological environment than that of the paper birch trees that predominate the Fort Richardson area. Additionally, paper birch have a life span that rarely exceeds 100 years of age (Viereck et al. 1972), rendering the age and potential significance of bark-stripped trees difficult to determine without further traditional use studies. No vegetation or tree removal activities are planned as part of the proposed project. The two bark-stripped birches are outside the APE, which will be restricted to established trails. Thus, no adverse impacts from the proposed project will affect these trees.

Recommendations

USAG FRA determined that no historic properties will be affected by the proposed undertaking. The Eklutna School fish camp is located well outside of the project APE. In terms of the bark-stripped trees, no trees will not be cut or trimmed as part of the project. The identified structure is a hasty bunker less than 20 years old. Fort Richardson's Integrated Training Lands Management (ITAM) coordinator, Brandon Berta, has been advised of the location of the improvised structure and presence of bark-stripped birch trees within the TARP APE. Activities associated with TARP improvements will avoid the structure and bark-stripped trees.

There is no reason to believe that the proposed project warrants any further fieldwork or consideration under Section 106 of the National Historic Preservation Act (16 USC § 470, as amended 2000), and regulations codified in 36 CFR 800 (as amended 2004). No indications of burials or other human remains were observed within the surveyed area; therefore, barring an unforeseen discovery during the undertaking, there are no further considerations expected under the Native American Graves Protection and Repatriation Act (25 U.S.C.§ 3001 *et seq*.).

2.2 Arctic Warrior Maneuver Corridor

USAG FRA has proposed the construction of the Arctic Warrior Maneuver Corridor within Training Area 1A located on the northern portion of Fort Richardson. This project involves creating a trail complex that will be used for Humvee and Stryker maneuver training. In total, the APE for the project involves 13,335 linear meters of trail that will be cleared 24 feet wide. Trail creation will entail clearing vegetation, removing trees and grinding stumps down to ground level, with no ground-disturbing activities. The APE for the project is contained within roughly 190 acres found on USGS topographic map ANC B-8, T15N, R2W, S1/2 SEC 20, and N1/2 of SEC 29, Seward Meridian, centered roughly at the UTM coordinates of zone 6N 357289E/6806955N (Figure 7).

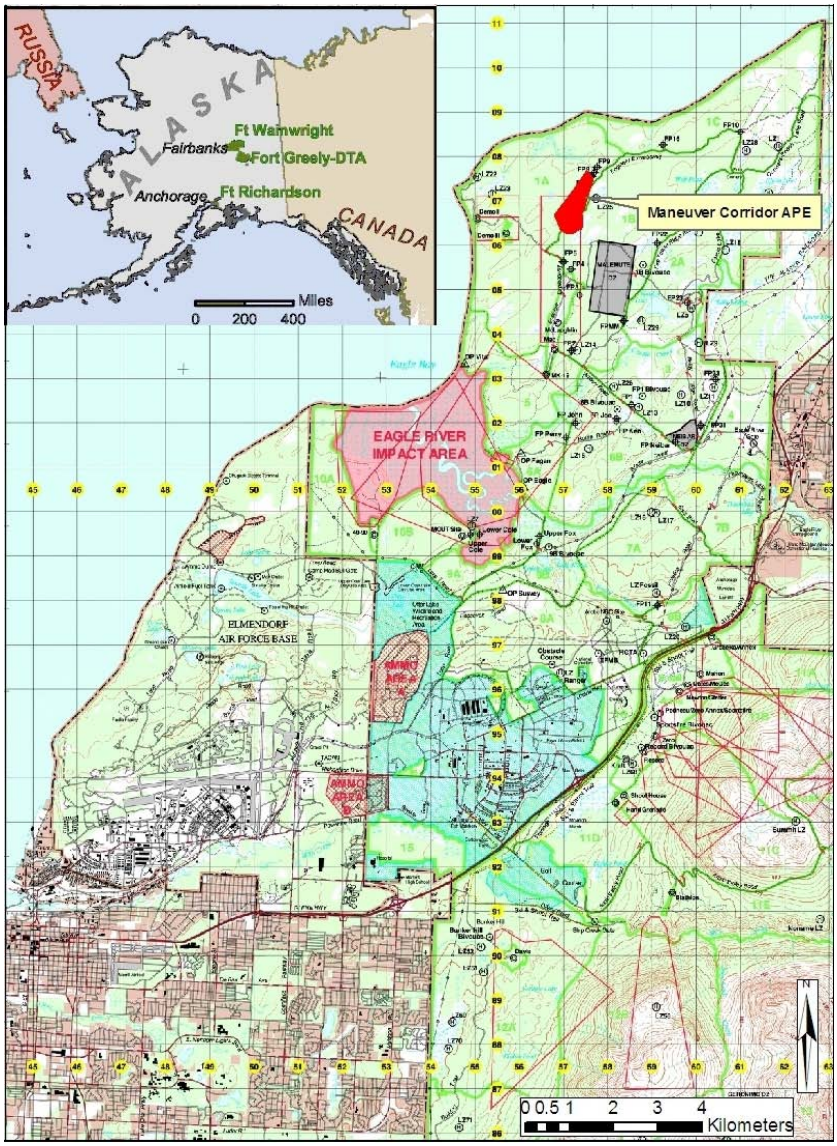

Figure 7. Maneuver Corridor APE

Survey and Field Methods
In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. Sources in USAG FRA Department of Public Works library provided information on previous archaeological work in the area. The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area. Based on this research, it was determined that there are no previously identified cultural resources within 1.5 km of proposed project, and that the area has a low to moderate probability cultural resources.

On July 25, 2008, the proposed project APE was surveyed by four archaeologists employed by Colorado State University, CEMML, under the direct supervision of archaeologist, Edmund Gaines, M.A., R.P.A. Visual survey coverage, consisting of parallel pedestrian transects spaced at 10-20 m, included 100% of the APE. Subsurface testing was conducted in areas of higher site probability including two small, gradual knolls, and several enigmatic depressions encountered in the project area. Subsurface testing consisted of twenty 50 cm x 50 cm test pits screened through ¼" mesh and excavated to the depth of late Pleistocene glacial deposits, which are composed of poorly sorted gravels.

Findings
No cultural resources were identified within the proposed project area APE.

Vegetation in the APE consists of mixed broadleaf-needleleaf forest with a thin understory consisting of grasses and forbs (Figure 8). Thick stands of alder grow adjacent to Engineer Expressway. Much of the northern portion of the APE has been entirely cleared and exhibits an incipient cover of weeds and grasses (Figure 8). The area is generally flat, with slopes of 0-3%. The western portion of the project gradually rises, at a slope of 2-5%, to form a series of low knolls 2-3 m above the surrounding terrain.

Figure 8. Typical vegetation in Maneuver Corridor APE (view to west)

The area appears to generally have a low probability for cultural resources. Field survey revealed that the entire area exhibits extensive evidence of recent military infantry training activities. A cluster of four rectangular pits and one horseshoe-shaped trench were identified in the southern portion of the. The rectangular pits range from 1.5 to 3 m long, 50-60 cm wide and 40-60 cm deep (Figure 9). The shape and character of these pits identify them as hasty fighting positions, commonly referred to as "foxholes", described in U.S. Army Field Manual 7-8 "Infantry Rifle Platoon and Squad." The horseshoe-shaped trench consists of three joined trenches that are 50-60 cm wide, 1 m in length each, and excavated to a depth of 60-80 cm (Figure 10). This is a "horseshoe-shaped machine gun emplacement" also described in U.S. Army Field Manual 7-8 "Infantry Rifle Platoon and Squad." The character of the pits indicates that they are modern, probably less than 10 years old. This notion is supported by modern 5.56 mm and 7.62 mm cartridge casings littering the ground in the vicinity and a Cyalume lightstick that has been attached with orange flagging tape to an adjacent birch tree. Two additional rectangular pits identified as hasty fighting positions were located in the northern portion of the APE.

Figure 9. Rectangular pit (hasty fighting position; tape is extended 1 m)

A cluster of three circular depressions was identified in the central portion of the project area. These range from 1.5 to 2 m in diameter, and 50-75 cm in depth (Figure 11). Comprehensive subsurface testing within the depressions and surrounding areas yielded no evidence that these are cultural in nature. Test pits in the surrounding area revealed stratigraphy consisting of 40-60 cm of aeolian silt (loess) overlying poorly sorted gravels. The basal gravel unit is encountered immediately in the bottoms and walls of all the depressions. No artifacts were encountered either in the test pits or on the surface in the vicinity. Additionally, there is no evidence of organic materials, prepared floors or walls, charcoal or ash staining, or any other indication that these are house or cache pit depressions. There are two possibilities to account for their presence: (1) they are hasty fighting positions associated with infantry training activities; or (2) they are craters resulting from artillery or aerial bombs. The random nature of their spatial distribution and slight berms surrounding the depressions indicates the latter of the two options.

Figure 10. U-shaped trench (view to northeast)

Figure 11. Circular depression (view to north)

Discussion

The nature and character of the hasty fighting positions and horseshoe-shaped machine gun emplacement, as well as recent military debris noted in the vicinity suggest that they are the result of recent training exercises. A small spruce tree growing out of one of the circular

depressions (Figure 11) indicates that it is probably more than 10 years old. Although there is the possibility that some of these features may date to trainings undertaken during World War II and the immediate post-war period, none of these features can be clearly assigned an unequivocal, specific date. Similar features were referred to as "Base Ground Defense Sites" utilized for the protection of Elmendorf Air Force (Army Air Corps) Base during WWII by Shaw (2000), and were uniformly determined to be ineligible for inclusion the National Register of Historic Places (NRHP) (Shaw 2000: 16-22, 121). However, given the location and orientation of the hasty defensive positions and machine gun emplacement encountered in the project area it is difficult to explain how they would have been strategically conducive to defense of Elmendorf Air Force Base. Regardless, archaeological evaluations of these features would not contribute substantially to our understanding of military training history in WWII or later, and do not qualify under National Register Criteria (36 CFR § 60.4).

Summary

USAG FRA determined that no historic properties will be affected by the proposed undertaking. No cultural resources were noted or discovered within the project APE. Thus, there is no reason to believe that the proposed construction of the Arctic Warrior Maneuver Corridor warrants any further fieldwork or consideration under Section 106 of the National Historic Preservation Act (16 USC § 470, as amended 2000), and regulations codified in 36 CFR 800 (as amended 2004). No indications of burials or other human remains were observed within the surveyed area; barring an unforeseen discovery during the undertaking, there will be no further considerations expected under the Native American Graves Protection and Repatriation Act (25 U.S.C.§ 3001 et seq.).

2.3 Warrior in Transition Unit

USAG FRA has proposed construction of a Warrior in Transition (WT) campus on Fort Richardson near Elmendorf's Joint Venture Hospital, Bartlett High School, and new Veteran Administration facility. This project is required to provide permanent facilities to support the healing and reintegration process of soldiers who have been wounded. This undertaking includes the construction of a standard Barracks (48,200 square feet), a standard Battalion Headquarters (8,060 square feet), an additional small Company Headquarters (6,900 square feet), and a small Soldier Family Assistance Center (SFAC) (7,000 square feet). Additional supporting facilities will need to be built as the area is currently undeveloped; these facilities include site work, all necessary utilities, lighting, information systems, parking, sidewalks, roads, curbs and gutters, storm drainage, site accessories, landscaping, furnishings, and other site improvements.

The WT project site is located on Army land, within Fort Richardson's cantonment, bordered by Elmendorf AFB to the west and north and the City of Anchorage property to the south and east. The eastern property line of the WT project site is formed by the City of Anchorage's Bartlett High School property. The northern boundary line is formed by residential property on Elmendorf AFB. The western border is formed by Zuckert Road, an Elmendorf AFB road which provides access to the Joint Venture Hospital located approximately 660 feet from the WT site. While located on Army land, the entrance to the WT site is only accessible by using Zuckert Road on Elmendorf AFB.

The APE includes the project site and the surrounding area, including four Air Force buildings and Bartlett High School that are within the view shed of the new construction. The APE was created in consultation with the State Historic Preservation Officer (SHPO) via email exchanges between Doug Gasek and FRA Historian, Lisa Graham on April 1 and 14, 2008. The construction footprint of the project involves 9.9 acres found on USGS topographic map ANC A-8, T13N, R3W, NW1/4 SEC 12, Seward Meridian, roughly centered at UTM coordinates zone 6N 352993E/6791904N (Figure 12).

Survey and Field Methods

In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. Historic contexts sources reviewed include Waddell (2003) and CEMML's (2000) "Cold War Resource Inventory: United States Army Alaska." The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area. Additional research consisted of meeting with Elmendorf AFB's Cultural Resources Manager, Jon Scudder, reviewing EAFB's Integrated Cultural Resource Management Plan and historic maps, and reviewing Bartlett High School and Anchorage School District websites.

An initial site visit was conducted by FRA Historian Lisa Graham during the spring of 2008 to assess potential view shed affects. On August 19, 2008 the construction APE was surveyed by a two-person crew employed by CEMML under the direct supervision of Edmund Gaines, M.A., R.P.A. Visual survey coverage, consisting of parallel pedestrian transects spaced at 10-20 m, covered 100% of the APE. No high-probability areas were identified for subsurface testing.

Nevertheless, subsurface testing was employed. Subsurface testing consisted of four 50 cm x 50 cm test pits screened through ¼" mesh and excavated to maximum depth possible.

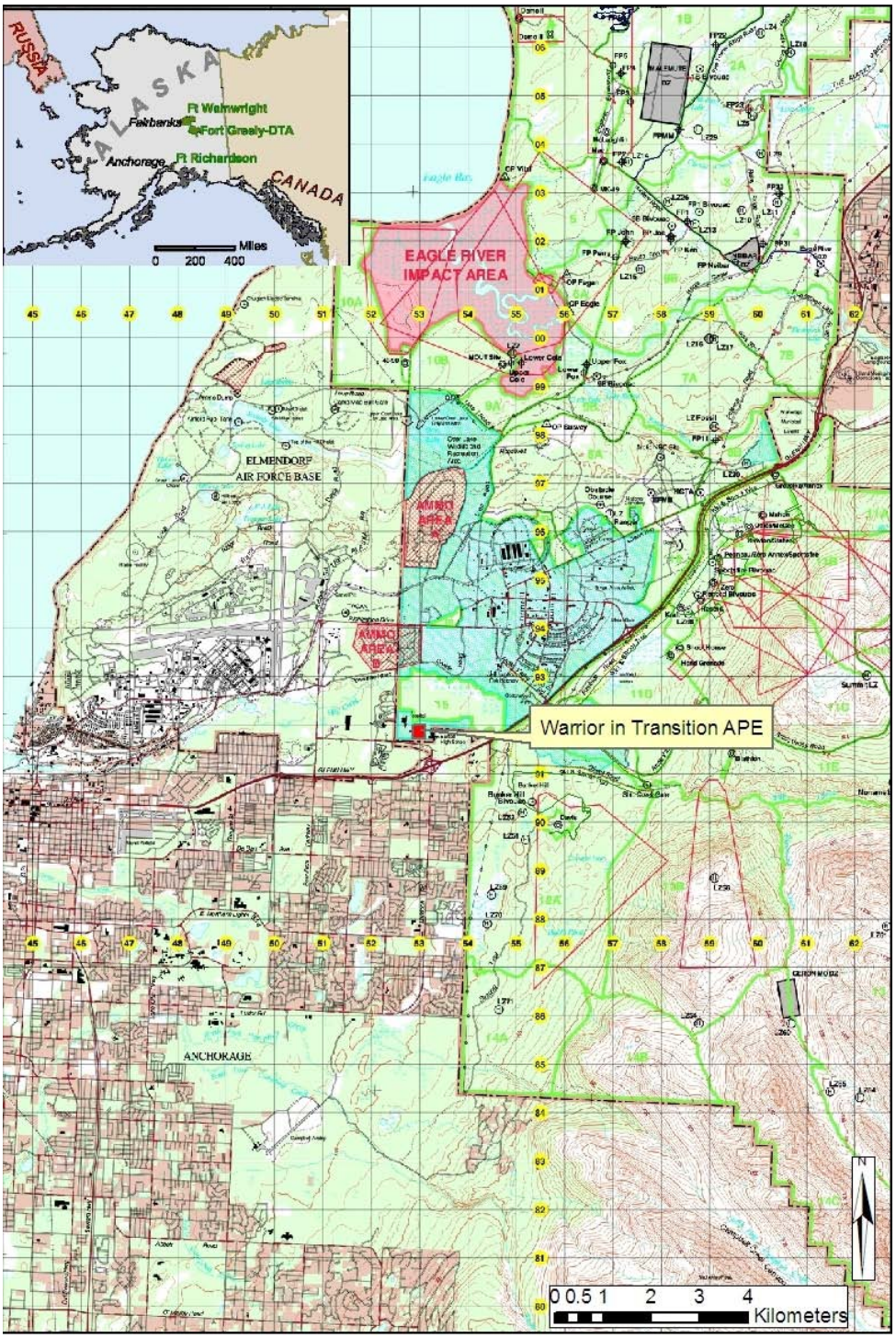

Figure 12. Warrior in Transition (WT) Area of Potential Effect (APE)

Findings
No cultural resources were identified within the proposed project area APE either through pedestrian survey or subsurface testing.

The area generally appears to have a low probability for cultural resources. Vegetation in the project area consists of a low, mixed needleleaf-broadleaf forest, with a thick understory comprised of alder, grasses, forbs, and weeds indicative of past ground disturbance (Figure 13). The project area is very flat, with a slope of 0-1% throughout its entire extent.

Figure 13. Typical vegetation in WT APE (view to east)

The project area exhibits what is commonly referred to as "vacant lot phenomenon", and contains a wide range of modern refuse. A discarded refrigerator was found in the central portions of the APE (Figure 14). The remains of two automobiles were also discovered. The first of these is the rusted rear portion of a cab and wheel wells of a late 1980's Chevrolet/GMC sedan (Figure 15). A metal box and several scraps of modern pressed plywood are in the immediate area. The second set of automobile remains consists of a detached hood (Figure 16). The make and model of the car is indeterminable; however, fresh, un-weathered blue paint indicates that it is less than 10 years old. Additional modern refuse consists of numerous modern brown glass beer bottles scattered throughout the APE—evidence of surreptitious drinking activities, perhaps undertaken by soldiers or airmen stationed at the adjacent installations, local residents, or students of the nearby high school.

Additional potential effects to buildings and historic structures in the vicinity were addressed by FRA Historian, Lisa Graham. The following is taken from a Section 106 consultation letter from Lisa Graham to the Alaska SHPO dated August, 2008:

"There are a number of buildings within the APE, but USAG FRA has found none of the buildings to be historic properties. Bartlett school was built in the 1971 and the school has since undergone renovation and expansion projects. Neither the school nor its associated structures and sites were found to have exceptional significance. The new residential buildings north of the project site are not historic properties as they are recent construction. The Air Force buildings were also built recently and none are considered exceptionally significant by the Air Force. The Air Force buildings are listed below:

Building Number	Year Constructed	Notes
4972	1999	Directly west of project site
4973	2000	Directly west of project site
4974	1998	Directly west of project site
5955	1996	Hospital

Additionally, the WT project site is currently undeveloped land covered with dense vegetation. The views to the existing high school are obstructed by vegetation from the interior of the site. While much of this vegetation will be removed for the WT Campus, all efforts will be made to preserve and increase this vegetative buffer. The houses in the Elmendorf AFB residential area to the north are also visually screened from the site by the existing thick vegetation."

Figure 14. Refrigerator (view to southeast)

Figure 15. Automobile #1 (view to west)

Figure 16. Automobile #2 (view to north)

Summary

USAG FRA determined that no historic properties will be affected by the proposed undertaking. No cultural resources were noted or discovered within the project APE. There is no reason to believe that the proposed project warrants any further fieldwork or consideration under Section 106 of the National Historic Preservation Act (16 USC § 470, as amended 2000), and regulations codified in 36 CFR 800 (as amended 2004). No indications of burials or other human remains were observed within the surveyed area; therefore, barring an unforeseen discovery during the undertaking, there are no further considerations expected under the Native American Graves Protection and Repatriation Act (25 U.S.C.§ 3001 *et seq*.).

2.4 Urban Assault Course Upgrades

USAG FRA has proposed upgrades to the existing Urban Assault Course (UAC) located within Training Area 12-A in the southern portion of Fort Richardson. This project is required to provide Live-Fire/Non Live-Fire, up to platoon-sized, Modified Military Operations on Urban Terrain (MOUT) for units of the US Army Alaska (USARAK) stationed at Fort Richardson, as well as Reserve and National Guard units. The facility will provide venues for the training and practice of tactics and techniques for urban/suburban operations under simulated combat conditions, along with infantry tactical training. Upgrades will include construction of the following: (1) an Urban Defense Building that consists of concrete block and reinforced concrete floor training building; (2) a Grenadier Gunnery Trainer that includes seven firing points, three hasty positions, two vehicle pads with vehicles, two low log walls and a two story facade that has one doorway and five windows—three on second floor and two on bottom floor; (3) an Individual Techniques Trainer that consists of building that has three 18' x 15' rooms that are joined and plywood doors that can be replaced frequently due to destruction from live-fire; (4) a General Instructional building consisting of a 74.3 m^2 concrete/masonry structure with slab-on-grade floor construction and metal standing seam roof on light gauge metal trusses; (5) a heated operation and storage building; and (6) a 2-hole heated latrine with vault. The APE of the proposed project will entail 10.2 acres on previously disturbed ground within the footprint of the current UAC, located on USGS topographic map ANC A-8, T13N, R2W, NW1/4 SEC 17, Seward Meridian, centered roughly at the UTM coordinates of zone 6N 356350E/6790263N (Figure 17).

Survey and Field Methods

In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. Sources in USAG FRA Department of Public Works library provided information on previous archaeological work in the area. The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area. Based on this research we determined that, while there is one previously recorded historic homestead site—ANC 1166— located roughly 750 m to the, no previously documented cultural resources were located within the APE.

On July 26, 2008, four archaeologists employed by Colorado State University, CEMML, under the direct supervision of archaeologist, Edmund Gaines, M.A., R.P.A. surveyed the proposed project's APE. Visual survey coverage, consisting of parallel pedestrian transects spaced at 10-20 m, included 100% of the APE. As the entire APE exhibits extensive previous ground disturbance resulting from construction of the existing UAC, no areas suitable for subsurface testing were identified.

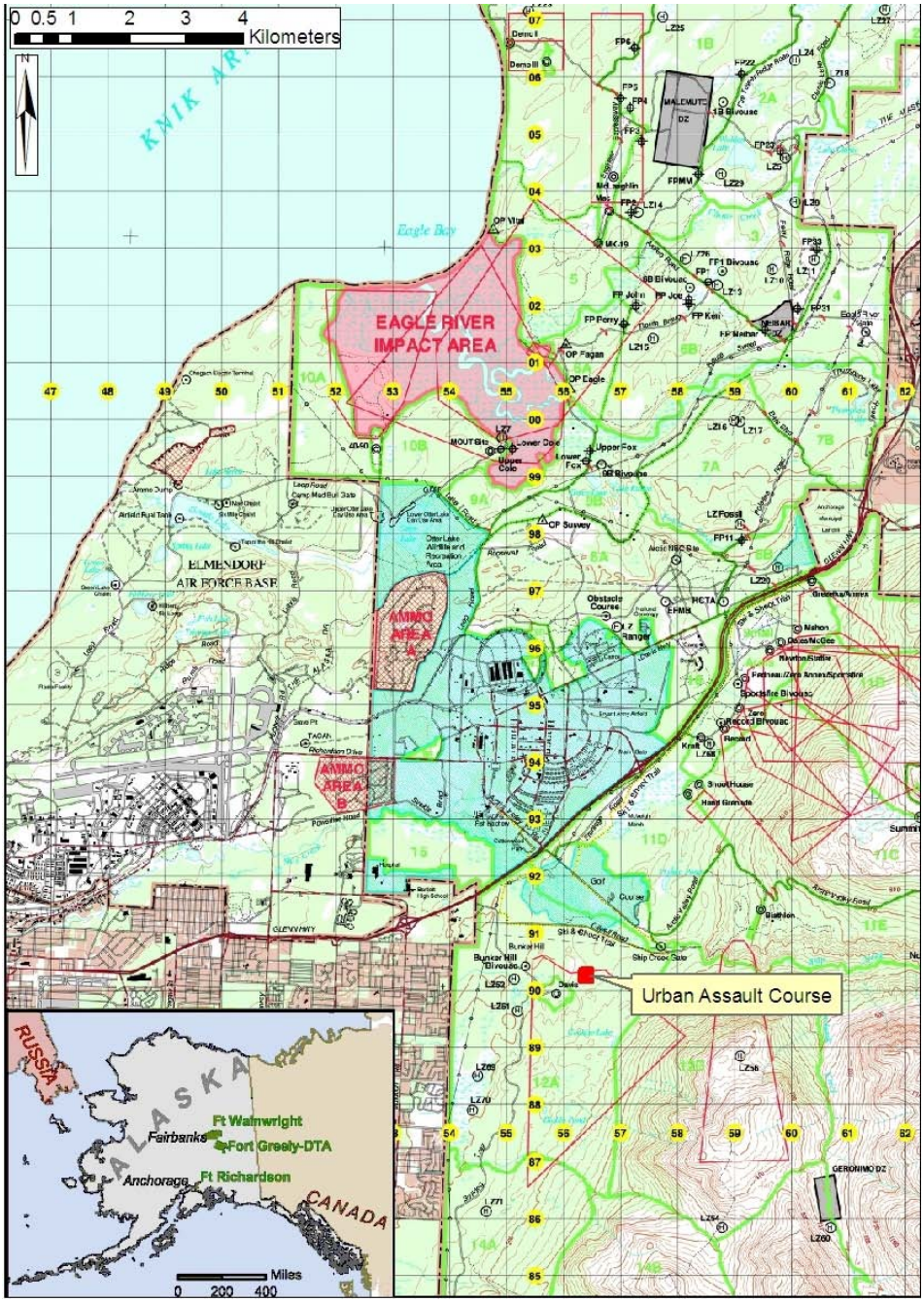

Figure 17. Urban Assault Course location

Figure 18. UAC overview (view to southeast)

Previously Identified Cultural Resources
There are no known cultural resources within roughly 700 m of the APE. Site ANC-1166 is located roughly 750 m away.

ANC-01166 is the remains of a historic homestead cabin that was constructed in 1938 by Alvin and Doris Meier (Hollinger 2001: 37-38, 49-50). The Meier's homestead claim was relinquished to the U.S. Army in 1941 (Holinger 2001: 38). The cabin is now deteriorated, with a collapsed roof and walls. ANC-01166 was deemed ineligible for inclusion in the National Register (Hollinger 2001: 50).

Findings
No cultural resources were identified within the proposed project area APE. The area appears to generally have a low probability for cultural resources. Field survey revealed that the entire area has been previously disturbed by construction of the existing UAC and associated training activities (Figure 18). The entire APE has been mechanically cleared and leveled, with some areas filled with pit-run gravel. The existing UAC consists of several plywood structures, and a large concrete bunker. Additional impacts are evident in the form of a berm surrounding the structures. Modern refuse consisting of 5.56 mm cartridge casings, bits of tinfoil and plastic, and

construction debris such as scraps of lumber, pipe and electrical wire, litters the ground surface. It is unlikely that any archaeological sites that may have been located in the immediate area would have remained undisturbed by previous construction and recreational activities.

Summary

USAG-FRA determined that no historic properties will be affected by the proposed undertaking. No cultural resources were discovered within the project APE. There is no reason to believe that the proposed UAC upgrade warrants any further fieldwork or consideration under Section 106 of the National Historic Preservation Act (16 USC § 470, as amended 2000), and regulations codified in 36 CFR 800 (as amended 2004). No indications of burials or other human remains were observed within the surveyed area; barring an unforeseen discovery during the undertaking, there will be no further considerations expected under the Native American Graves Protection and Repatriation Act (25 U.S.C.§ 3001 *et seq*.).

3.0 FORT WAINWRIGHT (FWA)

FWA's training lands (Figure 1) include three main areas: the Yukon Training Area (YTA); the Tanana Flats Training Area (TFTA); and the Donnelly Training Area (DTA). Archaeological fieldwork at FWA in 2008 consisted of two range development projects at the YTA, and three Section 110 survey and evaluation projects at the TFTA. YTA range development projects consisted of upgrades to Firing Point Hippie and adjacent bivouac area construction, and upgrades to Beaver Creek Road. No historic properties will be affected by either of these proposed projects. Section 110 field work was conducted at the TFTA and included: (1) Survey of low unnamed hills adjacent to the Wood River; (2) Subsurface testing and high-precision mapping of FAI-0197; and (3) Subsurface testing, and high-precision mapping of site FAI-01375. Results of fieldwork conducted at the DTA are primarily reported in the DTA Annual Report (Robertson 2009); however, this report includes the results of survey conducted in the Granite Training Range of DTA East triggered by the Mobility and Maneuverability Enhancement trails upgrades.

Setting & Environment

Fort Wainwright 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 cities of Fairbanks and North Pole in the Fairbanks North Star Borough. Fort Wainwright has the northern continental climate of the Alaskan interior, characterized by short, moderate summers, long, cold winters and little precipitation or humidity. Average monthly temperatures in Fairbanks range from –11.5° F in January to 61.5° F in July, with an average annual temperature of 26.3° F. The record low temperature is -66° F and the record high is 98° F. Average annual precipitation is 10.4", most of which falls as rain during summer and early fall. Average annual snowfall is 67", with a record high of 168" during the winter of 1970-71 (Natural Resources Branch 2002).

Prehistoric Background

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 proposed complexes or subdivisions 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 bifacial 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 currently unresolved. Contrary to previous interpretations, current research (e.g. Holmes 1998; 2007; 2008), suggests 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 appears 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 2001; Shinkwin 1979). Athabaskan sites tend to occur in resource-rich areas near lakes, stream and rives, and are generally characterized by large house-pit and cache pit features. Proto-historic Athabaskan assemblages include Euroamerican 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).

Historic Background

FWA's training lands fall within an area occupied at the time of Euro-American contact by Lower-Middle Tanana Athabaskans, including 'bands' described generally as the Salcha, Big Delta-Goodpaster, Wood River and Chena bands (McKennan 1981; Andrews 1975; Mischler 1986). Historical accounts document traditional settlement patterns that were focused on a widely mobile seasonal round, with the fall caribou hunt playing a pivotal role in subsistence preparations for the winter, and summer activities focused at fish camps, in berry and root collecting, and sheep hunting (McKennan 1981). These activities were frequently communal, with several local 'bands' connected by common interest, geography and intermarriage. Despite anthropological attempts to define '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 life ways 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 arrival of missionaries in the Alaskan interior 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 Tanana Valley increased, the need for reliable transportation routes and communication systems rose in tandem. Existing trails, such as the Bonnefield, 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.

As Fairbanks grew in the first decade of the 20th century, several agricultural homesteads were developed on lands now encompassed by sections of the FWA cantonment. These homesteads provided Fairbanks with a variety of agricultural products and wood for fuel, but were subsumed when lands were withdrawn for the creation of Ladd Field, which later became FWA (Price 2002).

Development in the Alaskan interior increased dramatically with the advent of World War II and subsequent military build-up in Alaska. Of particular significance was the development of airfields near Delta Junction (Fort Greely), Fairbanks (Ladd Field, later FWA) 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.

Fort Wainwright Cultural Resources

Archaeological research on FWA's training areas has resulted in numerous technical reports (Bacon 1978; Bacon and Holmes 1979; Dixon et al. 1980; Frizzera 1973; Hedman et al. 2003; Higgs et al. 1999; Holmes 1979; Potter et al. 2000; Rabich and Reger 1978; Raymond-Yakoubian and Robertson 2005; Robertson et al. 2004; Robertson et al. 2006; Staley 1993), scientific papers (Holmes and Anderson 1986; West 1967, 1975), and the identification of over 500 prehistoric and historic archaeological sites. Work on FWA has been largely stratified sampling in nature, generally focusing on known recorded sites and areas thought to be of very highest potential for containing archaeological sites. Thus, while a large number of important sites have been identified on FWA training lands, a number of important gaps exist in the cultural resource inventory.

Fort Wainwright's training lands have supported human populations for the past 10,000 to 12,000 years. The archaeological record known from FWA represents all of the currently recognized prehistoric cultures of the Alaskan Interior. Of particular significance is the role played by sites located on Army lands in the definition of the Denali Complex of the American Paleoarctic Tradition (Anderson 1970; West 1967, 1981). Though not located on Army lands, two of the oldest well-dated sites in North America—Swan Point and Broken Mammoth, dated to between 11,500 and 12,400 radiocarbon years before present (BP)—are located in the Tanana Valley less than 50 km south of the YTA (Holmes 1996, 1998; Holmes et al. 1996; Yesner et al. 1999). The oldest radiocarbon date for any item found on DTA is 9920+/-60 years BP (Beta-123331), from charcoal at site XBD-00167 (Higgs et al. 1999). Sites yielding Northern Archaic side-notched points are common (Robertson et al. 2004; 2005; Raymond-Yakoubien and Robertson 2005). At the Donnelly Training Area (DTA), site XMH-874 yielded an AMS date of 5720 +/- 50 BP from hearth charcoal associated with a microblade component (Robertson et al. 2008). A late prehistoric Athabaskan occupation is recognized at several sites (e.g. Andrews 1975, 1987; Cook 1989; Mishler 1986; Sheppard et al. 1991; Shinkwin 1979; Yarborough 1978). Of particular interest in this regard is a copper projectile point recently found in a buried context at the DTA (Roberston et al. 2009). Euro-American historic archaeological sites are also present (Gamza 1995; Phillips 1984).

3.1 Yukon Training Area (YTA)

The FWA YTA (Figure 1) consists of 249,552 acres within the western portion of the Yukon-Tanana Uplands section of the Northern Plateau physiographic province of Interior Alaska (Wahrhrftig 1965). This area is characterized by round even-topped, north-east to east trending ridges that rise roughly 150 to 450 m above adjacent valley floors to an elevation of 450-915 masl (meters above sea level). Bedrock is primarily composed of Precambrian Birch Creek schist, with few areas of granite and quartz diorite. Most of the YTA is covered by a thin (1-200 cm) mantle of micaceous aeolian silt (loess) derived from outwash plains south of the Tanana River (Muhs and Budhan 2006). Soils are typically well-drained brown silt loam associated with poorly drained silt loams in depressions and drainages (Natural Cooperative Soil Survey 1999).

The YTA is home to 14 known prehistoric sites, most of which were found by C.E. Holmes (1979), and CEMML archaeologists between 2002 to 2005 (Hedman et al. 2003; Raymond-Yakoubian 2004, Raymond-Yakoubian and Robertson 2005).

During the summer of 2008, range development projects triggered Section 106 NHPA archaeological surveys. These included an 11.44 acre survey of Firing Point Hippie and adjacent bivouac area, and a roughly 20 km linear survey of Beaver Creek Road. No historic properties will be affected by either project.

3.2 Firing Point Hippie Upgrades, YTA

USAG FWA has proposed to upgrade the existing Firing Point Hippie and associated Bivouac Area within Yukon Training Area 3 on FWA (Figure 19). The purposes of this project are: 1) to minimize impacts associated with military training exercises; 2) provide units with an area to practice live indirect fire operations; and 3) open areas for vehicle traffic and tent sites. The proposed project will consist of grading and hardening a 6.44 acre pad on the existing firing point, and thinning 5 acres of adjacent forest, located to the west of the existing firing point, for increased use as a bivouac area (Figure 2). The trails in the bivouac area will be hardened to sustain heavy vehicular traffic. (UTM coordinates of WS 514918-WS 7171928). The APE of the proposed project consists of 11.44 acres found on USGS Big Delta C-6 topographic map, N1/2 SEC 11, T3S, R5E, Fairbanks Meridian (UTM coordinates of zone 6N 514918E/7171928N).

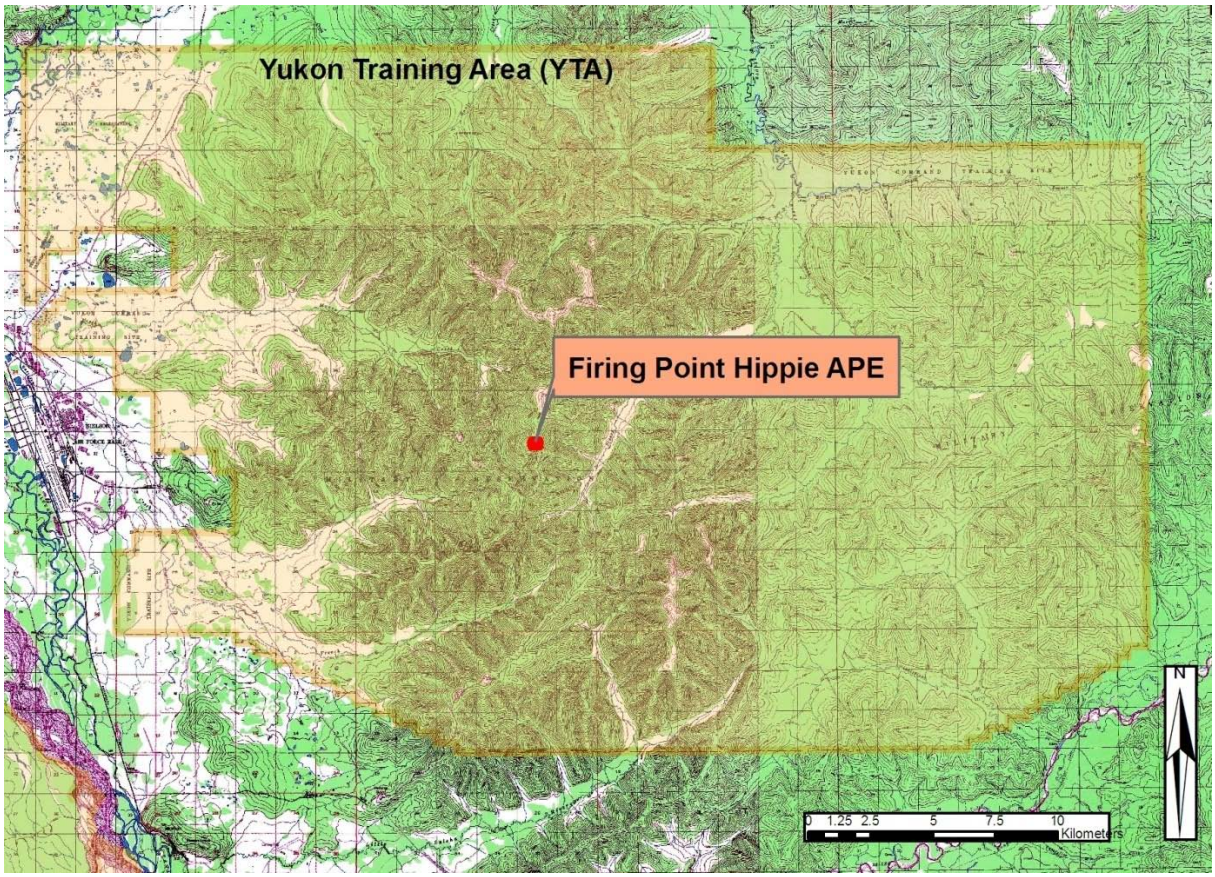

Figure 19. Location of Firing Point Hippie and APE

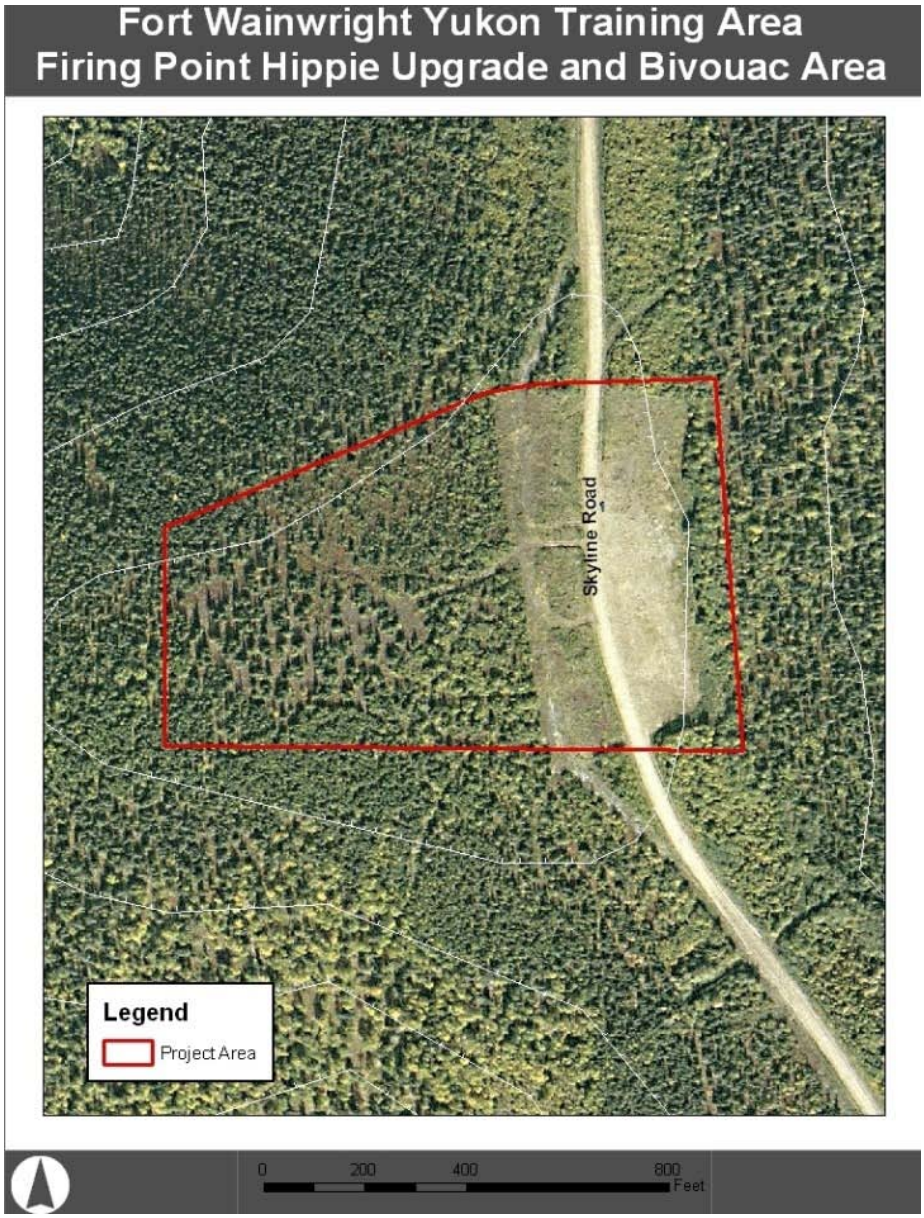

Figure 20. Firing Point Hippie APE

Survey and Field Methods

In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. Sources in USAG FWA Department of Public Works library provided the majority of the information about the area. The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area. Based on this research we determined that, while there is one previously recorded prehistoric site—XBD-00093— located 1.3 km to the north, no previously documented cultural resources were located within the APE.

On August 8, 2008, Colorado State University, CEMML, archaeologist, Edmund Gaines, M.A., R.P.A. surveyed the proposed project APE. Visual survey coverage, consisting of parallel pedestrian transects spaced at 10-20 m included 100% of the APE. Subsurface testing was conducted in areas of higher site probability on a broad flat area suitable for human habitation on the crest of the ridge. Subsurface testing consisted of five 50 cm x 50 cm test pits excavated to the depth of bedrock and screened through ¼" mesh.

Previously Identified Cultural Resources
There are no known cultural resources within 1000 m of the APE. Site XBD-00093 is located 1.3 km to the north of the project area.

XBD-00093
Determination of Eligibility: not eligible
Originally found by Holmes (1979: 14), XBD-0093 consists of a single beige, coarse-grained chert, bifacial-thinning flake recovered from the surface. The site area exhibits granitic outcrops with little to no fine-grain deposition. Holmes (1979) reported the site as an isolated artifact and recommended no further assessment. No additional artifacts or cultural material were found at the site or in the vicinity during investigations in 2008.

Results
No cultural resources were identified within the proposed project area APE during pedestrian survey or subsurface testing.

The project area lies on the crest of a large, north-south trending ridge at an elevation of 640-655 masl. The proposed bivouac area and existing firing point are on a broad, relatively flat spot covering approximately 11.44 acres. The terrain drops sharply to Stuart Creek drainage, located roughly 2.7 km to the east. A steep slope also drops to the west, providing a prominent view of the Tanana Valley far in the distance. The surrounding landscape consists of extensive ridge systems and rolling uplands typical of the YTA.

The project area contains a mix of disturbance vegetation and upland needleleaf forest. Willow and alder shrub, and grasses grow in the previously disturbed footprint of the existing firing point (Figure 21). The bivouac area contains a black spruce forest with moss and herbaceous shrub understory (Figure 22).

The APE appears to have a low probability for cultural resources. Although located on a ridge top, the view shed from the APE is limited by surrounding hilltops and ridges. The nearest source of freshwater, Stuart Creek, is more than 3 km distant and 500 m lower in elevation. Additionally, the existing firing point has been entirely disturbed by grading and clearing activities making it less likely that there will be intact archaeological remains.

Figure 21. Existing Firing Point Hippie (view to north)

Figure 22. Typical vegetation in Bivouac Area (view to west)

Recent use of the area appears to be primarily related to military training activities, and recreational hunting. Numerous 5.56 mm blank cartridges were found across the project area. Spent cartridge casings also include 5.56 mm brass and plastic .12 gauge shotgun shells. Two hunting tree stands, constructed of milled, pressed 2” x 4” dimensional lumber with galvanized nails, are in spruce trees in the proposed bivouac area (Figure 23). The degree of weathering exhibited by the lumber indicates that it was constructed less than 10 years ago. A stone-circled, slab-lined fire pit, with the remains of several fuel logs is in the existing firing point (Figure 24). Modern refuse across the APE includes empty food cans, empty Meal-Ready-To-Eat (MRE) ration packets, bits of tinfoil and plastic, and two plastic grocery bags filled with ruffed grouse wings.

Figure 23. Hunting stand in Bivouac Area (view to south)

Subsurface testing revealed the stratigraphy of the project area to consist of 50-100 cm of Aeolian silt disconformably overlying schist bedrock (Figure 25). Soil development across the tested area consists of a 5-10 cm thick O horizon overlying an 8-12 cm thick dark brown silty O/A horizon, which, in turn overlies a poorly expressed, 8-16 cm thick reddish silt Btw horizon. The underlying silt C horizon, which shows no evidence of post-depositional alteration due to soil formation, is 40-60 cm thick and exhibits coarse mottling and evidence of cryoturbation. In addition to the lack of artifacts, none of the test pits contained any charcoal or other hints of buried archaeological remains.

Figure 24. Modern slab-lined fire pit in existing firing point (view to north)

Figure 25. Test pit stratigraphy (scale is extended 1 m)

Summary and Recommendations

USAG FWA determined that no historic properties will be affected by the proposed undertaking. Based on the results of our field observations and archival research, there is no reason to believe that the proposed upgrade to Firing Point Hippie and adjacent bivouac area warrant any further fieldwork or consideration under Section 106 of the National Historic Preservation Act (16 USC § 470, as amended 2000), and regulations codified in 36 CFR 800 (as amended 2004). No cultural resources were discovered within the project APE. No indications of burials or other human remains were observed within the surveyed area; therefore, barring an unforeseen discovery during the undertaking, there will be no further considerations under the Native American Graves Protection and Repatriation Act (25 U.S.C.§ 3001 *et seq*.).

3.3 Beaver Creek Road Upgrades, YTA

USAG FWA has proposed upgrades to Beaver Creek road in Yukon Training Area 2 on FWA. The proposed project consists of upgrades to roughly 20 km of road. The project would remove brush and vegetation to within 4” of the ground surface along the road corridor. This work would take place within a 20’ wide strip on either side of the road surface. Additional work would include grading and hardening sections of the existing roadway. The APE of the proposed project is found on USGS Big Delta D-6 topographic map. The linear APE crosses Sections 5, 6, 8, 12, 14, 15, and 16 of T2S, R4E, and Sections 16, 17, and 18 of T2S, R5E of the Fairbanks Meridian (Figure 26).

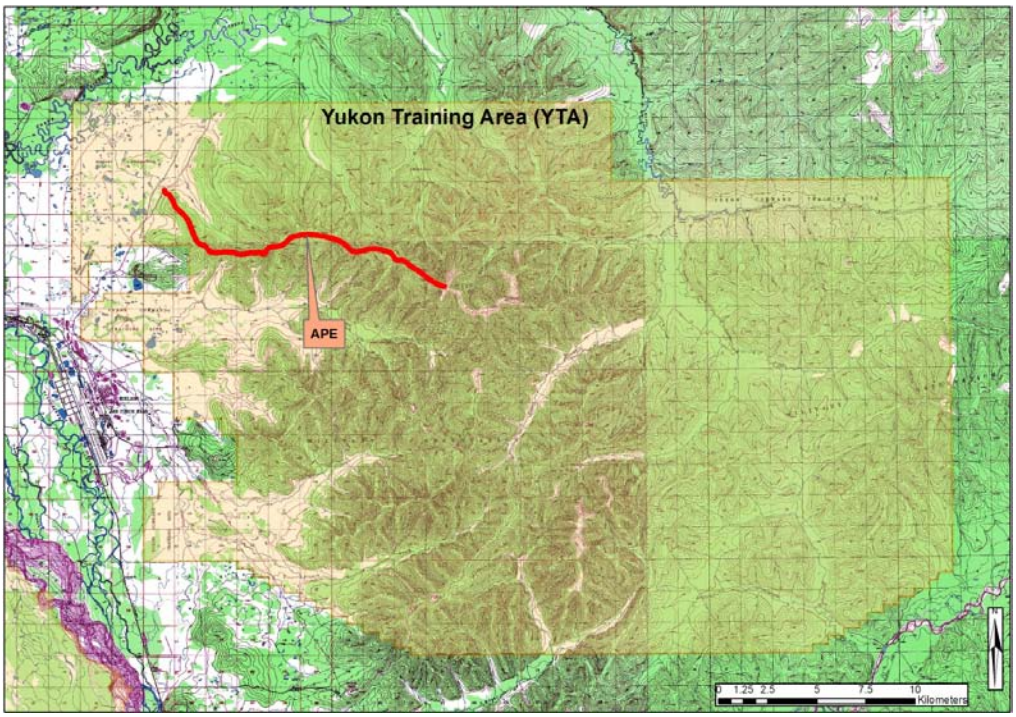

Figure 26. Location of Beaver Creek Road APE

Survey and Field Methods

In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. Sources in USAG FWA Department of Public Works library provided the majority of the information about the area. The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area. Based on this research we determined that there are no previously documented cultural resources located within the APE; however, there are five sites located within five kilometers of the APE.

On September 9 and 10, 2008, the proposed project APE was surveyed by a team of eight Colorado State University, CEMML, archaeologists, under the direction of Edmund Gaines, M.A., R.P.A. Visual survey coverage, consisting of parallel pedestrian transects spaced at 10-20 m, included 100% of the APE. Subsurface testing was conducted in areas of higher site probability typically consisting of broad flat areas suitable for human habitation on the ridge crests and hill tops. Subsurface testing consisted of more than thirty 50 cm x 50 cm test pits excavated to bedrock and screened through ¼" mesh.

Previously Identified Cultural Resources

There are no known cultural resources within 1 km of the APE. There are, however, four prehistoric sites located in the general vicinity (Figure 27). These are as follows:

FAI-01556
Determination of Eligibility: not evaluated
Site FAI-01557 was found by CEMML archaeologists during 2002 surveys (Hedman at al. 2003: 31-32). The site consists of more than 87 pieces of lithic debitage and more than 80 fragments of calcined bone recovered from two 1 x 1 m units. The site has yet to be evaluated; however, the presence of buried artifacts and faunal remains underscores its significance. The site is located 1.4 km outside the APE.

XBD-00105
Determination of Eligibility: not eligible
Site XBD-00105 was originally reported by Holmes (1979: 21) as the find location of a black chert, wedge-shaped microblade core. Holmes (1979; 21) interpreted the artifact as an isolated find and recommended no further action. The site is located 1.8 km outside the APE.

XBD-00111
Determination of Eligibility: not eligible
Site XBD-00111 was originally discovered by Holmes (1979:21) and consisted of three black chert flakes found in a disturbed surface of Beaver Creek road. Given that it was a surface find in a disturbed area, the site was considered ineligible and no further action was recommended. The site is located more than 4 km outside the APE.

XBD-00264
Determination of Eligibility: not evaluated
Originally reported by Raymond-Yakoubian (2006: 22-23), this site consists of an isolated find of a gray chert projectile point base found on the surface of a cleared hilltop next to a Remote Threat Emitter on Skyline Road. The fragment of the projectile point base was found in two pieces, located directly adjacent to each other. The site is located 2.3 km outside the APE.

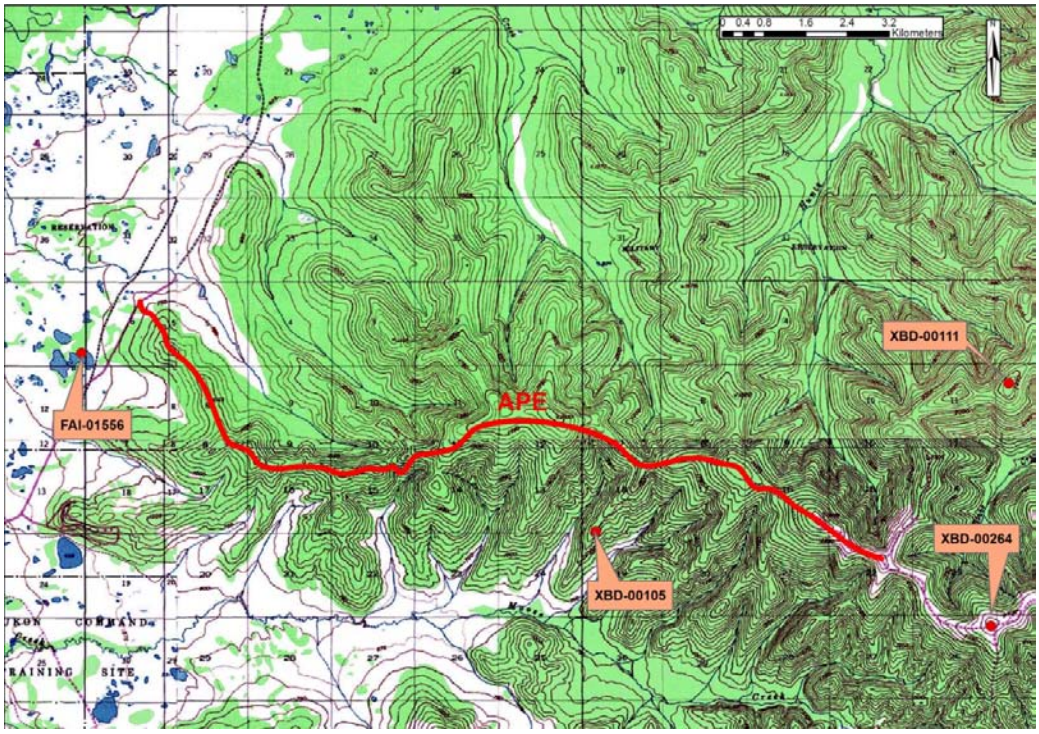

Figure 27. AHRS sites in vicinity of Beaver Creek Road

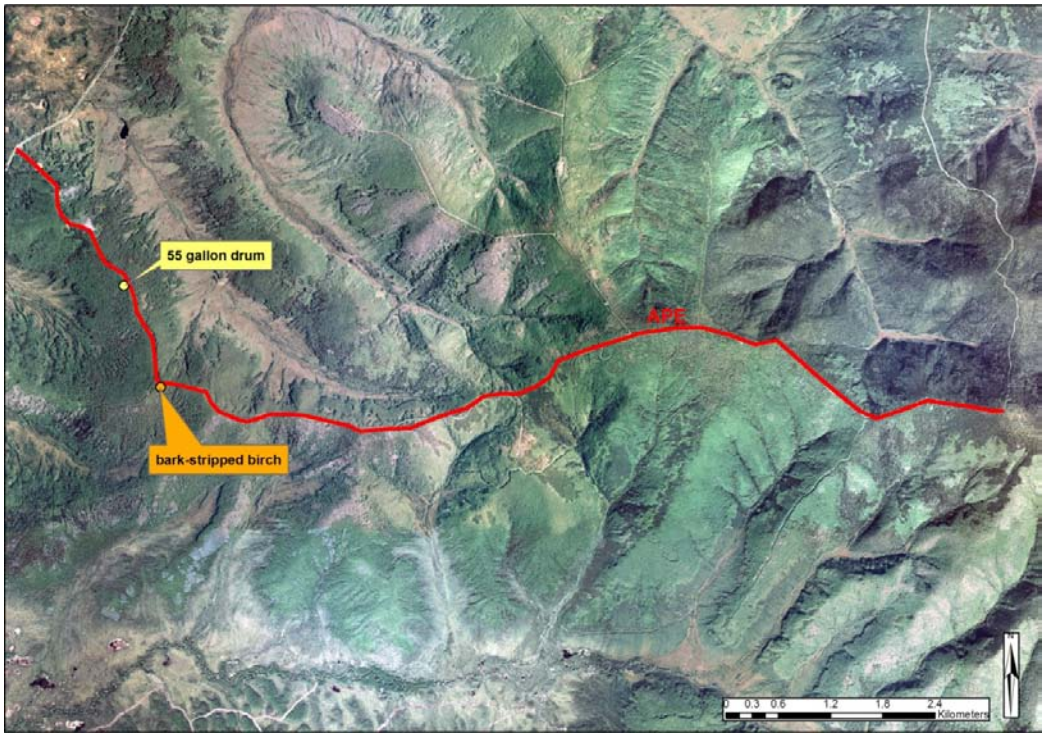

Figure 28. Beaver Creek Road survey findings

Results
No cultural resources were identified within the proposed project area APE during pedestrian survey or subsurface testing.

Vegetation generally consists of hardwood and mixed needleleaf-hardwood forests (Figure 29). The understory typically consists of grasses, alders and willows. The nature of the understory vegetation indicates a degree of ground disturbance sometime in the past, probably related to original road construction or maintenance. There is an area cleared for power line construction that is covered primarily by grasses and dwarf birch and extends roughly 5-7 m to the south of the roadway (Figure 29).

The APE appears to generally have a low probability for cultural resources. Although located on the crests of several ridge tops, the view shed tends to be limited by surrounding hilltops and ridges. There is a lack of available freshwater sources in the area. Nearly the entire APE shows signs of previous disturbance.

One bark-stripped paper birch tree was identified (Figure 28). The bark on this tree has been completely stripped around the entire circumference, leaving a scar roughly 20 cm high around the entire trunk of the tree. Subsurface testing in the vicinity of this tree yielded no evidence of cultural remains.

Figure 29. Overview of Beaver Creek Road APE (view to east)

Figure 30. Bark stripped birch tree

Figure 31. 55 gallon drum

Figure 32. Typical test pit stratigraphy

There is abundant evidence of recent use of the road, primarily in the form of discarded trash and litter. A large 55 gallon drum (Figure 31) is probably related to military training activities.

Subsurface testing revealed the stratigraphy of the project area to generally consists of 30-100 cm of aeolian silts and sands disconformably overlying schist bedrock (Figure 32). Soil development across the tested area consists of an O to OA horizon 5-10 cm thick overlying a 5-10 cm thick dark brown A to AB horizon, which, in turn overlies a poorly expressed, 5-10 cm thick reddish Btiw horizon. The underlying silt and sand C horizon, which shows no evidence of post-depositional alteration due to soil formation, is 30-70 cm thick and exhibits coarse mottling and some evidence of cryoturbation. In addition to the lack of artifacts, none of the test pits contained any charcoal or other hints of buried archaeological remains

Summary and Discussion

No cultural resources were noted or discovered within the project APE.

In terms of the identified bark-stripped birch tree, CMTs have come under increasing research in the past 15 years, recognizing the significance of such trees in understanding Native and non-Native forest use (Mobley and Eldridge 1992: 91-110; Eldridge 1997). However, previous research has largely focused on the Pacific Northwest, British Columbia, and Southeast Alaska, where CMT's are predominantly spruce, cedar and hemlock (e.g. Eldridge 1997; Stryd 1998; Mobley and Eldridge 1992). CMT tree studies have thus been directed on a much different history of use and ecological environment than that of the paper birch trees that predominate the Fort Richardson area. Additionally, paper birch have a life span that rarely exceeds 100 years of

age (Johnson et al. 1980), rendering the age and potential significance of bark-stripped trees difficult to determine without further traditional use studies. Given these factors, and the lack of cultural materials identified in the vicinity either on the surface or in test pits, this tree is considered ineligible for listing in the NRHP, and no further action is recommended.

USAG FWA determined that no historic properties will be affected by the proposed undertaking. There is no reason to believe that the proposed Beaver Creek Road upgrade warrants any further fieldwork or consideration under Section 106 of the National Historic Preservation Act (16 USC § 470, as amended 2000), and regulations codified in 36 CFR 800 (as amended 2004). No indications of burials or other human remains were observed within the surveyed area; barring an unforeseen discovery during the undertaking, there will be no further considerations expected under the Native American Graves Protection and Repatriation Act (25 U.S.C.§ 3001 *et seq*.).

3.4 Tanana Flats Training Area (TFTA)

The TFTA encompasses 653,748 acres, located to the south and west of the Tanana River. The TFTA occupies the majority of the land between the Wood and Tanana Rivers, and stretches 32 miles south of Fairbanks. The area is located in the Tanana-Kuskokwim lowlands (Waharftig 1965) and is characterized by several topographically higher features on the landscape: Clear Creek Butte; Wood River Buttes; and the highlands surrounding Blair Lakes, which contain the highest point in the flats, a hill that rises to an elevation of 426 masl. The flats were formed by the northern migration of the Tanana River in response to uplift and orogeny associated with the Alaska Range to the south. The majority of the area is composed of recent swamp deposits and flood plain alluvium. Higher landforms such as the Wood River Buttes, Clear Creek Butte and the Blair Lakes hills are capped by a thin mantle of aeolian silt (loess).

The TFTA is home to 51 known prehistoric sites; 10 historic sites, and 2 Archaeological Districts: Clear Creek Buttes Archaeological District (5 sites on the crest of Clear Creek Buttes); and Blair Lakes Archaeological District (6 prehistoric sites located on north shore of Blair Lakes South).

During the summer of 2008, CEMML conducted three Section 110 inventory and assessment projects at the Tanana Flats Training Area. This work included: (1) survey of roughly 25 acres on low unnamed hills on the east bank of the Wood River; (2) evaluations of site FAI-00197 in the Clear Creek Buttes Archaeological District; and (3) survey of 40 acres and evaluations of site FAI-01357.

3.5 Wood River Survey, TFTA

The Wood River extends roughly 103 km from its headwaters to its confluence with the Tanana River and forms the western boundary of the TFTA. The river runs through generally flat, swampy terrain; however there are two topographic features on the east bank of its upper reaches in which prehistoric sites have been found. The first of these is the Wood River Buttes, a series of Buttes comprised of Devonian-aged mafic and ultra-mafic igneous rocks that rise to elevations of 300 masl. The Wood River Buttes is home to 26 prehistoric sites identified by Dixon et al. (1980). Roughly 5 km south of the Wood Rive Buttes, is a ridgeline and series of low, unnamed knolls that extend 1.5 km from the river, cover around 45 acres, and rise to a maximum elevation of 220 masl. Holmes (2001) identified site FAI-01356 on the ridgeline adjacent to the river; however 99% of the landform was previously un-surveyed. Section 110 fieldwork conducted during 2008 consisted of survey of roughly 25 acres along the ridgeline and hills.

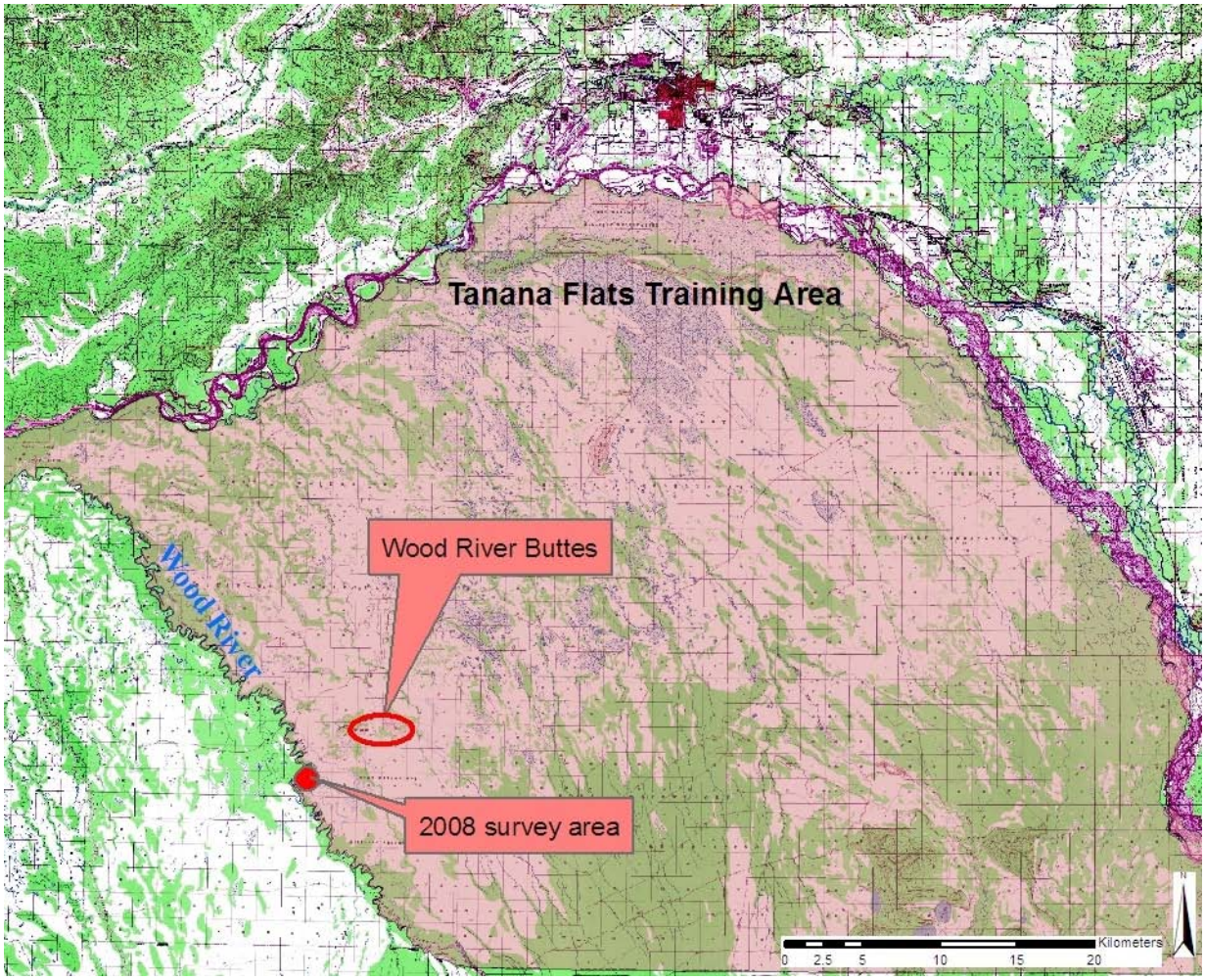

Figure 33. Wood River, Buttes, and 2008 survey area

Survey Methods
On August 5, 2008, a crew of two Colorado State University, CEMML, archaeologists under the direct supervision of archaeologist, Edmund Gaines, M.A., R.P.A, conducted the archaeological survey. Visual survey coverage consisted of parallel pedestrian transects spaced at 10-20 m walked along the entire crest of the ridgeline. Due to time constraints, no subsurface testing was conducted.

FAI-01356
Determination of Eligibility: Not evaluated

Originally identified and reported by Holmes (2001 AHRS card), FAI-01356 is located on a low northeast-southwest trending ridge that rises roughly 15-20 m above the valley floor, roughly 100 m to the east of Wood River. A game trail runs the crest of the ridge exposing more than 50 pieces of late stage lithic debitage and calcined bone fragments. Surface visibility—limited to areas disturbed by the trail—is estimated at 5-10%. The view shed at the site is roughly 90º with an open view to the south providing a prominent view of the Alaska Range. The view to the east, west and north is obscured by large spruce trees. Site vegetation on the northern, eastern and western slope of the landform consists of white and black spruce with moss understory. The crest and southern slope contain grasses and dwarf scrub.

Survey efforts during the summer of 2008 relocated the site. The site consists of at least 50 flakes and numerous calcined bone fragments exposed in the game trail for a distance of at least 65 m. Additional micro-debitage and very small pieces of calcined bone were observed in the back dirt from three ant hills. Nearly all of the lithic debitage observed is late-stage bifacial-thinning, tertiary reduction, and small pressure flakes. Material types include tan rhyolite, grey rhyolite, obsidian, basalt, grey chert, black chert, basalt, translucent/black banded chert, and dark reddish chert (probably burned). All observed obsidian (three flakes) was collected. XRF analysis of the obsidian indicates that it is from the Batza Tena source (Appendix 1), located on the Koyukuk River more than 400 km to the north.

One tool, a unifacially retouched blade-like flake, was also collected. The artifact is a proximal end of a blade like flake, found in two refittable pieces. It measures 45.6 mm long, 19.1 mm maximum width, and 4.9 mm maximum thickness. It has two parallel arrises, a prominent bulb of percussion, and a well-prepared, lipped platform. Steep, sub-parallel retouch extends down the entire length of each edge.

The presence of a plastic focusing knob from Bushnell® binoculars attest to the area's modern use.

No shovel tests were excavated; however there is a high potential for buried remains. While the landform is a bedrock ridge, rocky outcrops are limited in extent and the entire landform is capped by aeolian silt. There is little to no disturbance to the site.

Figure 34. FAI-01356 retouched blade-like flake

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of disturbance and surface exposure that revealed the observed artifacts. In total, the surface is exposed over less than 5% of the site. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If a proposed range development project entails impacts to the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

FAI-01885
Determination of Eligibility: Not evaluated

FAI-01885 is located on a prominent butte that rises roughly 50 m above the valley floor, approximately 850 m from Wood River. A game trail runs the crest of the hill exposing more than 30 pieces of late-stage lithic debitage and eight calcined bone fragments. Surface visibility—limited to areas disturbed by the trail—is estimated at 5-10%. The view shed at the site is roughly 360º with commanding views of both the Tanana Valley and the Nenana Valley. Wood River Butte west is visible as are the Blair Lakes Buttes and the town of Nenana. Site vegetation is mainly low scrub, grasses, sage, and low-bush cranberry, with some scattered needleleafs and broadleafs on the northern slope. The site contains two loci: Loci 1—the main concentration of material on the crest of the hill; and Loci 2—a small lithic scatter on a knob on the hill slope 50 m to the west.

Site FAI-01885 was found through pedestrian survey. Loci 1 consists of at least 30 flakes and at least eight calcined bone fragments exposed in the game trail for a distance of around 50 m. Nearly all of the lithic debitage observed is late-stage bifacial-thinning, tertiary reduction, and

small pressure flakes. Material types include tan rhyolite, grey rhyolite, obsidian, basalt, grey chert, black chert, translucent/black banded chert, and bright red chert/jasper. Loci 2 consists of five flakes—gray chert and tan rhyolite late-stage bifacial thinning flakes— found in a discrete area on a knob on the east slope of the hill less than 50 m from Loci 1.

No shovel tests were excavated; however there is a high potential for buried remains. While the landform is a bedrock ridge, rock outcrops are limited in extent and the entire landform is capped by aeolian silt. There is little to no disturbance to the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of disturbance and surface exposure that revealed the observed artifacts. In total, the surface is exposed over less than 5% of the site. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If a proposed range development project impacts the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

FAI-01886
Determination of Eligibility: Not evaluated

FAI-01886 is located on a prominent butte that rises roughly 15 m above the valley floor, approximately 490 m away from Wood River. A game trail runs the crest of the hill exposing at least 10 pieces of late-stage lithic debitage. Surface visibility—limited to areas disturbed by the trail—is estimated at 5-10%. The view shed at the site is roughly 90º with an open view to the south providing a prominent view of the Alaska Range. The view to the east, west and north is obscured by large spruce trees. Site vegetation on the northern, eastern and western slope of the landform consists of white and black spruce with Labrador tea and moss understory. The crest and southern slope contain grasses and dwarf scrub.

Site FAI-01886 was found through pedestrian survey. The site consists of at least 10 flakes and concentration of calcined bone fragments exposed in the game trail for a distance of at least 35 m. All of the lithic debitage observed is late-stage bifacial-thinning, tertiary reduction, and small pressure flakes. Material types include tan rhyolite, grey rhyolite, dark grey chert, and translucent/black banded chert.

No shovel tests were excavated; however there is a high potential for buried remains. While the landform is a bedrock ridge, rock outcrops are limited in extent and the entire landform is capped by aeolian silt. There is little to no disturbance to the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of disturbance and surface exposure that revealed the observed artifacts. In total, the surface is

exposed over less than 5% of the site. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If a proposed range development project entails impacts to the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

FAI-01887
Determination of Eligibility: **Not evaluated**

FAI-01887 is located on a prominent butte that rises roughly 15 m above the valley floor, approximately 245 m away from Wood River. A game trail runs the crest of the hill exposing at least 10 pieces of late-stage lithic debitage. Surface visibility—limited to areas disturbed by the trail—is estimated at 5-10%. The view shed at the site is obscured by large spruce trees; however, with no trees present it would offer a 360º panorama. Site vegetation consists of black spruce with moss, lichen and low-bush cranberry understory. The crest and southern slope contain grasses and dwarf scrub.

Site FAI-01887 was found through pedestrian survey. The site consists of at least 10 flakes exposed in the game trail for a distance of at least 10 m. All of the lithic debitage observed is small pressure flakes of tan rhyolite and grey chert.

No shovel tests were excavated; however there is a high potential for buried remains. While the landform is a bedrock ridge, rock outcrops are limited in extent and the entire landform is capped by aeolian silt. There is little to no disturbance to the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of disturbance and surface exposure that revealed the observed artifacts. In total, the surface is exposed over less than 5% of the site. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If a proposed range development project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

3.6 Clear Creek Butte, TFTA

Located in the northern portion of the TFTA (Figure 35) Clear Creek Butte is one of the dominant topographic features in the Tanana Flats (Figure 35). The butte is comprised of Birch Creek schist, and covered by a mantle of Fairbanks loess. It covers ~900 acres and rises ~140 m above the surrounding terrain to a maximum elevation of 266 masl. The butte is home to the Clear Creek Butte Arch District, which is comprised of five sites: FAI-00194, 00195, 00196, 00197 and 00198.

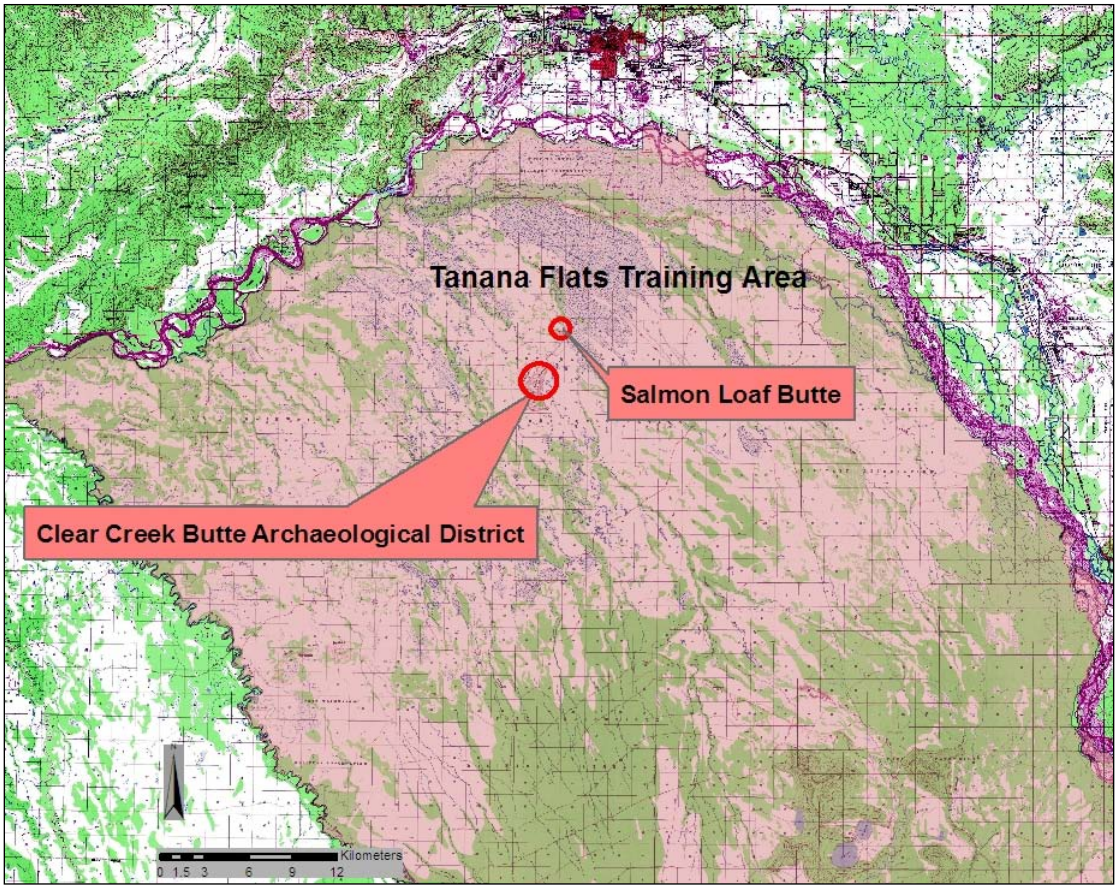

Figure 35. TFTA, Clear Creek Butte, and Salmon Loaf Butte

Section 110 fieldwork conducted during 2008 consisted of revisiting site FAI-00197, mapping the site, testing for subsurface materials, and recording the site's loess stratigraphy. Site FAI-00197 was originally discovered and reported by Dixon et al. (1980: 230-232; 320-321). At the time, these researchers discovered surface artifacts consisting of the following: four waste flakes; two end-scrapers; a possible Donnelly burin; a fragment of a possible semilunar biface; a possible basal fragment of a lanceolate projectile point; a microblade core; and four microblades. One 30 x 30 cm test pit was excavated, reportedly yielding one gray chert flake, a small fragment of schist and an end/side scraper from depths of 10-30 cm BS (Dixon et al. 1980: 230-231). The

site was recommended as eligible for inclusion into the NRHP (Dixon et al. 1980: 320-321. No site map or stratigraphic information was provided, and Dixon et al. (1980: 321) specifically calls for future work to determine this information.

Field Methods

On August 12, 2008, a crew of two Colorado State University, CEMML, archaeologists under the direct supervision of Edmund Gaines, M.A., R.P.A, revisited site FAI-00197. The crew mapped the site using compass and tape; made controlled surface collection of tool forms; and excavated two 50 cm x 50 cm excavation units to test for buried archaeological remains, determine vertical extent of cultural strata, and assess the underlying stratigraphy. All sediment was passed through ¼" mesh screen. The revealed stratigraphy was drawn, photographed and described. Due to time constraints, no attempt was made to determine the horizontal extent of buried cultural deposits.

FAI-00197

Determination of Eligibility: **Eligible**

Site FAI-00197 is located on the crest of the most northerly knob of Clear Creek Butte. The location provides a commanding view to the west, north and south. The area has been cleared for a helicopter landing zone. Surface visibility is estimated at greater than 80%. Vegetation in the cleared area is primarily willow, dwarf birch, and scattered grasses (Figure 40). Thick stands of aspen and birch cover the crest of the butte in the general vicinity.

Hundreds of pieces of flakestone debitage litter the surface in an area roughly 50 m x 75 m. Material types present include obsidian, tan rhyolite, gray chert, black chert, white chert, banded chert, and basalt. Formal and expedient tool forms collected from the surface include:

(1) Three projectile point fragments. The first of these (Figure 36) is a distal fragment of an obsidian lanceolate projectile point. The fragment measures 45.6 mm long, with a maximum width of 15.7 mm, and a maximum thickness of 5.5 mm. This well-crafted piece is completely covered by fine parallel pressure retouch. The obsidian has been sourced via XRF analysis to the Wiki Peak in the Wrangell Mountains located more than 300 km to the south (Appendix 1).

Figure 36. FAI-00197 fragmentary obsidian projectile point

The second artifact of this type is a rectangular basal fragment of a lanceolate projectile point measuring 18.8 mm long, 19.3 mm maximum width, and 5.8 mm maximum thickness. It is made of black (10YR 2/1) chert, with both faces exhibiting random to sub-parallel pressure retouch.

The third is a fragmentary side-notched projectile point made of light olive gray (5Y 6/2) chert. Both faces are entirely covered by random pressure retouch. It is missing its tip and one "ear" (Figure 37).

Figure 37. FAI-00197 side-notched projectile point

(2) Two bifaces. The first (Figure 38) of which is a complete projectile point perform made of gray (2.5Y 5/1) chert found in two refittable fragments. It measures 70.3 mm long, 30.3 mm maximum width, and is 6.8 mm maximum thickness. It exhibits percussion flaking scars with sub-parallel retouch covering ~30-40% of each face.

Figure 38. FAI-00197 biface

The second is a proximal fragment of a stage 3 biface made of gray (2.5Y 5/1) rhyolite with a heavy light reddish brown patina. The artifact consists of five refittable fragments, which when refitted measure 38.2 mm in length, 42.1 maximum width, and 9.6 maximum thickness.

(3) Microblade cores. Five microblade cores (e.g. Figure 39—three of five shown) were found on the surface. Attributes of the microblade cores are detailed in Table 4.

Figure 39. FAI-00197 surface microblade cores (A=FS 5; B=FS 6; C=FS 8)

(4) Microblades. Five fragmentary microblades were found on the surface. Attributes of microblades found on the surface are detailed in Table 2.

Two 50 cm x 50 cm test units were excavated at the site. Cultural remains were recovered from depths of 0-23 cm BS, with the densest concentration of material at 0-10 cm BS. Cultural material consists of lithic debitage and microblades. Depths, types and attributes of subsurface artifacts are detailed in Table 3 and Table 4.

Stratigraphy (Figure 41) revealed in the test units consists of aeolian silt roughly 30 cm thick with 10-20% angular schist gravels overlying a basal unit of very poorly sorted angular sand and decomposing schist bedrock up to 10-15 cm thick. Bedrock was typically encountered at 35-45 cm BS. Soil development consists of a very dark brown, charcoal-rich OA horizon roughly 3 cm thick overlying a dark brown organic rich AB horizon 3-4 cm thick. A reddish silt Btw horizon varies from 5-11 cm thick. The underlying silt is yellow and shows little evidence of pedogenesis other than a 3-5 cm thick discontinuous, dark red, clay and iron rich lamellae at roughly 20 cm BS.

Recommendations:
Dixon et al. (1980: 321) recommended the site as eligible for inclusion in NRHP. Site condition has evidently changed little since it was first identified 28 years ago. Clearing vegetation for a helicopter landing zone has resulted in a degree of erosion. This erosion is revealing artifacts across the surface of the cleared area; however, subsurface testing indicates that this disturbance is restricted to the surface of the site.

Site FAI-00197 is an intact archaeological site with demonstrated stratigraphic integrity. Buried cultural material recovered from an intact stratigraphic sequence indicates that FAI-00197 is in an excellent position to contribute to our knowledge of prehistoric land use patterns. *In situ* artifacts and intact stratigraphy indicate that if datable material is encountered, it could be used to date human use of the site, potentially contributing to a broader regional context. Although time constraints have thus far hindered determining the exact horizontal limits of the site, it is certainly as large as 70 m x 70 m, the area in which surface artifacts were observed. The site is eligible for inclusion in the NRHP under Criterion D for its potential to yield information important in understanding the prehistory of the region.

Table 1. FAI-00197 surface microblade core attributes

Field Specimen #	Core form	Blank type	Core length (mm)	Core height (mm)	Core thickness (mm)	Flute arc diam. (mm)	# of flutes	# of flute hinges	Platform length (mm)	platform width (mm)	Platform # of scars	Material type	Munsell code
5	wedge	flake	21.7	22.1	7.6	7.6	3	0	12.6	7.6	1	rhyolite	10YR 7/3
6	wedge	flake	13.5	18.5	7.9	7.8	3	0	12.1	7.8	>1	rhyolite	7.5YR 6/4
8	wedge	biface	28.6	24.7	11	11	5	1	9.4	10.2	>3	rhyolite	10YR 6/4
9	tabular	flake	16.4	23.5	9.4	9.4	6	2	13.9	9.2	>2	chert	2.5Y 2.5/1

Table 2. FAI-00197 surface microblade attributes

Field Specimen #	Length (mm)	Width (mm)	Thickness (mm)	# of arrises	Segment	Material Type	Munsell Code
3	21.0	6.7	2.7	1	proximal	chert	2.5Y 4/1
7	9.1	8.1	1.6	1	medial	chert	2.5Y 6/2
12	35.7	10.5	2.2	2	proximal	chert	2.5Y 2.5/1
13	15.4	4.3	0.9	2	proximal	chert	2.5Y 4/1
14	10.6	5.2	2.0	2	medial	rhyolite	10YR 7/3

Table 3. FAI-00197 subsurface lithic debitage

TP	Depth	Debitage Type	Size Class	Material Type	Munsell Code
2	0-5	broken flake	10-20 mm	chert	5Y 5/2
2	0-5	flake fragment	10-20 mm	chert	5Y 4/1
2	0-5	flake fragment	10-20 mm	basalt	5Y 4/1
2	0-5	debris	5-7.5 mm	rhyolite	10YR 6/3
2	0-5	broken flake	10-20 mm	chert	2.5Y 6/3 & 2.5Y 2.5/1
2	0-5	flake fragment	10-20 mm	chert	2.5Y 5/3
2	0-5	flake fragment	5-7.5 mm	rhyolite	10YR 6/4
2	0-5	debris	7.5-10 mm	chert	2.5Y 5/1
2	0-5	broken flake	10-20 mm	basalt	2.5Y 4/1
2	0-5	debris	5-7.5 mm	basalt	2.5Y 4/1
2	0-5	flake fragment	10-20 mm	basalt	2.5Y 4/1
2	0-5	flake fragment	10-20 mm	chert	2.5Y 4/1
2	0-5	flake fragment	7.5-10 mm	chert	2.5Y 2.5/1
2	0-5	flake fragment	10-20 mm	basalt	2.5Y 4/1
2	0-5	flake fragment	7.5-10 mm	chert	2.5Y 4/1 & 2.5Y 6/2
2	0-5	broken flake	7.5-10 mm	rhyolite	2.5Y 4/1
2	0-5	broken flake	7.5-10 mm	rhyolite	10YR 6/4
2	0-5	flake fragment	5-7.5 mm	chert	2.5Y 4/1
2	5-15	flake fragment	20-30 mm	chert	5Y 5/1
2	5-15	debris	20-30 mm	chert	5Y 3/1
2	5-15	complete flake	10-20 mm	chert	5Y 6/1
2	5-15	flake fragment	7.5-10 mm	chert	2.5Y 7/1
2	5-15	flake fragment	10-20 mm	chert	5Y 5/1
2	5-15	flake fragment	7.5-10 mm	chert	5Y 3/1
2	5-15	flake fragment	5-7.5 mm	chert	5Y 6/2
2	5-15	flake fragment	7.5-10 mm	rhyolite	10YR 6/3
2	5-15	flake fragment	10-20 mm	rhyolite	10YR 7/1
2	5-15	broken flake	10-20 mm	chert	2.5Y 5/1
2	5-15	broken flake	5-7.5 mm	chert	2.5Y 4/1
2	5-15	flake fragment	7.5-10 mm	chert	2.5Y 4/1
2	5-15	flake fragment	10-20 mm	chert	2.5Y 3/1
2	5-15	debris	10-20 mm	chert	2.5Y 4/1
2	5-15	flake fragment	10-20 mm	rhyolite	10YR 6/1
2	5-15	debris	10-20 mm	argillite	10YR 5/2
2	15-23	flake fragment	10-20 mm	chert	2.5Y 4/1
2	15-23	debris	10-20 mm	basalt	2.5Y 7/2
2	15-23	broken flake	7.5-10 mm	chert	2.5Y 4/1
2	15-23	flake fragment	7.5-10 mm	rhyolite	10YR 6/2
3	0-5	broken flake	10-20 mm	rhyolite	10YR 6/3

3	0-5	broken flake	10-20 mm	rhyolite	10YR 6/2
3	0-5	broken flake	7.5-10 mm	chert	10YR 7/2
3	5-10	flake fragment	10-20 mm	chert	2.5Y 3/1
3	5-10	debris	10-20 mm	chert	2.5Y 4/1
3	5-10	flake fragment	10-20 mm	chert	10R 3/3
3	5-10	flake fragment	10-20 mm	chert	2.5YR 5/4
3	5-10	flake fragment	10-20 mm	chert	5YR 5/4
3	5-10	flake fragment	7.5-10 mm	chert	5Y 7/1
3	5-10	flake fragment	10-20 mm	chert	5Y 6/2
3	5-10	debris	5-7.5 mm	basalt	5Y 2.5/1
3	5-10	flake fragment	7.5-10 mm	chert	2.5Y 6/1
3	5-10	flake fragment	10-20 mm	chert	2.5Y 8/2
3	5-10	debris	5-7.5 mm	rhyolite	2.5Y 7/2
3	5-10	debris	10-20 mm	UID	2.5YR 4/3
3	5-10	debris	10-20 mm	UID	2.5YR 4/3
3	5-10	flake fragment	7.5-10 mm	basalt	10YR 5/1
3	10-15	broken flake	20-30 mm	chert	2.5Y 4/1
3	10-15	broken flake	10-20 mm	chert	7.5YR 6/4
3	10-15	flake fragment	10-20 mm	chert	7.5YR 6/4
3	15+	flake fragment	7.5-10 mm	chert	2.5Y 3/1

Table 4. FAI-00197 subsurface microblade attributes

TP	Depth	Length (mm)	Width (mm)	Thickness (mm)	# of Arrises	Segment	Material Type	Munsell Code
2	0-5	19.5	6.2	2.1	1	proximal	rhyolite	2.5YR 3/4
3	0-5	17.9	5.3	2.5	1	proximal	chert	2.5Y 4/1
3	0-5	11.5	4.7	1.3	1	medial	rhyolite	10YR 6/3
3	0-5	7.7	7.1	1.3	2	medial	chert	5YR 3/1
3	5-10	9.5	4.0	0.8	1	proximal	chert	2.5YR 5/3
3	5-10	8.8	5.0	1.7	1	distal	chert	2.5Y 7/1
3	5-10	8.4	8.1	2.2	2	medial	chert	10YR 5/1
3	5-10	12.0	4.3	1.0	1	medial	chert	7.5YR 7/1
3	5-10	5.6	2.9	0.8	1	proximal	chert	2.5Y 3/1
3	5-10	8.7	4.6	0.9	1	proximal	chert	10YR 5/1
3	10-15	7.5	3.3	0.8	1	proximal	chert	7.5YR 7/1
3	15+	14.5	5.8	1.1	1	proximal	chert	2.5Y 4/1

Figure 40. FAI-00197 (view to east)

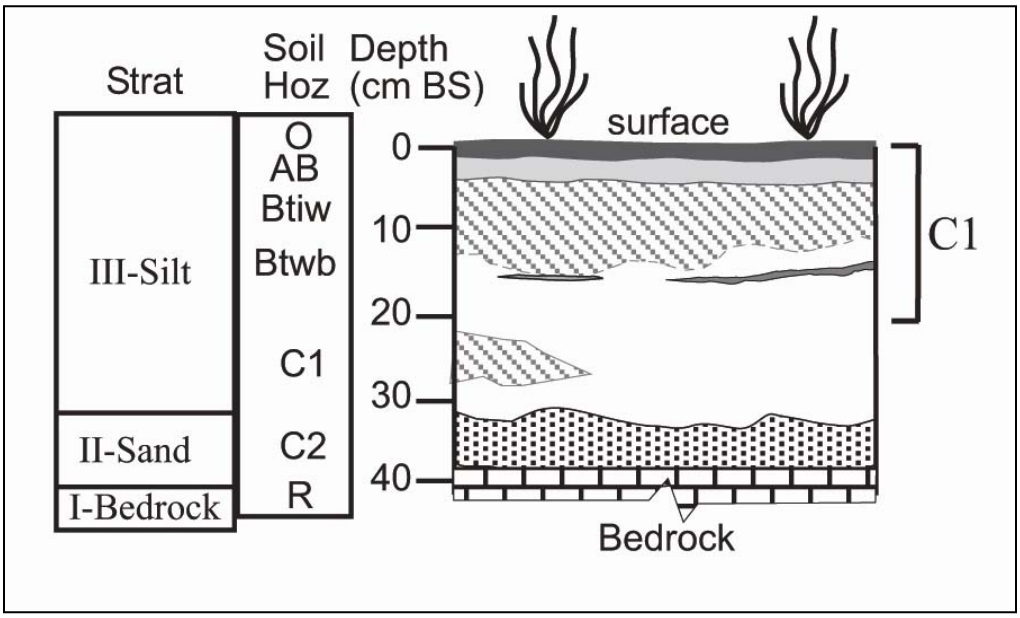

Figure 41. FAI-00197 stratigraphy

3.7 Salmon Loaf Butte, TFTA

Salmon Loaf Butte is a low hill situated on the west bank of Clear Creek, roughly 100 m west of the creek (Figure 35). It covers approximately 80 acres, rising 30 m above the surrounding terrain to an elevation of roughly 190 masl. The landform is composed of Precambrian-aged Birch Creek schist capped by a thin mantle of Fairbanks loess. Vegetation consists of a mixed hardwood-needleleaf forest with an understory of grasses and forbs. Other than Clear Creek Butte, located 2.6 km to the southwest, it is the only topographic feature in what is characterized as a generally flat landscape. Vantage points along crest of the landform provide exceptional views of the surrounding terrain.

Section 110 field work conducted at Salmon Loaf Butte during the summer of 2008 consisted of evaluations of site FAI-01357 to determine eligibility for inclusion in the NRHP, and new survey of an additional 40 acres along the crest of the butte.

Field Methods

On August 13, 2008, a crew of two CEMML, archaeologists under the direct supervision of Edmund Gaines, M.A., R.P.A, conducted archaeological investigations of Salmon Loaf Butte. Site FAI-01357 was mapped using compass and tape and photographed with digital cameras. The crew excavated one 50 cm x 50 cm excavation unit to test for buried archaeological remains, determine vertical extent of cultural strata, and assess the underlying stratigraphy. All sediment was passed through ¼" mesh screen. The revealed stratigraphy was drawn, photographed and described. Due to time constraints, no attempt was made to determine the site boundary or horizontal extent of cultural deposits.

Visual survey coverage consisted of parallel pedestrian transects spaced at 10-20 m walked along the entire crest of the knoll.

Results

Site FAI-01357 yielded buried archaeological remains in an intact stratigraphic sequence. The site is intact, has demonstrated integrity, and was determined eligible for inclusion in the NRHP. Survey efforts identified two new prehistoric archaeological sites, FAI-01888 and FAI-01889, on the crest of the bluff.

FAI-01357

Determination of Eligibility: Eligible

Site FAI-01357 was originally identified by Steve Lanford of the Bureau of Land Management during 2001. The site is located in a roughly 70 m x 70 m cleared area—a man-made opening in the aspens covering the top of the knoll created for a helicopter landing zone—on the eastern aspect of Salmon Loaf Butte. Slope in the site area varies between 3-8%. The eastern margin of the landform drops steeply 30 m to the flats below providing a commanding view of Clear Creek and the Tanana flats to the east. The ecotype is characterized as upland low disturbed flora. Site

vegetation consists of wild rose, low-bush cranberry, red currants, fireweed, grasses and forbs (Figure 43). The elevation is 184 masl.

Lanford identified the site in 2001 on the basis of numerous flakes on the surface of the cleared helicopter landing zone. Tool forms identified in 2001 include an endscraper, a large uniface, a retouched flake and a lanceolate projectile point basal fragment.

During 2008 we confirmed Lanford's report by finding several dozen pieces of flakestone diffusely scattered across the entire cleared area. Material types observed include rhyolite, grey chert, black chert, banded chert, obsidian, and fine-grained black basalt. All of the observed flakes were tertiary reduction flakes with minimal cortex. A single flake of obsidian was observed and collected. XRF analysis indicates the raw material is from the Wiki Peak source in the Wrangell Mountains located more than 300 km to the south. Observed formal and expedient tool forms at the site include:

(1) One complete biface, likely a failed projectile point perform, found in two re-fittable fragments (Figure 42). The complete biface is 58.2 mm long, with a maximum width of 21.4 mm, and a maximum thickness of 10.1 mm.

Figure 42. FAI-01357 biface

(2) One fragmentary uniface made of gray (2.5Y 5/1) chert. The artifact is at least 39.1 mm long, 36.5 mm wide, with a maximum thickness of 6.5 mm. It has very steep, sub-parallel retouch on its distal edge, and one margin. Retouched edge length is 35.1 mm (distal), and 36.4 mm (margin).

(3) One retouched basalt flake. It is a flake fragment, oval in shape, between 30-40 mm diameter, with random sub-parallel unifacial pressure flaking evident along 43.7 mm of one margin.

(4) One retouched flake made of light gray (5Y7/1), very vitreous quartzite. It is between 20-30 mm in diameter, triangular in shape, with sub-parallel pressure retouch along one 19.1 mm of one margin.

The site is generally in good condition, although there is evidence of moderate disturbance. The area was originally cleared for use as a helicopter landing zone by cutting the aspen near ground level with a chainsaw and then skimming with a bulldozer. Observed evidence of military training activities includes grenade fuses and handles, and spent 5.56 mm and 7.62 mm cartridges. Two foxholes have been excavated, which are now filled with sandbags. One large sandbag bunker, which is now flattened or bulldozed, was erected in the eastern portion of the site. The sandbags are split, spilling alluvial sands and river cobbles on the site surface, potentially adding confusion to the site as intrusive materials. In addition, there is a trail near the site that was opened via bulldozer.

One test pit was excavated at the site during 2008, revealing an intact stratigraphic sequence and yielding buried archaeological remains from two components (Table 5; Figure 44). Twenty-one flakes were found at depths of 0-20 cm BS (Figure 44: C1), and one flake was recovered from 40-50 cm BS (Figure 44: C2). Stratigraphy consists of yellowish aeolian silts (loess) 60 cm thick, punctuated by a thin, well-sorted light brown fine sand layer at 53-58 cm below the surface. The lower silt layer beginning at 58 cm BS disconformably overlies birch creek schist bedrock at 60 cm BS. Soil development consists of dark brown silt OA horizon at 0-4 cm BS, and a reddish silt Bti horizon at 4-10 cm BS. A dark red, clay and iron-rich lamellae (Btwb1), 1-3 cm thick was encountered at 15-17 cm BS. The upper artifacts occur above the lamellae, while the lower component is just above the lower sand layer.

Recommendations

Site FAI-001357 is an intact archaeological site with demonstrated stratigraphic integrity. Disturbance resulting from clearing for a helicopter landing zone is restricted to the surface of the site. Subsurface disturbance from foxhole and bunker construction has affected less than 1% of the site area. Buried cultural material recovered from an undisturbed stratigraphic sequence indicates that FAI-01357 is in an excellent position to contribute to our knowledge of prehistoric land use patterns. *In situ* artifacts and intact stratigraphy indicate that if datable material is encountered, it could be used to date human use of the site, potentially contributing to a broader regional context. Although time constraints have thus far hindered determining the exact horizontal limits of the site, it is certainly as large as 70 m x 70 m, the area in which surface artifacts were observed. The site is eligible for inclusion in the NRHP under Criterion D for its potential to yield information important in understanding the prehistory of the region.

Table 5. FAI-01357 test pit one cultural material

Depth	Flake Type	Size Class	Material Type	Munsell code
0-10	broken flake	10-20 mm	rhyolite	5YR 5/6
0-10	broken flake	10-20 mm	rhyolite	7.5YR 4/2
0-10	complete flake	10-20 mm	rhyolite	7.5YR 5/4
0-10	debris	7.5-10 mm	rhyolite	10YR 5/4
0-10	broken flake	5-7.5 mm	rhyolite	7.5YR 6/3
0-10	flake fragment	7.5-10 mm	rhyolite	5YR 6/4
0-10	flake fragment	5-7.5 mm	chert	2.5Y 2.5/1
0-10	flake fragment	7.5-10 mm	chert	2.5Y 4/1
0-10	flake fragment	10-20 mm	chert	5Y 3/1
0-10	flake fragment	10-20 mm	chert	2.5Y 2.5/1
0-10	flake fragment	10-20 mm	chert	2.5Y 2.5/1
0-10	flake fragment	7.5-10 mm	basalt	2.5Y 2.5/1
0-10	flake fragment	7.5-10 mm	chert	2.5Y 4/1
0-10	broken flake	10-20 mm	chert	10YR 3/1
0-10	flake fragment	10-20 mm	chert	10YR 3/1
0-10	flake fragment	10-20 mm	basalt	2.5Y 2.5/1
0-10	complete flake	10-20 mm	basalt	2.5Y 2.5/1
10-20	debris	7.5-10 mm	basalt	10YR 4/1
10-20	flake fragment	7.5-10 mm	rhyolite	7.5YR 6/4
10-20	flake fragment	7.5-10 mm	obsidian	NA
10-20	broken flake	7.5-10 mm	rhyolite	10YR 6/3
40-50	flake fragment	10-20 mm	rhyolite	10YR 5/3

Figure 43. Site FAI-01357 (view to east)

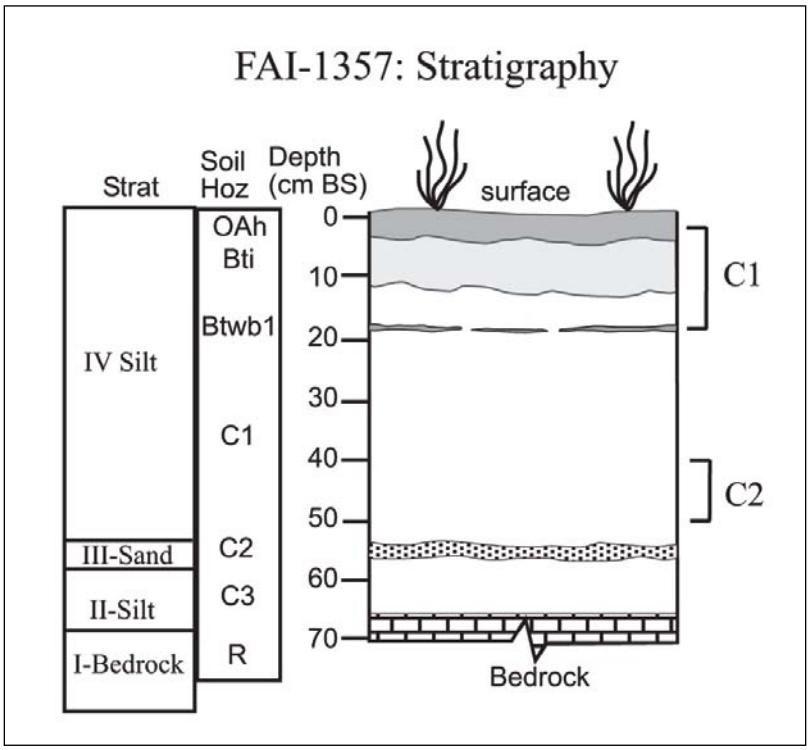

Figure 44. FAI-01357 Stratigraphy

FAI-01888
Determination of Eligibility: Not evaluated
FAI-01888 is located on the southern edge of Salmon Loaf Butte, roughly 500 m west of Clear Creek. The site is located along a trail that extends east-west along the crest of the butte. Surface visibility—limited to areas disturbed by the trail—is estimated at less than 5%. Site slope is 0-10%. Roughly 50 m to the south the landform drops steeply 30 m to the flats below; the slope 50 m to the north is much more gradual in its descent to the flats. This vantage point would provide a prominent view to both the north and south; however, the view shed is obscured by thick tree cover. Site vegetation consists of aspen, white spruce and birch, with a thick understory of low-bush cranberry, wild rose, grasses and forbs and some dwarf scrub (Figure 45). The elevation is 181 masl.

FAI-01888 was identified on the basis of a single flake of reddish chert found on the surface. Due to time constraints, no subsurface testing was conducted; however there is a high potential for buried remains. Intact deposits of aeolian silt blanket the entire site area. Disturbance, in the form of a modern hunting camp, and a narrow trail, is minimal, affecting less than 10% of the estimated area of the site. None of this disturbance appears to extend for any appreciable depth into the underlying silt.

Site condition is generally good. There is some evidence of military training activities in the form of small unidentifiable metal fragments, and discarded segments of communication wire. Additional evidence of recent use of the area includes three saw-cut lower moose legs. Skin and hair still adhering to these elements indicate that the kill occurred less than one year ago.
The site is on the same landform as site FAI-1357, which is located 365 m to the east, and site FAI-1889, which is roughly 100 m to the west. The entire landform, Salmon Loaf Butte, would have made an ideal hunting lookout and camp location for prehistoric peoples. All of the sites identified on Salmon Loaf Butte were identified by artifacts found in areas disturbed by the trail. We strongly suspect that buried artifacts occur throughout the extent of Salmon Loaf Butte, and that the boundaries of sites FAI-1357, FAI-1888, and FAI-1889 overlap, comprising one large, extensive prehistoric site, with multiple loci.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of disturbance and surface exposure that revealed the observed artifacts. In total, the surface is exposed over less than 5% of the site. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If a proposed range development project entails impacts to the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 45. Site FAI-10888 (view to west)

FAI-01889
Determination of Eligibility: Not evaluated

FAI-01889 is located in the central portions of the TFTA. The site is located on along a trail that extends east-west along the crest of a small butte and terminates in the vicinity of the site. Surface visibility—limited to areas disturbed by the trail—is estimated at less than 10%. Site slope is 0-10%. The landform drops steeply at a 60-70% slope to both the north and south; the slope to the west is very gradual (20-30%) as it drops roughly 25 m to the flats below. This vantage point provides a 270º view shed with excellent views to the north, south and west; Clear Creek Buttes and Wood River Buttes are visible to the west. The southern slope is comprised of an extensive (100 m x 150 m) talus slope. Site vegetation consists of aspen, white spruce and birch, with a thick understory of low-bush cranberry, wild rose, grasses and forbs and some dwarf scrub. Site elevation is 168 masl.

FAI-01889 was identified on the basis of seven flakes, and two pieces of calcined bone found on the surface in areas disturbed by the trail. With the exception of one microblade medial fragment made of black chert, all of the lithic artifacts are tertiary debitage and late-stage bifacial thinning flakes. In addition to black chert, material types include tan rhyolite, gray chert, and white chert. Recent military use of the site is evidenced by several 5.56 mm (.223 cal) brass cartridge casings, and plastic trash from MREs, and a Miller® beer bottle cap.

No shovel tests were excavated; however there is a high potential for buried remains. Intact deposits of aeolian silt blanket the entire site area. Disturbance, in the form of a low, re-vegetated berm on the southern edge of the site, and a narrow trail, is minimal, affecting less than

20% of the estimated site area. None of this disturbance extends for any appreciable depth into the underlying silt.

The site is on the same landform as site FAI-1357 and site FAI-1888. The entire landform would have made an ideal hunting lookout and camp location for prehistoric peoples. All of the sites identified on the butte were identified by artifacts found in disturbed areas. It is likely that buried artifacts occur throughout the extent of the landform, and that sites FAI-1357, FAI-1888, and FAI-1889 actually comprise one large, extensive prehistoric site, with multiple loci.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of disturbance and surface exposure that revealed the observed artifacts. In total, the surface is exposed over less than 5% of the site. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If a proposed range development project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 46. Site FAI-01189 (view to east)

Figure 47. Talus on southwest slope of the butte (view to north)

3.8 Donnelly Training Area (DTA)

The DTA consists of 623,895 acres located in the upper Tanana River valley, near the town of Delta Junction. The southern portion of the DTA is in the northern foothills of the Alaska Range section of the Alaska Aleutian province (Wahrharftig 1965). Topographically, the southern portion of the DTA steadily rises to glaciated highlands that grade into the foothills of the Alaska Range. The northern portion of the DTA is within the Tanana-Kuskokwim Lowland section of the Western Alaska physiographic province (Wahrharftig 1965). This area gradually drops in elevation to lowlands associated with tributaries of the Tanana River. The major drainages in the DTA are Jarvis Creek, Granite Creek, the Delta River, the Little Delta River, and Delta Creek. DTA ecosystems are characterized as moist to wet broadleaf and needleleaf forests, moist to dry dwarf and low scrub, and fen meadows (Jorgensen et al. 1999).

The DTA landscape is the product of several successions of late Pleistocene glaciations that advanced northward from the Alaska Range, with each advance successively less in extent than the previous (Péwé 1975; Péwé and Reger 1983). Delta Glaciation, which is either early Wisconsin or late Illinoisan in age, consisted of at least two advances that resulted in broad terminal moraines that arc across the middle Tanana Valley up to 50 km beyond the front of the Alaska Range. Delta-age moraines generally occur in the central and eastern portions of the district in the vicinity of Jarvis Creek. The more recent Donnelly Glaciation, which dates to late Wisconsin times between 25,000 to 9,000 BP, was less extensive than the preceding Delta Glaciation. The Donnelly advance produced terminal moraines that extend up to 25 km from the front of the Alaska Range and occur in the western portion of the proposed district. The kame-and-kettle terrain resulting from these glacial advances consists of a series of low hills, knolls and ridges with crests that range from 500 to 655 masl, interspersed with hollows, draws and topographic depressions containing marshy areas and small lakes.

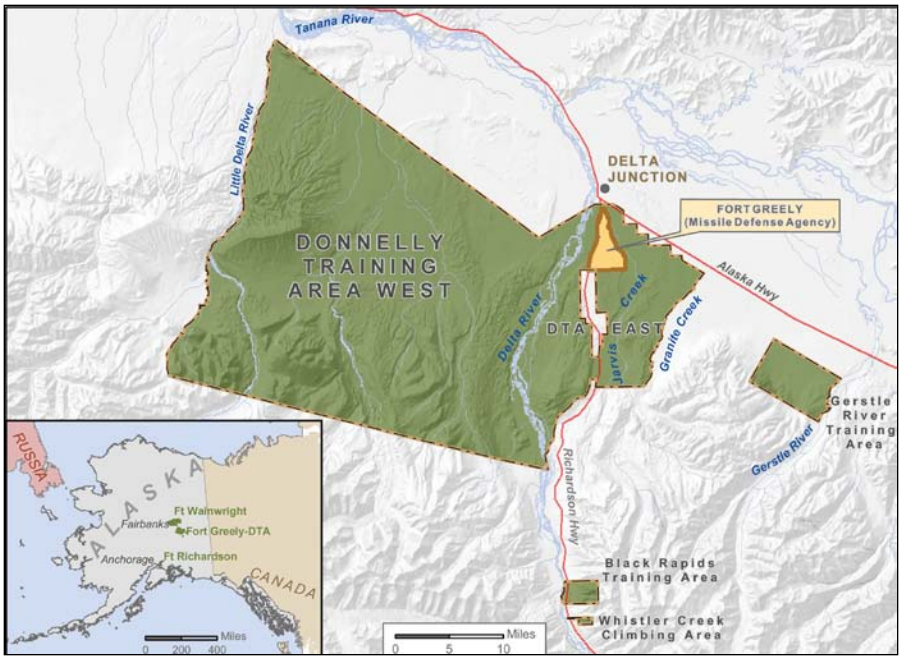

Figure 48. Donnelly Training Area (DTA)

Archaeological research on DTA has resulted in numerous technical reports (Bacon 1978; Bacon and Holmes; Goodman et al. 2002; Hedman et al. 2003; Higgs et al. 1999; Holmes 1979; Potter 2005; Rabich and Reger 1978; Raymond-Yakoubian and Robertson 2005b; Robertson et al. 2004; Staley 1993), scientific papers (Holmes and Anderson 1986; West 1967, 1975) and the identification of over 435 archaeological sites. The majority of these sites are located in DTA East where large systematic surveys have been ongoing since 2002 (Hedman et al. 2003; Raymond-Yakoubian and Robertson 2005b; Robertson et al. 2004). Work in DTA West has been limited by access and safety issues and has generally focused on recorded sites and areas thought to be of very highest potential for containing archaeological sites.

3.9 Maneuverability and Mobility Enhancement Tail Network Upgrade, DTA

USAG FWA proposes to increase access and maneuverability for mechanized vehicles by upgrading the existing trail network at Fort Wainwright (FWA), Donnelly Training Area (DTA) East. The objectives of this project are: (1) to support sustainable Stryker, and other military vehicle use; (2) to provide a primary artery to support two-way Stryker traffic; and (3) to establish an all-season crossing of Jarvis Creek within DTA East.

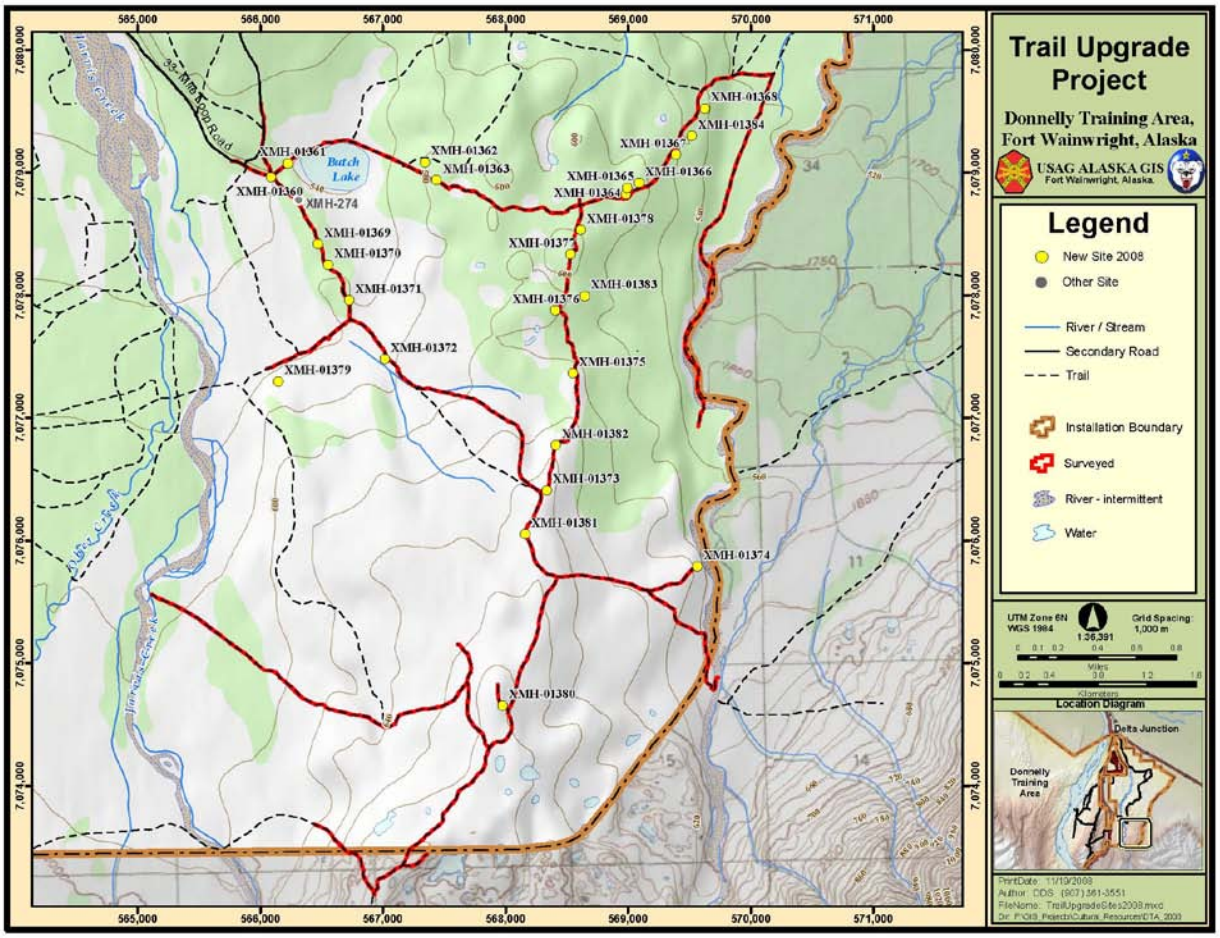

Figure 49. Location of DTA Tail Network Upgrade project area

The proposed project consists of upgrades to roughly 100 miles (161 km) of existing trails. The APE includes a 92 foot buffer (46 feet on either side of trail centerline). More than 80 miles (129 km) of project trails have been previously surveyed between 2002 and 2006 as part of CEMML's ongoing Cultural Resources Management program (Hedman et al. 2003; Robertson et al. 2004; 2005; 2006) (Figure 9). Survey efforts during 2008 focused on 20 miles (32 km) of previously un-surveyed trails in DTA Granite Training Range found on USGS Mt. Hayes C-4 topographic map: SEC2-5 & 9, T13S, R11E; and SEC25 & 30-34, T12S, R11E, of the Fairbanks Meridian.

Project Setting and Environment
The DTA Granite Training Range is bounded to the west by Jarvis Creek and to the east by Granite Creek. This area is located at the transition of the Tanana-Kuskokwim Lowland section of the Western Alaska physiographic province and the northern foothills of the Alaska Range section of the Alaska Aleutian province (Wahrharftig 1965). The southern portion of the range steadily rises to the foothills of the Granite Mountains, while the northern areas gradually drop in elevation to the Jarvis Creek lowlands. The project area landscape is composed of moraines and kettle lakes formed during late Pleistocene glaciations. This terrain consists of a series of low hills, knolls and ridges with crests that range from 545-655 masl, interspersed with hollows, draws and topographic depressions containing marshy areas and small lakes.

Ridge crests and hill tops in the project area generally exhibit an upland low and high scrub ecotype, while lowland areas are moist scrub, tussock-sedge meadows and/or tussock-scrub bogs (Jorgensen et al. 1999). A forest fire raged through the region in 1999. Charred remains of spruce trees are dispersed throughout most of the project area. Many of the hilltops exhibit aeolian erosion resulting from reduced surface vegetation due to fire disturbance. Rebound vegetation consists of patches of alder and scattered stands of low broadleaf trees that are primarily found in the eastern portion of the project area. Isolated needleleaf stands that survived the fire episode occur in Granite Creek floodplain, as well as the higher ridges in the extreme southern portion of the training area.

Survey Methodology
In June and early July 2008, a four-person field crew employed by Colorado State University, CEMML, under the direction of Edmund Gaines, M.A., R.P.A., surveyed the proposed trail upgrade project area.

In preparation for fieldwork, we reviewed topographic maps, detailed aerial photos, and available sources of historical, archaeological, geologic and ecological information pertinent to the project area. The Alaska Heritage Resource Survey (AHRS) database provided information on known cultural resources in the project area. Based on this research we determined that one previously recorded prehistoric archaeological site—XMH-274 (Holmes 1979)—was located within the APE, and that there was high potential for additional cultural resources.

The project area was accessed by All Terrain Vehicles (ATVs). While in the field, the location and extent of the APE was determined based upon the location of existing trails. Survey coverage was restricted solely to include only the APE as determined by the location of these existing trails.

Survey and site discovery methods consisted of both pedestrian survey and subsurface testing. Visual survey coverage included 100% of the APE. Parallel pedestrian transects were spaced at 10-20 m. Discretionary subsurface testing was conducted in areas of higher site potential, including, but not limited to, knolls, ridges and lake margins. Shovel tests were approximately 40 cm x 40 cm and were screened through ¼” mesh.

Cultural Resources
Survey conducted during 2008 resulted in the identification of 25 prehistoric archaeological sites; with XMH-274—the site previously recorded by Holmes (1979)—a total of 26 prehistoric sites occur directly within the project APE. Prior to beginning construction on the proposed trails upgrade project all of these sites must undergo a Phase II archaeological evaluation to determine their eligibility for inclusion to the NRHP. If the proposed project will impact sites found eligible for inclusion to the NRHP, a strategy to mitigate the adverse effects of construction must be implemented.

XMH-00274
Determination of Eligibility: **Not evaluated**

Originally reported by C.E. Holmes (1979), site XMH-00274 was relocated as part of our survey efforts during 2008. The site is located on the western edge of a north-south trending terrace, on a trail directly within the project APE. The western margin of the landform drops steeply 15 m to the valley below, providing a commanding view of Jarvis Creek and the alluvial plain to the west. The main north-south thoroughfare of the project area runs through the site and surface visibility—limited to areas disturbed by the trail and a roughly 10 m x 10 m area devoid of surface cover—is estimated at 20% Site vegetation consists of dwarf birch, low-bush cranberry, Labrador tea and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 549 masl.

Holmes (1979) reports 25 pieces of flakestone debris eroding out of the roadbed at XMH-274. During the 2008 field season we confirmed the site's location by finding a single gray chert flake exposed in the roadbed at the reported site coordinates. The lack of additional artifacts indicates a degree of site destruction subsequent to Holmes' initial discovery. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 20% of the site is estimated to have been disturbed. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If the proposed project entails impact to the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 50. XMH-00274 overview (view to northwest)

XMH-01360
Determination of Eligibility: Not evaluated

XMH-01360 is located on a low northeast-southwest trending bench that overlooks a large lake, which is roughly 300-350 m away, and Jarvis creek to the west. The site is located adjacent to a trail junction, and the main north-south thoroughfare of the project area runs through its boundaries. Surface visibility—limited to areas disturbed by the trail—is estimated at 10%. The view shed at the site is roughly 270º with open views to the south, west and east: Donnelly Dome is visible to the southwest; the Granite Mountains are to the south; and the Alaska Range is to the southwest. A hill obscures the view to the north. Site vegetation consists of dwarf birch, low-bush cranberry and some dwarf scrub. The ecotype is characterized as upland wet low scrub. The elevation is 530 masl.

XMH-01360 was found through pedestrian survey of the project area APE. The site consists of at least 20 flakes exposed in the road bed for a distance of at least 65 m. Most (n=16) of the flakes are tertiary bifacial-thinning flakes of grey chert. A small basalt pressure flake, and a tertiary quartz flake were also noted. Two unifacial tools were collected: a grey chert scraper (Figure 52), and a rhyolite retouched flake. No shovel tests were excavated.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 5% of the site is estimated to have been disturbed. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If the proposed project entails impact to the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 51. XMH-01360 overview (view to east)

Figure 52. XMH-1360 scraper

XMH-01361
Determination of Eligibility: Not evaluated

XMH-01361 is located on a low (2-3 m high) east-west trending bench roughly 100 m to the northeast of Butch Lake. The site is situated 50 m north of the Butch Lake outlet. Surface visibility—limited to disturbed areas where a project trail crosses the site—is estimated at 10%. The view shed is roughly 270º with open views to the south, west and east: Donnelly Dome is visible to the southwest; the Granite Mountains are to the south; and the Alaska Range is to the southwest. A hill obscures the view to the north. Site vegetation consists of dwarf birch, low-bush cranberry and dwarf scrub. The ecotype is characterized as upland wet low scrub. The elevation is 547 masl.

XMH-01361 was found through pedestrian survey of the project area APE. The site consists of at least four artifacts—three gray chert tertiary flakes, and one chi-tho made of granitic material—found on the surface, exposed in the trail bed along a distance of at least 40 m. No shovel tests were conducted.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of trail disturbance and surface exposure that revealed the observed artifacts. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If the proposed project entails impacts to the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 53. XMH-01361 overview (view to south)

XMH-01362
Determination of Eligibility: Not evaluated

XMH-01362 is located on a small (roughly 50 m north-south and 10 m east-west) knoll on the edge of a prominent north-south running moraine—the same moraine as XMH-01363, which is located 105 m to the northeast. The moraine drops steeply to the west to the valley floor, roughly 20 m below. The knoll rises 2 m above the moraine, providing a commanding 360º view of the surrounding terrain: a large lake is 400 m to the west; Donnelly Dome is visible to the west; the Granite Mountains are due south; and upland moraines are visible to the north. Surface visibility is estimated at 70%. Site vegetation consists of dwarf birch, low-bush cranberry, dwarf scrub, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 576 masl.

XMH-01362 was found through pedestrian survey of the project area APE. The site consists of a single bifacial-thinning flake of banded chert found on the surface in an exposed area east of the crest of the knoll. No shovel tests were conducted.

Recommendations:
The site has been initially classified as an isolated find; however, it could potentially contain additional cultural material that could contribute important information to our understanding of the prehistory of the region. If the proposed undertaking will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 54. XMH-01362 overview (view to north)

XMH-01363
Determination of Eligibility: Not evaluated

XMH-01363 is located on a bench on a prominent north-south running moraine--the same landform as XMH-01362, which is located 105 m to the southwest. The bench quickly drops 2-3 m to the west, levels out, then drops another 8 m to the valley floor below, providing a 270º view shed with open views to the north, east and south: a large lake is roughly 450 m to the west; Donnelly Dome is also visible to the west; the Granite Mountains are to the south; and upland moraines are visible to the north. Surface visibility—generally limited to disturbed areas where a project trail crosses the site and a 20 m x 15 m area devoid of surface cover— is estimated at 40%.

Site vegetation consists of dwarf birch, low-bush cranberry, dwarf scrub, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 577 masl.

XMH-01363 was found through pedestrian survey of the project area APE. The site consists of a single tertiary flake of purple-gray chert found on the surface. No shovel tests were conducted.

Recommendations:
The site has been initially classified as an isolated find; however, it could potentially contain additional cultural material that could contribute important information to our understanding of the prehistory of the region. If the proposed undertaking will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 55. XMH-01363 overview (view to west)

XMH-01364
Determination of Eligibility: Not evaluated

XMH-01364 is located on 100 m x 40 m northeast trending ridge— the same landform as XMH-01635, which is located 60 m to the north. The location provides 360º view of the surrounding terrain: Donnelly Dome is visible to the southwest; the Granite Mountains are to the south; and upland moraines are visible to the north. The site has an especially commanding view of the lowland valley floor to the east. The nearest water is a small unnamed lake roughly 350 m due north. Surface visibility is estimated at 80%. Site vegetation consists of low birch trees, dwarf birch, scattered low-bush cranberry, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 592 masl.

XMH-01364 was found through pedestrian survey of the project area APE. The site consists of a two tertiary flakes of gray chert found on the surface. No shovel tests were conducted.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it could potentially contain additional cultural material that could contribute important information to our understanding of the prehistory of the region. If the proposed undertaking will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 56. XMH-01364 overview (view to southwest)

XMH-01365
Determination of Eligibility: Not evaluated

XMH-01365 is located on 100 m x 40 m northeast trending ridge—the same landform as XMH-01634, which is 60 m to the south. The location provides a commanding 360º view of the surrounding terrain: Donnelly Dome is visible to the southwest; the Granite Mountains are to the south; upland moraines are visible to the north. The site also has a particularly commanding view of the lowland valley floor to the east. The nearest water is a small unnamed lake 350 m to the north. Surface visibility is estimated at 80%. Site vegetation consists of low birch trees, dwarf birch, scattered low-bush cranberry, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. Site elevation is 592 masl.

XMH-01365 was found through pedestrian survey of the project area APE. A single fragmentary biface, found in two pieces exposed on the surface (Figure 58), was collected from the site. The artifact is an early stage biface made of dark gray and light yellowish brown (10YR 4/1 and 6/4), igneous rock. It measures 112.4 mm long, 77.1 mm maximum width, and 12.8 mm maximum thickness.

No other artifacts were observed. No shovel tests were conducted.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it could potentially contain additional cultural material that could contribute important information to our understanding of the prehistory of the region. If the proposed undertaking will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 57. XMH-01365 overview (view to east)

Figure 58. XMH-01365 Fragmentary biface

XMH-01366
Determination of Eligibility: Not evaluated

XMH-01366 is located on a small knoll roughly 75 m in diameter. The location provides 360º viewshed: Donnelly Dome is visible to the southwest; the Granite Mountains are to the south; the upland moraines of Muskeg Hill are visible to the north. The site also has a particularly commanding view of the lowland valley floor to the south and east. The nearest water is a small unnamed lake roughly 525 m to the north. Surface visibility is estimated at 80%. Site vegetation consists of low birch trees, low alders, dwarf birch, low-bush cranberry, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 591 masl.

XMH-01366 was found through pedestrian survey of the project area APE. The site consists of two gray chert tertiary flakes found on the surface in exposures near the crest of the hill. No shovel tests were conducted.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it could potentially contain additional cultural material that could contribute important information to our understanding of the prehistory of the region. If the proposed undertaking will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 59. XMH-01366 overview (view to north)

XMH-01367
Determination of Eligibility: Not evaluated

XMH-01367 is located on a small knoll that extends roughly 80 m east-west and 50 m north-south. The landform drops roughly 3 m to the north to the basin of a small lake, which is located roughly 100 m away. The hill slope drops 30 m to the valley floor to the south. The location provides a commanding 180º view shed of the lowland valley floor to the south and east. Low ridges and moraines surrounding the small lake obscure the view to the north. The only visible landmarks are the Granite Mountains to the south. Surface exposure is minimal and surface visibility is estimated at less than 10%. Site vegetation consists of small black spruce, low birch trees, dwarf birch, low-bush cranberry, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 568 masl.

XMH-01367 was found through pedestrian survey of the project area APE. The site consists of two artifacts found on the surface separated by roughly 60 m. The first of these is a small banded gray chert pressure flake. The second artifact is a complete black basalt side-notched projectile point (Figure 61) of the type commonly associated with Northern Archaic assemblages. It measures 53.3 mm long, 25.8 mm maximum width, and 8.0 mm maximum thickness.

No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 5% of the site is estimated to have been disturbed. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 60. XMH-01367 overview (view to south)

Figure 61. XMH-10367 side-notched projectile point

XMH-01368
Determination of Eligibility: Not evaluated

XMH-01368 is on the wide, flat crest of a prominent knoll that is located on the eastern edge of a large north- south trending moraine. The location affords a 180º view of the terrain to the east, south and west: Mt. Hayes is visible to the southwest; and the Granite Mountains are to the south. The eastern end of the landform terminates in a conspicuous point, and then steeply drops roughly 50 m to the valley floor, providing an especially commanding view of the terrain to the east. Roughly 30% of the site's surface is exposed—where the trail crosses the site, and in a 15 m x 15 m area devoid of surface cover. Site vegetation consists of low birch trees, dwarf birch, low-bush cranberry, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 557 masl.

XMH-01368 was found through pedestrian survey of the project area APE. The site consists of 10 surface artifacts found scattered over a roughly 15 m x 10 m area. These include: four black chert pressure flakes; three fine-grained tan rhyolite bifacial thinning flakes; and a single tan rhyolite fragmentary scraper found in three pieces and collected (Figure 63). No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 15% of the site is estimated to have been disturbed. The landform contains apparently intact stratigraphic deposits underscoring the possibility for buried remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 62. XMH-01368 overview (view to east)

Figure 63. XMH-01368 fragmentary scraper

XMH-01369
Determination of Eligibility: Not evaluated

XMH-01369 is located on the western edge of a north-south trending terrace—the same landform as XMH-01370, which is roughly 200 m to the south. The location affords a 180º view of the terrain to the west, south and north. Donnelly Dome is visible to the southwest; the Granite Mountains are to the south, and Butch Lake is roughly 400 m away to the northeast. The western margin of the landform drops steeply 15 m to the valley below, providing a commanding view of Jarvis Creek and the alluvial plain to the west. The main north-south thoroughfare of the project area runs through the site, and surface visibility—limited to areas disturbed x the trail—is estimated at 5%. Site vegetation consists of dwarf birch, low-bush cranberry, Labrador tea and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 564 masl.

XMH-01369 was found through pedestrian survey of the project area APE. The site consists of six surface artifacts found scattered along a 10 m length of trail. These include: one tertiary yellow and red chert flake that exhibits a waxy appearance characteristic of heat-treatment; a single gray and red chert bifacial thinning flake that exhibits heat-spalling and crazing; and a single black basalt fragmentary scraper found in two pieces and collected (Figure 65). No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 5% of the site is estimated to have been disturbed. The landform contains apparently intact

stratigraphic deposits underscoring the possibility for buried remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 64. XMH-01369 overview (view to west)

Figure 65. XMH-01369 fragmentary scraper

XMH-01370
Determination of Eligibility: Not evaluated

XMH-01370 is located on a high spot on the western edge of a north-south trending terrace edge—the same landform as XMH-01369. The location affords a 180º view of the terrain to the west, south and north. Donnelly Dome is visible to the southwest; the Granite Mountains are due south, and a large lake is roughly 500 m to the northeast. The western margin of the landform drops steeply 15 m to the valley below, providing a commanding view of Jarvis Creek and the

alluvial plain to the west. The main north-south thoroughfare of the project area runs through the site. Surface visibility—limited to areas disturbed by the trail, and a 10 x 10 m area devoid of cover—is estimated at 15%. Site vegetation consists of dwarf birch, low-bush cranberry, low scrub, Labrador tea and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 559 masl.

XMH-01370 was found through pedestrian survey of the project area APE. The site consists of a single basalt bifacial-thinning flake found on the surface of the trail. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 15% of the site is estimated to have been disturbed. The landform contains extensive silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 66. XMH-01370 overview (view to north)

XMH-01371
Determination of Eligibility: Not evaluated

XMH-01371 is located on a small (roughly 25 m x 30 m) knoll on the western edge of a north-south trending terrace edge—the same landform as XMH-01370, which is located roughly 330 m to the north. The location affords a 180º view of the terrain to the west, south and north. Donnelly Dome is visible to the southwest; the Granite Mountains are due south; and Butch Lake is located roughly 825 m due north. The western margin of the landform drops steeply 15 m to

the valley below, providing a commanding view of Jarvis Creek and the alluvial plain to the west. The main north-south thoroughfare of the project area runs through the site, and surface visibility—areas disturbed by the trail, and a 20 x 10 m area devoid of cover at the crest of the knoll—is estimated at 60%. Site vegetation consists of dwarf birch, low-bush cranberry, low scrub, and burned black spruce. The ecotype is characterized as upland low and high disturbed flora. The elevation is 565 masl.

XMH-01371 was found through pedestrian survey of the project area APE. The site consists of three tertiary flakes—one of black chert, and two of gray chert—found scattered on the surface over a 15 m x 15 m area at the crest of the knoll. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 20% of the site is estimated to have been disturbed. The landform contains preserved silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 67. XMH-01371 overview (view to north)

XMH-01372
Determination of Eligibility: Not evaluated

XMH-01372 is located on a large knoll that is roughly 150 m north-south by 120 m east-west. The location affords a prominent 360º view of the surrounding terrain: Donnelly Dome is visible to the southwest; the Granite Mountains are due south, and a large lake is due north. The main north-south thoroughfare of the project area runs through the site and surface visibility—areas disturbed by the trail, and a 30 m x 20 m area devoid of cover at the crest of the knoll—is estimated at 30%. Site vegetation consists of dwarf birch, low-bush cranberry, low scrub, and low alder. The ecotype is characterized as upland low and high disturbed flora. The elevation is 571 masl.

XMH-01372 was found through pedestrian survey of the project area APE. The site consists of a single basalt bifacial-thinning found on the surface on the western slope of the knoll. The flake is heavily patinated, and one face exhibits wind-polish, indicating that it spent a considerable amount of time exposed on the surface. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 5% of the site is estimated to have been disturbed. The landform contains extensive silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 68. XMH-01372 overview (view to east)

XMH-01373
Determination of Eligibility: Not evaluated

XMH-01373 is an extensive site located on the crest of a very large, high hill. The prominence represents highest point and most conspicuous landmark in the area. The location provides a commanding 360º view of the surrounding terrain: Donnelly Dome is visible to the southwest; the Granite Mountains are due south; and a large lake is northwest. The site has an especially good view of the valley floor to the south and east and would have provided an ideal vantage point for spotting game in these areas. The site is at a main trail junction of the project area. Surface visibility consisting of areas disturbed by the two trails, and a 30 m x 20 m cleared area, is estimated at 30%. Site vegetation consists of dwarf birch, low-bush cranberry, and low alder. The ecotype is characterized as upland low and high disturbed flora. The elevation is 658 masl.

XMH-01373 was discovered through pedestrian survey of the project area APE. The site consists of more than 100 flakes found on the surface of a 90 m x 40 m area on the broad, flat crest of the hill. At least eight different material types are represented: dark gray chert; light gray chert; greenish gray chert; banded chert; reddish chert; rhyolite; basalt; and quartz crystal. The densest concentration of flakes is located on the southern aspect of the hill. This concentration primarily contains bifacial-thinning flakes; however, it also yielded the following tools (all of which were collected):

(1) A reddish (5YR 5/6) chert microblade medial fragment (Figure 70, A). The microblade fragment is 7.8 mm long, 4.8 mm wide, and 1.2 mm thick, with a single arris.

(2) A pale yellow (5Y 7/4) chert fragmentary biface that probably represents the distal half of a broken lanceolate projectile point (Figure 70, B). It measures 32.6 mm long, 19.6 mm maximum thickness, and 7.5 maximum thickness.

(3) A grey (5Y 4/1) biface fragment (Figure 70, C). It is 37.1 mm long, 26.2 mm maximum width, and 7.9 mm maximum thickness.

No shovel tests were conducted at the site; however the landform contains extensive intact loess deposits, and it is certain that there are buried cultural materials.

Recommendations:
This extensive site likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 15% of the site is estimated to have been disturbed. The landform contains extensive silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 69. XMH-01373 overview (view to west)

Figure 70. XMH-01373 artifacts

XMH-01374
Determination of Eligibility: Not evaluated

XMH-01374 is located on a prominent knoll on the eastern rim of a north-south trending terrace edge. The location affords a commanding view of the surrounding terrain: Donnelly Dome is visible to the west; and the Granite Mountains are due south. The eastern margin of the landform drops steeply 50 m to the valley below, providing an exceptional view of Granite Creek and the alluvial plain to the east. A side trail associated with the proposed project terminates at the site, and surface exposure—limited to areas disturbed by the trail, and a 45 m x 55 m area devoid of surface cover at the crest of the knoll—is estimated at 60%. Site vegetation consists of low-bush cranberry, dwarf scrub, and low alder. The ecotype is characterized as upland rocky dry dwarf scrub low. The elevation is 607 masl.

XMH-01374 was found through pedestrian survey of the project area APE. The site consists of four tertiary flakes—one of black chert, and three of gray chert—found scattered on the surface over a 15 m x 15 m area at the crest of the knoll. One of the gray chert flakes is heavily patinated indicating that it spent a considerable amount of time exposed at the surface. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. While glacial gravels are exposed at the surface over 60% of the site, there are limited areas of aeolian deposition that might be found to contain buried archaeological remains and intact stratigraphy. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 71. XMH-01374 overview (view to north)

XMH-01375
Determination of Eligibility: Not evaluated

XMH-01375 is located on the crest of a large (roughly 120 m x 90 m), high hill. The location provides a commanding 360º view of the surrounding terrain: Donnelly Dome is visible to the southwest; the Granite Mountains are due south; two small lakes are located 350 m northwest; and an additional small lake is 400 m to the east. A north-south project trail runs through the site and surface exposure—areas disturbed by the trail, and a 20 m x 10 m area of surface exposure at the crest of the knoll—is estimated at 30%. Site vegetation consists of dwarf birch, low scrub,

and burned birch stumps. The ecotype is characterized as upland low and high disturbed flora. The elevation is 616 masl.

XMH-01375 was found through pedestrian survey of the project area APE. The site consists of at least seventeen flakes spread over a roughly 80 m x 30 m area at the crest of the hill. All of the debitage can be characterized as tertiary, late-stage reduction debris, or bifacial-thinning flakes. Four different material types are represented in the assemblage: gray chert, black chert, greenish gray chert, and translucent brownish gray chert. One tool—an end-scraper made of brownish-gray chert—was collected (Figure 73). No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of trail disturbance and surface exposure that revealed the observed artifacts. In total, less than 10% of the site is estimated to have been disturbed. The landform contains preserved silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 72. XMH-01375 overview (view to south)

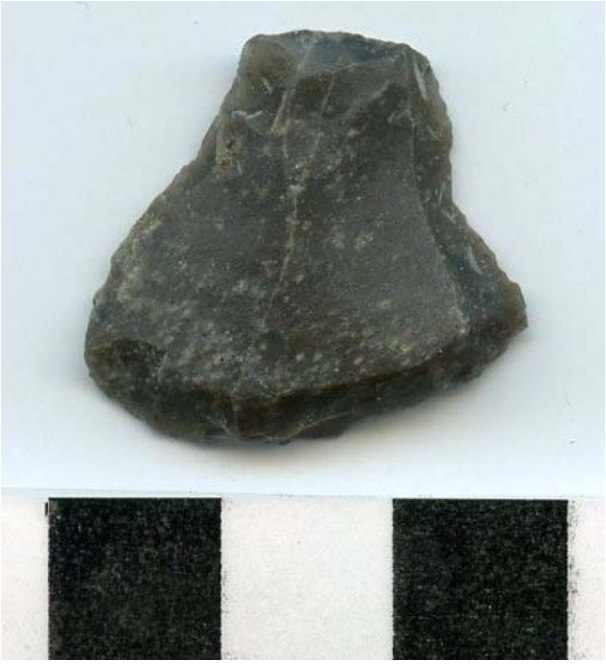

Figure 73. XMH01375 endscraper

XMH-01376
Determination of Eligibility: Not evaluated

XMH-01376 is an extensive site located on the crest of a large (roughly 80 m x 50 m), high hill. The view shed at the site is roughly 180º with open views to the south, west and east: Donnelly Dome is visible to the southwest; the Granite Mountains are due south, a small unnamed lake is 300 m to the south southwest. A north-south project trail runs through the site, and surface visibility—limited to areas disturbed by the trail—is estimated at less than 10%. Site vegetation consists of dwarf birch, low-bush cranberry, dwarf scrub, and burned black spruce stumps. The ecotype is characterized as upland low and high disturbed flora. The elevation is 610 masl.

XMH-01376 was found through pedestrian survey of the project area APE. The site consists of at least two tertiary basalt flakes found on the surface on the crest of the hill. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of trail disturbance and surface exposure that revealed the observed artifacts. The landform contains preserved silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 74. XMH-01376 overview (view to east)

XMH-01377
Determination of Eligibility: Not evaluated

XMH-01377 is an extensive site located on the crest of a very large, high hill that represents the highest landform in the immediate vicinity. The location provides a commanding 360º view of the surrounding terrain: Donnelly Dome is visible to the southwest; the Granite Mountains are due south, Butch Lake is visible to the northwest; and a small unnamed lake is roughly 245 m to the west southwest. A project trail runs through the site. Surface visibility—areas disturbed by the trail, and a roughly 50 m x 40 m area devoid of vegetation on the southern and western flanks of the landform—is estimated at 30%. Site vegetation consists of dwarf birch, low-bush cranberry, low alder, black spruce and burned black spruce stumps. The ecotype is characterized as upland low and high disturbed flora.

XMH-01377 was discovered through pedestrian survey of the project area APE. The site consists of more than 100 flakes found on the surface of a roughly 100 m x 70 m area on the broad, flat crest of the hill. At least 10 different material types are represented: black chert; gray chert; white chert; banded chert; translucent white chalcedony; white oolitic chert; translucent blackish obsidian; gray opaque obsidian, rhyolite, and cream-colored chert. The observed assemblage primarily contains late-stage lithic reduction debris, tertiary flakes, and bifacial-thinning flakes; however, several tools were collected including:

(1) Five obsidian microblades, one complete, four medial segments (Figure 76). All of these were found in a distinct cluster concentrated in an area roughly 1.5 m x 1.5 m. Metric attributes of the microblades are detailed in Table 1. XRF analysis indicates that each of the microblades was made of obsidian from the Batza Tena source, located more than 400 km to the north (Appendix 1).

Table 6. XMH-01377 microblade attributes

FS	Length (mm)	Width (mm)	Thickness (mm)	# of Arrises	Segment	Material	Color
5	22.6	6.3	2.2	1	medial	obsidian	gray clear
4	11.4	4.3	1.1	1	medial	obsidian	gray clear
3	10.1	5.3	1.5	2	medial	obsidian	gray clear
2	7	6.2	1.5	1	medial	obsidian	gray clear
1	8.6	4.7	1.5	2	medial	obsidian	gray clear

(2) A complete biface made of tan (2.5Y 6/4) rhyolite (Figure 77, A). The artifact is late-stage biface, likely a projectile point perform, measuring 49 mm long, 27.8 mm maximum width, and 8.6 mm maximum thickness.

(3) A relatively large scraper made of tan (2.5Y 5/1) rhyolite (Figure 77, B). It measures 57.7 mm long, 34.6 mm maximum width, and 9.9 mm. It exhibits random pressure retouch along the entire extent of one margin.

Two additional obsidian flakes were collected for XRF source determinations. Both of these yielded a signature consistent with the Wiki Peak source located in the Wrangell Mountains more than 280 km to the south.

No shovel tests were conducted at the site.

Recommendations:
This large, extensive site likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 10% of the site is estimated to have been disturbed. The landform contains extensive silt deposits underscoring the possibility for intact stratigraphy and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 75. XMH-01377 overview (view to south)

Figure 76. XMH-01377 microblades (from left to right: FS5, FS4, FS3, FS2, FS1)

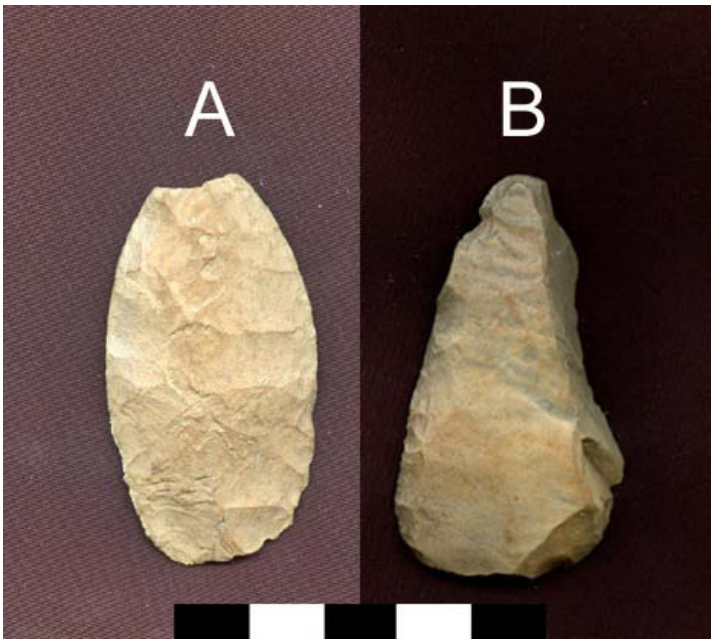

Figure 77. XMH-01377 biface (A) and scraper (B)

XMH-01378
Determination of Eligibility: Not evaluated

XMH-01378 is located on the crest of a 60 m x 70 m knoll. The location affords a 360º view of the surrounding terrain: Donnelly Dome is visible to the west; and the Granite Mountains are due south. The vantage point provides a particularly commanding view of the valley floor to the south and east. The nearest water is a small, unnamed lake roughly 300 m to the north. A trail associated with the proposed project runs across the site, and surface exposure—limited to areas disturbed by the trail, and a 15 x 25 m area devoid of vegetation at the crest of the knoll —is estimated at 15%. Site vegetation consists primarily of dwarf birch, with some scattered low-bush cranberry, and the remains of a few burned black spruce trees. The ecotype is characterized as upland low and high disturbed flora. The elevation is 604 masl.

XMH-01378 was found through pedestrian survey of the project area APE. The site consists of five tertiary flakes —one of banded chert, one of dark gray chert, and three of light gray chert—found scattered on the surface on the crest of the knoll. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. While glacial gravels are exposed at the surface over 60% of the site, there are areas containing intact silt deposits that might be found to contain buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 78. XMH-01378 overview (view to west)

XMH-01379
Determination of Eligibility: Not evaluated

XMH-01379 is located on the western edge of a low north-south trending outwash terrace. The site is located on relatively flat ground (slope of 2-5°) on top of the terrace. The terrain slopes to the west at a grade of up to 30% and drops roughly 30 m to the Jarvis Creek floodplain below. The location affords a 360º view of the surrounding terrain: Donnelly Dome is visible to the west; the Granite Mountains are due south; the peak of Muskeg Hill is to the north; and Panoramic Peak is visible to the east. This vantage point provides a particularly commanding view of Jarvis Creek— the nearest source of water 500 m to the west. A trail runs across the site, and surface exposure—limited to areas disturbed by the trail, and a 20 m x 7 m area devoid of cover adjacent to the trail —is estimated at 10%. Site vegetation consists primarily of low alder, dwarf birch, low-bush cranberry, scattered small black spruce, and the remains of a few burned black spruce trees. The site ecotype is characterized as upland low and high disturbed flora, the surrounding area is lowland tussock bog and moist meadow. Site elevation is 575 masl.

XMH-01379 was found through pedestrian survey of the project area APE. The site consists of a two flakes—a basalt flake, and reddish chert (probably burned) chert flake— found on the surface separated by a distance of roughly 5 m. Both of these are small tertiary flakes. No shovel tests were conducted.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. Surface exposure is minimal, and there seems to be a high

likelihood of intact deposits and buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 79. XMH-01379 overview (view to west)

XMH-01380
Determination of Eligibility: Not evaluated

XMH-01380 is located on the southern slope of a very large (>200 m diameter), high hill. The location affords a 180º view of the surrounding terrain with good view to the south, east and west. Donnelly Dome is visible to the; the Granite Mountains are due south and east; and Panoramic Peak is visible to the east. The view shed to the north is blocked by the crest of the hill. A project trail runs across the site, and surface exposure is estimated at 50%. Site vegetation consists primarily of low alder, low birch, dwarf birch, and low-bush cranberry. The site ecotype is characterized as upland rocky low scrub. Site elevation is 679 masl.

XMH-01380 was found through pedestrian survey of the project area APE. The site consists of a single black chert flake broken into two pieces found on the surface separated by a distance of less than a meter. The bifacial-thinning flake displays a well-prepared, lipped platform. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. Glacial gravels are exposed over large areas of the site; however, there is the potential for intact deposits and buried archaeological remains. If the proposed

project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 80. XMH-01380 overview (view to east)

XMH-01381
Determination of Eligibility: Not evaluated

XMH-01381 is located on the crest of a north-south trending ridge. The ridge top is at least 70 m wide. Both its east and west sides drop steeply at a slope of roughly 30-40°. The location provides a commanding 360º view of the surrounding terrain: Donnelly Dome is visible to the west; the Granite Mountains are due south and east with Panoramic Peak visible to the east; the Alaska Range is to the south and west with Mt. Hayes visible to the southwest; Butch Lake is north northwest; and XMH-01373 is roughly 300 m away. The major north-south project trail runs across the site. Surface exposure—limited to areas where the trail crosses the site—is estimated at less than 5%. Site vegetation consists primarily of dwarf birch, low alder, and the scattered remains of burnt black spruce. The site ecotype is characterized as upland low and high disturbed flora. Site elevation is 657 masl.

XMH-01381 was found through pedestrian survey of the project area APE. The site consists of two biface fragments collected from the exposed surface of the road bed. The first of these is a distal fragment made of black chert (Figure 82, A). The other is a well-worked medial fragment that is extremely wide and thin and made of high-quality translucent gray chert (Figure 82, B). No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent

of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 5% of the site is estimated to have been disturbed. The landform contains apparently intact stratigraphic deposits underscoring the potential for buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 81. XMH-01381 overview (view to east)

Figure 82. XMH-01381 biface fragments

XMH-01382
Determination of Eligibility: Not evaluated

XMH-01382 is located on a flat area roughly 80 m wide on the top of a north-south trending ridge. The ridge top slopes gradually, dropping to the north at a 7-12° grade. The western slope drops gently at a 30° grade, while the eastern slope is steeper, dropping at 45° grade. This location provides a 270º view of the surrounding terrain, with good views to the northwest, north, east, south and southeast: Donnelly Dome is visible to the west; the Alaska Range is to the south and west with Mt. Hayes visible to the southwest; a large lake is to the northwest; and the Granite Mountains are to the south and east with Panoramic Peak visible in the east. The landform provides an exceptionally commanding view of both Granite Creek and Jarvis Creek. The nearest source of water is a small unnamed lake located 550 m away almost due north. The ridge climbs to the southwest to a large hill 350 m distant that obscures the view in that direction and is the location of XMH-01373. Surface exposure is limited to areas where the project trail crosses the site and is estimated at less than 5%. Site vegetation consists primarily of dwarf birch, scattered low alder, and isolated remains of burnt black spruce. Site ecotype is characterized as upland low and high disturbed flora. Site elevation is 640 masl (meters above sea level).

XMH-01382 was found through pedestrian survey of the project area APE. The site consists of two flakes—one of greenish gray chert, the other of black chert—found in the exposed surface of the road bed. Both of these are proximal fragments of tertiary flakes that exhibit morphological characteristics consistent with bifacial-thinning flakes. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the limited extent of roadbed disturbance and surface exposure that revealed the observed artifacts. In total, less than 5% of the site is estimated to have been disturbed. The landform apparently contains intact stratigraphic deposits underscoring the potential for buried archaeological remains. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 83. XMH-01382 overview (view to south)

XMH-01383
Determination of Eligibility: Not evaluated

XMH-01383 is located on the eastern point of an east-west trending ridge. Site slope is relatively flat, with a grade of 3-7%. The landform slopes downward to the east at a 20-30% grade, dropping roughly 15 m to the valley floor below. This location provides a 180º view of the surrounding terrain, with good views to the east north, and southwest. The Alaska Range is visible to the south and west with Mt. Hayes visible in the southwest. The Granite Mountains are to the south and east with Panoramic Peak visible in the east. This vantage point also provides and an exceptionally commanding view of Granite Creek and the valley floor to the east. A project trail terminates at the landform. The trail and a 12 m x 6 m cleared area expose the surface over roughly 40% of the site. Site vegetation consists primarily of dwarf birch, scattered low alder, low-bush cranberry, Labrador tea, scattered low birch trees and isolated remains of burned black spruce. Site ecotype is characterized as upland low and high disturbed flora. Site elevation is 598 masl.

XMH-01383 was found through pedestrian survey of the project area APE. The site consists of a single projectile point pre-form broken into two fragments (Figure 84), which were found lying adjacent to each other. The artifact is made of white (2.5Y 8/1) rhyolite. One face is entirely covered by heavy brown (7.5 YR 4/6) patina. Random (sub-parallel) pressure retouch covers roughly 40% of one face, and less than 20% of the opposite (patinated) face. In terms of morphology, the point is ovate, with “waisted”/indented lateral margins and a relatively small stem. It measures 56.93 mm in length, 32.92 mm maximum width, with a maximum thickness of 6.96 mm. Constructed on a flake, the point has a slightly curved profile with maximum thickness occurring at the base of the point at the remnant bulb of percussion. Several stepped/hinged flake scars originate from the basal margin of the point attesting to unsuccessful attempts to thin the base. The specimen evidently is a Northern Archaic side-notched preform that was discarded due to difficulties in working the poor lithic material. The nature of the

breakage pattern and the fact that the two fragments were found touching each other indicate that the point was broken subsequent to discard. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as an isolated find; however, it possibly contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. In assessing this possibility, it is important to note the diagnostic nature of the recovered artifact and the limited extent of surface exposure that revealed the cultural material. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

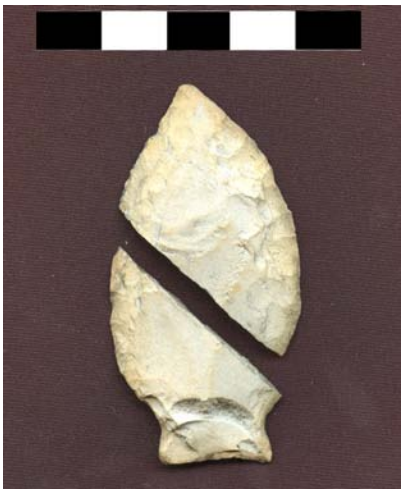

Figure 84. XMH-01383 broken projectile point preform

Figure 85. XMH-01383 overview (view to east)

XMH-01384
Determination of Eligibility: Not evaluated

XMH-01384 is located on a hill that is roughly 130 m east-west and 50 m north-south. The location provides a 180º view of the surrounding terrain, with good views to the east, west and south: the Alaska Range is visible to the south and west with Mt. Hayes visible to the southwest; and the Granite Mountains are to the south and east with Panoramic Peak visible to the east. The landform provides an exceptionally commanding view of the valley floor and Granite Creek to the east. The view to the north is obscured by several low hills and ridges. The nearest source of water is a small unnamed lake located 150 m away due west. In general, there is a marked lack of deposition with surface exposed over an estimated 60% of the site area. Site vegetation consists primarily of dwarf birch, scattered low birch trees, and low-bush cranberry. Site ecotype is characterized as upland low and high disturbed flora. Site elevation is 564 masl.

XMH-01384 was found through pedestrian survey of the project area APE. The site consists of six flakes and one tool. The flakes were found concentrated in an area of 3 m x 3 m, while the tool was collected 80 m away at the point of the landform. All of the flakes can be characterized as tertiary debitage; four are made of gray chert, one is of reddish chert that shows evidence of being burned, and one is of black basalt. The tool is a fragmentary uniface/retouched flake made of a dark red coarse-grained chert. No shovel tests were conducted at the site.

Recommendations:
The site has been initially classified as a small lithic scatter; however, it likely contains additional cultural material that could contribute important information to our understanding of the prehistory of the region. While the surface is exposed over a significant portion of the landform, the possibility remains that there are intact. If the proposed project entails development that will impact the site, the site should be evaluated to determine its eligibility for inclusion in the NRHP.

Figure 86. XMH-01384 overview (view to north)

Summary

A total of 26 prehistoric archaeological sites that are potentially eligible for inclusion in the NRHP have been identified within the APE of the proposed project. All of these sites are largely intact and contain cultural material that can potentially provide significant information pertaining to the prehistory of interior Alaska. These sites are representative of many archaeological sites of the glacial recessional terrain immediately north and south of the Alaska Range. Although artifact densities can be relatively low at these apparent short-term camps and hunting lookouts, they have significant research potential for addressing a number of important regional questions. As the integrity of many sites in the vicinity of DTA East has been diminished by intensive military training activities, these sites are particularly important for interpreting the prehistory of the DTA and the region at large. Application of 36CFR800.5 indicates a finding of "historic properties affects." These sites will be avoided through design modification whenever possible. If avoidance is not feasible, consultation with the State Historic Preservation Officer (SHPO) and interested Tribal governments will ensue to identify appropriate mitigation measures, prior to the advent of any future construction.

REFERENCES

Aigner, J. and R. Lively
1986 Chugwater. *Archaeology* 39(6).

Anderson, D.
1968 *Early notched points and related assemblages in Western American Arctic*. Unpublished manuscript on file on the University of Alaska Museum.

1970a Microblade Traditions in Northwestern Alaska. In *Arctic Anthropology* 7(2): 2-16.

1970b Akmak: An Early Archaeological Assemblage from Onion Portage, Northwest Alaska. *Acta Arctica 16.* Copenhagen.

Andrews, E.F.
1975 *Salcha: an Athabaskan Band of the Tanana River and its Culture*. Master's Thesis, University of Alaska Fairbanks.

1977 *Report on the Cultural Resources of the Doyon Region, Central Alaska: Volumes I and II*. Occasional Paper No. 5. Anthropology and Historic Preservation, Cooperative Park Studies Unit, University of Alaska, Fairbanks.

1987 Archaeological Evidence of European Contact: the Han Athabaskans near Eagle, Alaska. In *High Plains Applied Anthropology* 7(2): 51-64.

Bacon, G. H.
1978 *Final Report on the Archaeological Survey of the XM-1 Tank Range, Fort Greely, Alaska*. Final Report. Prepared for the US Army Corps of Engineers. Alaska District, NPASU-78-78-41. Prepared by Alaskarctic, Fairbanks.

Bacon, G.H. and C.E. Holmes
1979 *Archaeological Survey and Inventory of Cultural Resources at Fort Greely, Alaska,* 1979. Final Report. Prepared for the U.S. Army Corps of Engineers, Alaska District.

Bacon, G.H., J.A. Ketz, C.M. Mobley
1986 Historic Preservation Plans for U.S. Army Lands in Alaska. Fairbanks, Alaska: Alaska Heritage Research Group.

Bowers. P.M., O.K. Mason, S.L. Ludwig, A.S. Higgs, and C.W. Smythe
1995 *Cultural Resources Inventory of the Proposed Healy to Fairbanks Northern Intertie, South Route and Tanana Flats Alternatives*. Final Report. Prepared for Golden Valley Electric Association.

Center for the Environmental Management of Military Lands (CEMML)
2001 *Integrated Cultural Resources Management Plan 2002-2006, Fort Richardson, Alaska*, United States Army Alaska, CEMML, Colorado State University, Fort Collins, CO.

2002 *Integrated Natural Resource Management Plan 2002-2006, Fort Wainwright,* United States Army Alaska, CEMML, Colorado State University, Fort Collins, CO.

Chandonnet, A.
1979 *The Once and Future Village of Ikluat/Eklutna.* Adams Press, Chicago.

Clark, D.W.
1992 The Archaic in the Extreme Northwest of North America. *Revista de Arqueología Americana* 5: 71-99.

Cook, J. P.
1979 *Site XBD-094; Aircraft Assault Strip, Fort Wainwright, Alaska.* Prepared for the U.S. Army Corps of Engineers. On file at the State Historic Preservation Office, Anchorage.

1989 Historic Archaeology and Ethnohistory at Healy Lake, Alaska. In *Arctic* 42(3): 109-118.

Cook, J. P. and T. E. Gillispie
1986 *Notched Points and Microblades.* Paper presented at the 13th Annual Meeting of the Alaskan Anthropological Association, Fairbanks, Alaska.

Cook, J. P. and R. A. McKennan
1971 *The Athabaskan Tradition: A View from Healy Lake*. Paper presented to Athabaskan Conference, Museum of Man, Ottawa, March 1971.

Department of the Interior, National Park Service, National Register, History and Education
2000 *National Register Bulletin, Guidelines for Evaluating and Registering Archaeological Properties.* Barbara Little, Erika Martin Seibert, Jan Townsend, John H. Sprinkle, Jr., and John Knoerl (eds.)

Dilley, T.
1996 *Geoarchaeological Potential of Elmendorf Air Force Base*. Unpublished report prepared for the United States Air force.

Dixon, E.J., G.S. Smith, and D. Plaskett
1980 *Archaeological Survey and Inventory of Cultural Resources, Fort Wainwright, Alaska.* Prepared for U.S. Army Corps of Engineers, Alaska District.

1985 Cultural Chronology of Central Interior Alaska. *Arctic Anthropology* 22: 47-66.

Dixon, J., G. Smith, W. Andrefsky, B. Saleeby and C. Utermohle
1985 Draft Report: Susitna Hydroelectric Project, Cultural Resources Investigations 1979-1985, Volume I Chapters 1-10, Appendix A. UA Museum for Alaska Power Authority.

Dixon, G.
1980 The Moose River Site, 1978 (with a special Appendixy John E. Lobdell). In Archaeological Survey Projects, 1978, T.L. Dilliplane (ed.), Pp. 32-48. *Miscellaneous Publications, History and Archaeology Series, No. 22.* Alaska Division of Parks, Department of Natural Resources, Anchorage.

Dumond, D.E.
1977 *The Eskimos and Aleuts*. London: Thames and Hudson.

Dumond, D.E., and R.L.A. Mace
1968 An Archaeological Survey Along Knik Arm. *Anthropological Paper of the University of Alaska* 14(1): 1-21.

Erlandson, J.R., M.H. Walser, N. Bigelow, J. Cook, R. Lively, C. Adkins, D. Dodson, A. Higgs, and J. Wilber
1991 Two Early Sites of Eastern Beringia. *Radiocarbon* 33 (1):35-50.

Esdale, J.
2007 *A History of Northern Archaic Research and a Summary of Current Problems.* Paper presented at the 34th Annual Meeting of the Alaskan Anthropological Association, Fairbanks, Alaska.

Fall, J.
1987 Upper Inlet Dena'ina regional bands, Subsistence Patterns and Traditional Leaders in Shem Pete's Alaska: The Territory of the Upper Cook Inlet Dena'ina. Pp 21-28. Eds J. Kari and J.A. Falls. Alaska Native Language Center, University of Alaska, CIRI Foundation.

Frizzera, A.
1973 *Preliminary Survey Report, Blair Lakes Alaska*. Fairbanks, Alaska: University of Alaska, Fairbanks, Anthropology Department.

Gabriel, H.W., and G.F. Tande
1983 *A Regional Approach to Fire History in Alaska.* U.S. Department of the Interior, Bureau of Land Management Technical Report 9, BLM/AK/TR-83/09.

Gamza, T.
1995 *Excavation and Evaluation of Sullivan's Roadhouse (XBD-061), Fort Greely, Alaska 1994*. Final Report. Prepared for the Office of History and Archaeology, Division of Parks and Recreation, Alaska Department of Natural Resources, Anchorage.

Goodman, E.A., B.A. Potter, P.M. Bowers, K.W.M. Farmen
2002 *Cultural Resources Survey of a Proposed Powerline at Fort Greely, Alaska*. Prepared for Golden Valley Electric Association, Fairbanks, AK.

Griset, Suzanne and Marc Kodack
1999 Guidelines for the Field Collection of Archaeological Materials and Standard Operating Procedures for Curating Department of Defense Archaeological Collections. Department of Defense.

Hedman, W., A. Robertson, N. Fichter and K. Anderson
2003 *Archaeological Survey and Evaluation, Fort Richardson and Fort Wainwright, 2002.* Center for Environmental Management of Military Lands (CEMML), Colorado State University, Ft. Collins, CO and U.S. Army Alaska, Fort Richardson, AK.

Henn, W.
1978 Archaeology on the Alaska Peninsula: The Ugashik Drainage, 197301975. *University of Oregon Anthropological Papers 14.* Eugene.

Hoffecker, J. F.
1996 Introduction to the Archaeology of Beringia. In *American Beginnings: The Prehistory and Paleoecology of Beringia.* Frederick Hadleigh West, ed., pp. 149-153. University of Chicago Press

Hoffecker, J.F., W.R. Powers, and T. Goebel
1993 The Colonization of Beringia and the Peopling of the New World. In *Science* 259:46-52.

Higgs, A.S., B.A. Potter, P.M. Bowers, and O.K. Mason
1999 *Cultural Resource Survey Report of the Yukon Training Area and Fort Greely Army Lands Withdrawal, Alaska. Draft Report*. Prepared for CRREL and ABR Inc., Fairbanks.

Hollinger, K.
2001 *Homesteads on Fort Richardson, Alaska.* Center for Environmental Management of Military Lands (CEMML), Colorado State University, Fort Collins, CO and U.S. Army Alaska, Fort Richardson, AK.

Holmes, C.E.
1978 *Obsidian Hydration Studies: A Preliminary Report of Results. Central Alaska*. Paper presented at Alaskan Archaeology Symposium, 31st Annual Northwest Anthropological Conference, Pullman, Washington.

1979 *Archeological Reconnaissance Report for Fort Wainwright, Fort Greely, and Fort Richardson Withdrawal Lands, Alaska.* Report Prepared for the 172nd Infantry Brigade.

1996 Broken Mammoth Site. In *American Beginnings: The Prehistory and Paleoecology of Beringia.* Frederick Hadleigh West, ed. University of Chicago Press.

1998 New Data Pertaining to Swan Point, the Oldest Microblade Site Known in Alaska, *Current Research in the Pleistocene* (15) 21-22.

2001 Tanana River Valley Archaeology circa 14,000 to 9000 B.P. *Arctic Anthropology* 38(2):154-170.

2000 "Classification of Early Alaskan Archaeological Assemblages: the Search for Useful Criteria." Paper presented at Canadian Archaeological Association 33rd Annual Conference, Ottawa.

2002 *Summary Report: Determination of National Register Eligibility for Three Archaeological Sites at Fort Greely, Alaska.* Office of History and Archaeology Report No. 89. Division of Parks and Outdoor Recreation, Alaska Department of Natural Resources.

2007 *The East Beringian Tradition and the Transitional Period: New Data from Swan Point.* Paper presented at the 34th Annual Meeting of the Alaskan Anthropological Association, Fairbanks, Alaska.

2008 *Lithic Technology of the East Beringian Tradition: Sustaining the Cutting Edge.* Paper presented at the 73rd Annual Meeting of the Society for American Archaeology, Vancouver (March 26-30

Holmes C. E. and J. Anderson
1986 *Archaeology and Paleoecology of the Delta River Area, Interior Alaska*. National Science Foundation Project Summary Manuscript on file at the State Historic Preservation Office, Anchorage.

Holmes, C. E., R. Vanderhoek, and T. E. Dilley
1996 Swan Point. In *American Beginnings: The Prehistory and Paleoecology of Beringia*. Edited by Frederick Hadleigh West. Pp. 319-323. University of Chicago Press.

Jorgensen. M.T., J.E. Roth, S.F. Schlentner, E.R. Pullman, M. Macander, and C. Racine
2003 *An Ecological Land Survey for Fort Richardson, Alaska*. Report prepared by the Cold Regions Research Laboratory for U.S. Army Alaska

Jorgensen. M.T., J.E. Roth, M.D. Smith, , S.F. Schlentner, W. Lentz, E.R. Pullman, and C. Racine
1999 *An Ecological Land Survey for Fort Greely, Alaska*. Report prepared by the Cold Regions Research Laboratory for U.S. Army Alaska

Kari, J.
1988 Some Linguistic Insights into Dena'ina Preshistory. In *The Late Prehistoric Development of Alaska's Native People*. Pp 319-338. Eds. R. Shaw, R. Harritt, and D. Dumond. Aurora, Alaska Anthropological Assocaition Monograph Series #4, Anchorage

Kari, J. and P.R. Kari
1982 Tanaina Country=Denaina elnena. Alaska Native Language Center, University of Alaska (Fairbanks).

Ketz, J. A.
1982 *Paxson Lake, Two Nineteenth Century Ahtna Sites in the Copper River Basin*. Master's Thesis, on file at the University of Alaska Fairbanks.

Livchar, R., C. Racine, B. Murray, and G. Tande
1997 *Floristic Inventory of Vascular and Cryptogam Plant Species at Fort Richardson, AK.* Report prepared by Waterways Experiment Station and Cold Regions Research and Engineering Laboratory, U.S. Army Corps of Engineers.

Lively, R.
1988 *Chugwater: A Study of the Effectiveness of a Small Scale Probabilistic Sampling Design of an Interior Alaskan Site, Chugwater (FAI-035).* Manuscript on file at the U.S. Army Corps of Engineers, Alaska District, Anchorage.

Maitland, R.E.
1986 *The Chugwater Site, Moose Creek Bluff, Alaska, 1982 and 1983 Field Seasons.* Final Report. Prepared for the U.S. Army Corps of Engineers.

McFadyen, C. A.
1981 Koyukon. In: *Handbook of North American Indians, Volume 6: Subarctic,* edited by J. Helm, pp. 582-601. Smithsonian Institution, Washington, D.C.

1996 Who Lived in This House? A Study of Koyukuk River Semisubterranean Houses. *Mercury Series Archaeological Survey of Canada Paper 153*. Canadian Museum of Civilization. Hull, Quebec, Canada.

McKennan, R.A.
1959 *The Upper Tanana Indians*. Yale University Publications in Anthropology No. 55.

1969 Athabaskan Groups of Central Alaska at the Time of White Contact. In *Ethnohistory* 16 (4):335-343.

1981 Tanana. In: *Handbook of North American Indians*, Vol. 6, Subarctic. Volume Edited by June Helm. Smithsonian Institution, Washington.

McKennan, R. A. and J. P. Cook
1970 Prehistory of Healy Lake, Alaska. In *Proceedings of the 8th International Congress of Anthropological and Ethnological Sciences, vol.3*, pp. 182-184. Tokyo and Kyoto, 1968.

McMahan, J.D., R.J. dale, and C.E. Holmes
1991 *Cultural Resources Testing and Evaluation of Selected Sites Along the Sterling Highway Milepost 37-60, Kenai Peninsula, Alaska, 1988-1989 Project F021-2(15)/(A09812). Office of History and Archaeology Report No. 14*, Alaska Division of Parks and Outdoor Recreation, Anchorage.

McNab, W.H., and P.E. Avers
1994 *Ecological Subregions of the United States: Section Descriptions.* Administrative Publicatioin WO-WAS-5, U.S. Department of Agriculture, Forest Service, Washington, DC.

Mishler, C. W.
1986 *Born With the River: An Ethnographic History of Alaska's Goodpaster and Big Delta Indians*. Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys Reports, Public Data File 86-14, Fairbanks.

Mobley, C.M., M. Eldridge
1992 Culturally Modified Trees in the Pacific Northwest. *Arctic Anthropology* 29: 91-110

Mobley, C.M., and M. Lewis
2009 Tree-Ring Analysis of Traditional Native Bark-Stripping at Ship Island, Southeast Alaska, USA. *Vegetation History and Archaeobotany* 18: 261-268

Muhs, D.R. and J.R. Budahn,
2006 Geochemical evidence for the origin of late Quaternary loess in central Alaska. *Canadian Journal of Earth Science* 43: 323-337.

Natural Resources Branch
2001 *US Army Alaska Integrated Natural Resources Management Plan 2002-2006, Volume 1 Fort Greely and Donnelly Training Area*. Final Draft.

2002 *U.S. Army Alaska Integrated Natural Resource Management Plan 2002-2006, Volume 3, Fort Wainwright*. Final Draft.

National Resources Conservation Service (NRCS)
2000 Soil inventory and mapping of Fort Richardson. U.S. Department of Agriculture, Anchorage, Alaska, unpublished report and maps.

Natural Cooperative Soil Survey
1999 *Soil Survey of Fort Wainwright Area, Alaska.* Report prepared by the United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with Department of the Army, FWA, Alaska Agricultural and Forestry Experiment Station, Fairbanks Soil and Water Conservation District and the Alaska Soil and water Conservation District. Palmer, Alaska

Neely, R. J.
2001 *Early Mining History: Fort Wainwright and Fort Greely, Alaska.* Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

2003 *Early Transportation Routes, Fort Wainwright, Alaska*. Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

Osgood ,C.
1937 The Ethnography of the Tanaina. *Yale University Publications in Athropology 16*. New Haven.

Pearson, G.A.
1997 New Evidence for a Nenana-Complex Occupation at the Moose Creek Site, Central Alaska: Preliminary Results of the 1996 Re-excavation. *Current Research in the Pleistocene* 14:72-74.

Phillips, W. T., Sr.
1984 *Roadhouses of the Richardson Highway, the First Quarter Century: 1898-1923*. State of Alaska, Alaska Historical Commission, Anchorage.

Potter, B.A.
2004 *Modeling Intersite Variability in Interior Alaska: Overcoming Conceptual Ambiguity Through Pattern Recognition.* Paper presented at the 69th Annual Meeting of the Society for American Archaeology, Montreal, Canada.

Potter, B.A., S.C. Gerlach, A.S. Higgs, and P.M. Bowers
2000 *Final Cultural Resource Survey: Fort Greely, Yukon Training Area (Fort Wainwright), Alaska for the National Missile Defense Program.* For USAR Space and Missile Defense Command, by Northern Land Use Research, Inc. Fairbanks, AK.

Powers, W. R. and J. F. Hoffecker
1989 Late Pleistocene Settlement in the Nenana Valley, Central Alaska. *American Antiquity* 54(2):263-87.

Powers, W. R., R. D. Guthrie and J. F. Hoffecker
1983 *Dry Creek: Archaeology and Paleoecology of a Late Pleistocene Alaskan Hunting Camp*. Report to the National Park Service, Washington D.C.

Price, K.
2002 *Homesteads on Fort Wainwright, Alaska.* Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

2004 *The World War II Heritage of Ladd Field, Fairbanks, Alaska.* Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

Rabich, J. and D. Reger
1978 Archaeological Excavations at the Gerstle River Quarry Site. In *Archaeological Survey Projects 1977. Miscellaneous Publications in History and Archaeology Series* No. 18. Alaska Department of Natural Resources, Division of Parks, Anchorage.

Raymond-Yakoubian, J. and A. Robertson
2005 *Methodology: U.S. Army Alaska 2005 Range Developments, Section 106 Archaeological Inventory and Evaluation, Fort Richardson and Fort Wainwright.* Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

Ream, B. A.
1986 *Old Fish Camp: an Ethnohistoric and Archeological Analysis of a Lower Yukon Koyukon Athabaskan Winter Village, Khotol River, Alaska.* Unpublished Master's thesis, Department of Anthropology, Western Washington University.

Reger, D.R.
1977 An Eskimo Site Near Kenai, Alaska. Anthropological Papers of the University of Alaska 18(2): 37-52

1981 A Model for Culture History in the Upper Cook Inlet, Alaska. Ph.D. Dissertation, Washington State University, Pullman.

Reger, D.R., and G.H. Bacon
1996 Long Lake. *In American Beginnings: The Prehistory and Paleoecology of Beringia.* Pp. 436-438. Ed by F.H. West. University of Chicago Press, Chicago

Reger, D.R., and A. Boraas
1991 An Overview of Radiocarbon Chronology in Cook Inlet Prehistory. Paper Presented at the 20th Annual Meetings of the Alaska Anthropological Association, Anchorage.

1996 An Overview of Radiocarbon Chronology in Cook Inlet Prehistory. In *Adventures Through Time: Readings in the Anthropology of Cook Inlet, Alaska.* Pp. 15-35. Eds . N. Yaw-Davis and W.E. Davis. Cook Inlet Historical Society, Anchorage.

Reger, D.R., and D.S. Pinney
1996 Late Wisconsin Glaciation of the Cook Inlet region with Emphasis on the Kenai Lowlands and Implications for Early Peopling. In *Adventures Through Time: Readings in the Anthropology of Cook Inlet, Alaska.* Pp. 156-171. Eds . N. Yaw-Davis and W.E. Davis. Cook Inlet Historical Society, Anchorage.

Reynolds, G.
1983 *Archaeological Reconnaissance of Four Borrow Pits, Fort Wainwright, Alaska.* Corps of Engineers. Anchorage, AK.

1984 *Archaeological Survey of Portions of the Fairbanks Petroleum, Oils, and Lubricants (POL) Terminal, Fort Wainwright, Alaska*.

1985 *Survey of Construction Projects, Fort Wainwright Cantonment.* Manuscript on file at the Office of History and Archaeology, Anchorage, AK.

1996 *Survey of Moose Run Golf Course Expansion, Fort Richardson, Alaska*. Division of Parks and Outdoor Recreation, Anchorage, AK.

Robertson, A.
2003 *Proposed Construction of a Gravel Source and Access Road Located at Fort Wainwright's Donnelly Training Area.* Section 106 Letter sent to SHPO 8-29-03. U.S. Army Garrison Alaska.

2004 *Field Methodology, U.S. Army Alaska, 2004 Range Developments, Section 106 Archaeological Inventory and Evaluation, Fort Richardson and Fort Wainwright.* Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

Robertson, A.C., S.J. Meitl, D. White, P. Gilbert, and C. Ciancibelli
2009 *Archaeological Survey and Evaluation: Donnelly Training Area, Fort Wainwright, Alaska 2008*. Center for Environmental Management of Military Lands (CEMML), Colorado State University, Ft. Collins, CO and U.S. Army Alaska, Fort Wainwright, Alaska.

Robertson, A., N. Fichter and K. Anderson
2004 *Annual Report: Archaeological Survey and Evaluation, Fort Richardson and Fort Wainwright, 2003.* Center for Environmental Management of Military Lands, Colorado State University, Fort Collins.

Robertson, A., M. Proue, C.K. Paraso, S. Shirar, and P. Gilbert
2008 *Archaeological data recovery for Site XMH-00874, Battle Area Complex (BAX) Mitigation, Donnelly Training Area, Fort Wainwright, Alaska 2007*. Center for Environmental Management of Military Lands (CEMML), Colorado State University, Ft. Collins, CO and U.S. Army Alaska, Fort Wainwright, Alaska.

Robertson, A.C., S.J. Meitl, D. White, P. Gilbert, and C. Ciancibelli
2009 *Archaeological Survey and Evaluation: Donnelly Training Area, Fort Wainwright, Alaska 2008*. Center for Environmental Management of Military Lands (CEMML), Colorado State University, Ft. Collins, CO and U.S. Army Alaska, Fort Wainwright, Alaska.

Sackett, R.
2000 *Proposed Road Upgrades to 33 Mile Loop Road and Gravel Source Located at Ft. Wainwright's Donnelly Training Area.* Section 106 letter sent to SHPO 7-18-00. U.S. Army Garrison, Fort Richardson, AK.

Shaw, R.
2000 *Historical Properties and Paleontological Resources Survey for the Realignment of the Alaska Railroad Corporation Tracks Across Elmendorf AFB and Fort Richardson, Alaska*. Report by Robert Shaw Enterprises for Tryck Nyman Hayes Inc., for Alaska Railroad Corporation.

Sheppard, W., A.F. Steffian, D.P. Staley, and N.H. Bigelow
1991 *Late Holocene Occupations at the Terrace Site, Tok, Alaska. Final Report.* Prepared for U.S. Air Force Over-the-Horizon Backscatter Radar Program, Fairbanks.

Sheppard, E., A.F. Steffian, D.P. Staley and N.H. Bigelow
2001 *Archaeological Survey and Cultural Resources Overview, Fort Richardson, Alaska.* U.S. Army Corps of Engineers, Anchorage, AK.

Shinkwin. A. D.
1979 *Dakah De'nin's Village and the Dixthada Site: a Contribution to Northern Alaskan Prehistory.* National Museum of Man Mercury Series No. 91.

Shinkwin, A.D. and J.S. Aigner
1979 *Historic and Prehistoric Land Use in the Upper Tanana Valley: Report on the Archaeological Survey Along the Alaska Highway Pipeline from Delta Junction to the Yukon Border.* Final Report. Prepared for Northwest Pipeline Company. Prepared by the University of Alaska Fairbanks.

Simeone, W.E.
1982 *A History of Alaskan Athabaskans: including a description of Athabaskan Culture and historical narrative, 1785-1971*. Alaska Historical Commission, Anchorage.

1995 *Rifles, Blankets, and Beads: Identity, History, and the Northern Athabaskan Potlatch.* University of Oklahoma Press, Norman.

Slobodin, N, and R.J. Speakman
2008 *XRF Characterization of Obsidian from U.S. Army Training Lands, Alaska.* Report prepared for the Center for Environmental Management of Military Lands (CEMML)

Staley, D. P.
1993 *A Phase I Cultural Resource Survey of 19 Locations for the Proposed Yukon Measurement and Debriefing System in Interior Alaska*. Final Report. Prepared by Mariah Associates, Inc. Albuquerque.

Steele, J.
1979 *Otter Lake Reconnaissance.* Manuscript on file at the U.S. Army Corps of Engineers, Anchorage, AK.

1980 *Archaeological Survey and Cultural Resources Overview, Fort Richardson, Alaska.* U.S. Army Corps of Engineers, AK.

1982 A*rcheological Assessment of Proposed Range Control Headquarters Building, Fort Wainwright, Alaska.* Manuscript on file at the U.S. Army Corps of Engineers, Alaska District.

1983 *Cultural Resource Assessment of Proposed Borrow Area, Fort Wainwright, Alaska.* Manuscript on file ant the U.S. Army Corps of Engineers, Alaska District.

Stryd A.H., and M. Eldridge
1993 CMT Archaeology in British Columbia: the Mears Island Studies. *BC Studies* 99: 184-234

Shepperd, W,L.
2001 Archaeological Testing and Survey in The Upper Tanana Region, Alaska

Sheppard, W., A.F. Steffian, D.P. Staley, and N.H. Bigelow
1991 *Late Holocene Occupations at the Terrace Site, Tok, Alaska.* Final Report. Prepared for U.S. Air Force Over-the–Horizon Backscatter Radar Program, Fairbanks.

Shinkwin, A.D.
1979 Dakah De'nin's Village and the Dixthada Site: a Contribution to Northern Alaskan Prehistory. National Museum of Man Mercury Series No. 91.

Shinkwin, A.D. and J.S. Aigner
1979 Historic and Prehistoric Land Use in the Upper Tanana Valley: Report on the Archaeological Survey Along the Alaska Highway Pipeline from Delta Junction to the Yukon Border. Final Report. Prepared for Northwest Pipeline Company. Prepared by the University of Alaska Fairbanks.

Simeone, W.E.
1982 A History of Alaskan Athabaskans: including a description of Athabaskan Culture and historical narrative, 1785-1971. Alaska Historical Commission.

1995 Rifles, Blankets, and Beads: Identity, History, and the Northern Athabaskan Potlatch. Norman: University of Oklahoma Press.

Staley, D. P.
1993 A Phase I Cultural Resource Survey of 19 Locations for the Proposed Yukon Measurement and Debriefing System in Interior Alaska. Final Report. Prepared by Mariah Associates, Inc. Albuquerque.

Steele, J.
1979 *Otter Lake Reconnaissance.* Manuscript on file at the U.S. Army Corps of Engineers, Anchorage, AK.

1980 *Archaeological Survey and Cultural Resources Overview, Fort Richardson, Alaska.* U.S. Army Corps of Engineers, AK.

1982 A*rcheological Assessment of Proposed Range Control Headquarters Building, Fort Wainwright, Alaska.* Manuscript on file at the U.S. Army Corps of Engineers, Alaska District.

1983 *Cultural Resource Assessment of Proposed Borrow Area, Fort Wainwright, Alaska.* Manuscript on file ant the U.S. Army Corps of Engineers, Alaska District.

Townsend, J.
1965 Ethnohistory and Cultural Change of the Iliamna Tanaina. Ph.D. Dissertation. Anthropology Department, UCLA, Los Angeles.

1970 The Tanaina of Southwestern Alaska: A Historic Synopsis. Western Canadian Journal of Anthropology 2(1):2-16.

1975 Alaskan Natives and the Russian-American Company: Variations in Relationships. In Proceedings of the Second Congress of Canadian Ethnology Society, Vol. 2, pp. 555-570. Ed. By Jim Freedman and Jerome Barkow. National Museum of Man. Mercury Series. Canadian Ethnology Service Paper No. 28, Ottawa.

1981 Tanaina in *Handbook of North American Indians, Vol. 6, Subarctic*, ed. By June Helm. Pp 623-640. Smithsonian Institute, Washington, D.C.

VanStone, J. W. and I. Goddard
1981 Territorial Groups of West-Central Alaska Before 1898. In *Handbook of North American Indians, Vol. 6: Subarctic*, edited by J. Helm, pp. 556-561. Smithsonian Institution, Washington, D.C

VanStone, J. and J. B. Townsend
1970 Kijik: An Historic Tanaina Indian Settlement. In *Fieldiana: Anthropology*, vol. 59.

Veltre, D.
1978 *Report to Chugach Electric Association: Archaeological Survey of Right-of-Way from University Substation to Knik Arm (East Terminal).* Manuscript on file at U.S. Army Corps of Engineers, Anchorage, AK.

Viereck, L.A. and E.L.Little Jr.,
1972 *Alaska Trees and Shrubs.* U.S. Department of Agriculture, Forest Service, Handbook No. 410.

Waddell, Karen.
2003 *Cold War Historical Context 1951-1991 Fort Richardson, Alaska: United States Army Alaska*. Center for Environmental Management of Military Lands, Colorado State University.

2000 *Cold War Resources Inventory: United States Army Alaska*. Center for Ecological Management of Military Lands, Colorado State University.

Wahrhaftig, C.
1965 *Physiographic Divisions of Alaska*. Professional Paper 482. U.S. Department of Interior, Geological Survey, Washington, D.C.

West, F. H.
1967 The Donnelly Ridge Site and the Definition of an Early Core and Blade Complex in Central Alaska. In *American Antiquity* 32 (2): 360-382.

1975 Dating the Denali Complex. In *Arctic Anthropology* 12:76-81.

1981 *The Archaeology of Beringia*. New York: Columbia Press.

Workman, W. R.
1978 *Prehistory of the Aishishik-Kluane Area, Southwest Yukon Territory*. Mercury Series Paper No. 74. Ottawa: National Museum of Man.

Yarborough, L. F.
1975 *Archaeology in the Delta Land Management Planning Study Area. Final Report*. Prepared for the Alaska Division of Parks, Anchorage.

1978 *Chena River Lakes Project Cultural Resource Investigation. Final Report.* Prepared for the U.S. Army Corps of Engineers, Alaska District.

Yaw Davis, N.
1994 *Draft Report—Ethnohistoric Land Use Patterns: Elmendorf Air Force Base (Knik Arm) Area, Alaska.* Prepared for the National Park Service and Elmendorf Air Force Base by Cultural Dynamics, Anchorage, AK.

Yesner, D. R., C. E. Holmes and G. Pearson
1999 *Recent Excavations at the Broken Mammoth Site, Big Delta, Alaska: Reflections on Activity Patterning and Artifact Assemblages*. Paper Presented at the 64th Annual Meeting of the Society of American Archaeology, Chicago.

APPENDIX 1: Obsidian Analysis

Obsidian is an exotic lithic material, the particular characteristics of which allow for chemical source determinations. During May, 2009, USAG FWA submitted 17 samples from five separate sites (FAI-00197; FAI-01885; FAI-00194; FAI-01356; and XMH-01377) for source analyses. Analyses consisted of either X-ray fluorescence (XRF) spectrometer and/or laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) (for a full discussion of the methods employed see Slobodin and Speakman 2008). The analyses were conducted at the Smithsonian Museum Conservation Institute laboratory by Chris Houlete under the direction of Robert Jeff Speakman.

Table 7. Characterization of obsidian artifacts from FAI-00197, FAI-01885, FAI-00194, FAI-01356, and XMH-01377

Site	AOD #	Catalog #	Artifact type	K	Mn	Fe	Zn	Ga	Th	Rb	Sr	Y	Zr	Nb	Rh	Source
FAI-00197	4082	NGain-001	Proj. Pt. tip	35468	380	8364	-5	14	11	105	90	20	141	10	0	Wiki Peak
FAI-01885	4083	NGain-002	Flake	33889	420	4470	-6	17	31	168	3	32	92	22	0	Batza Tena
XMH-01377	4084	NGain-003	Flake	35237	327	8213	-5	15	8	104	91	20	144	11	0	Wiki Peak
FAI-01356	4093	NGain-004	Flake	40315	414	6462	4	18	36	197	0	34	97	21	0	Batza Tena
FAI-01356	4094	NGain-005	Flake	40487	554	6149	2	18	31	182	0	32	90	20	0	Batza Tena
FAI-00197	4095	NGain-006	Flake	37990	345	11121	2	12	4	128	100	19	148	9	0	Wiki Peak
FAI-01356	4096	NGain-007	Flake	38887	528	6061	-1	18	33	201	2	35	104	23	0	Batza Tena
XMH-01377	4097	NGain-008	Flake	39110	390	9937	-4	13	6	112	99	19	149	8	0	Wiki Peak
FAI-01357	4098	NGain-009	Flake	36273	341	8913	-7	15	10	108	91	21	149	9	0	Wiki Peak
FAI-01885	4099	NGain-010	Flake	39077	484	5985	2	18	32	178	8	33	108	20	0	Batza Tena
FAI-00194	4100	NGain-011	Flake	43782	498	11291	9	14	11	163	29	36	330	13	0	N
FAI-00194	4101	NGain-012	Flake	35411	565	4523	-3	21	30	160	3	31	91	22	0	Batza Tena
XMH-01377	4102	NGain-013	Microblade	39563	445	5385	-7	17	28	177	-1	30	87	20	0	Batza Tena
XMH-01377	4103	NGain-014	Microblade	36643	606	7379	25	18	21	176	7	30	98	17	0	Batza Tena
XMH-01377	4104	NGain-015	Microblade	40279	499	5601	-1	16	33	194	2	34	94	19	0	Batza Tena
XMH-01377	4105	NGain-016	Microblade	39634	446	6031	2	19	31	197	-1	32	93	22	0	Batza Tena
XMH-01377	4106	NGain-017	Microblade	38514	535	6464	4	17	23	175	7	30	96	18	0	Batza Tena