CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

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ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes in detail the alternatives analyzed in this Legislative Environmental Impact Statement (LEIS) and the alternatives considered and eliminated from further study; it also contains a comparison matrix summarizing the environmental impacts of the alternatives. Through the LEIS process, each alternative is analyzed by an interdisciplinary approach to determine the environmental consequences. This chapter clearly defines the alternatives, particularly the differences of their environmental impacts on the significant issues.

2.1 DETAILED DESCRIPTION OF ALTERNATIVES

The National Environmental Policy Act (NEPA) requires the preparer of an EIS to define and consider reasonable alternatives. Reasonable alternatives are those that are technically implementable. The Army developed possible alternatives for the renewal of the Alaska Army lands withdrawal based on the input received from various State and Federal resource agencies and the public during the scoping process.

NEPA requires a range of alternatives be analyzed in an EIS. Neither NEPA nor the Council on Environmental Quality Implementing Guidelines for NEPA defines range by indicating a specific number of alternatives. Rather, the nature of the project, the scope of proposed actions, and the differing levels of impacts all contribute to the definition of range.

The Army and Air Force reviewed the possible alternatives to determine the viability of the military achieving their mission in Alaska under these alternate options. Military operational parameters and training needs were used to determine if an alternative would satisfy the proposed action.

2.1.1 Military Operational Parameters and Training Needs

Training Needs

There are three general military land uses: (1) Cantonment or Main Post areas, (2) Impact Areas, and (3) Training Areas. The withdrawal renewal lands are utilized only for Impact Area and Training Area land uses.

Impact Areas are permanently designated areas where shelling, bombing, explosive demolition, and direct fire from weaponry occurs. Dedicated Impact Areas are permanently designated areas used to contain fired or launched ammunition and explosives and the resulting fragments, debris, and components. Dedicated Impact Areas are used for less sensitive ammunition and explosives; however, access is still strictly controlled due to the high risk to personnel. High Hazard Impact Areas are permanently designated within the Training Areas and used to contain high explosive ammunition and explosives and the resulting fragments, debris, and components. Access is limited and strictly controlled due to the extreme hazard of unexploded ordnance.

The two-mile wide area surrounding the Impact Area is the Buffer Zone. This zone serves as a barrier between the military activities occurring in the Impact Area and the surrounding areas. The Buffer Zone contains the safety fan of weapons fired at targets in the Impact Area. It provides a safe distance from explosive fragments, debris, and components resulting from live weapon expenditures into Impact Areas. For safety reasons, sections of the Buffer Zone are closed during military activities to military personnel and the public.

Training Areas are designated management areas where specific training and testing occurs. Military use of Training Areas includes maneuver activities, bivouac, foot-use, firing points, firing ranges, drop zones, airstrips, road corridors, and testing of equipment.

Areas used for maneuvering generally provide easy cross-country movement. Military activities conducted on Training Areas include offensive and defensive operations, and tactical movement.

Areas used for bivouac operations are where training units consolidate and rest/recover for a period of time. Bivouac activities include assembly area operations, combat service support operations, and unit security and defense operations.

Foot-use activities often are conducted on areas that prevent vehicular movement. They are dense forests, steep terrain, and wetlands. Foot-use areas are used by units conducting tactical movement and land navigation without vehicles.

Drop Zones or Landing Zones are cleared areas used for inserting troops and equipment. Military activities include airborne assault, air assault in support of combined arms, aeromedical evacuation, and rotary wing aircraft landing zones.

Ranges are facilities for weapons firing, demolition, and assault courses usually containing buildings or berms. Military use includes the training and testing of direct fire weapons, hand grenades, demolitions, air-to-ground exercises, and Military Operations in Urban Terrain (MOUT) exercises.

Firing Points are areas from which multiple types of weapon systems are fired. These areas are usually cleared of vegetation and designated with survey markers.

Assault airstrips are facilities used for aircraft landing and take-off operations. They have unpaved surfaces.

Road corridors and trails are access ways maintained for military operations.

Military Operational Parameters

Technological changes in warfare have had a significant impact on training concepts and the space required to conduct effective training. Training involves the management of a three dimensional battlefield, including artillery, missiles, and attack and assault helicopters combined with Air Force air support.

Available training acreage should represent the scale of the modern battlefield. Acreage available on installations for maneuvering may be limited due to Ranges, Impact Areas, untrafficable terrain, Main Post (built-up) areas, and protected areas.

Further restrictions to available maneuver land result from the extensive safety zones that apply to direct and indirect fire weapons ranges. Safety zones contain the surface danger areas and firing limits of munitions. The size of the safety zone varies according to the weapon and munition fired. These zones restrict the amount of available maneuver land when weapons are being used.

Training land requirements are dependant upon the type of unit using the land, their mission, and type of terrain available. Types of units include armored, mechanized infantry, light infantry, air assault, or airborne. Approximate unit troop strengths are:

Platoon	30 - 50 soldiers
Company/Squadron/Troop	100 - 300 soldiers
Battalion	500 - 1,000 soldiers
Brigade	2,000 - 6,000 soldiers
Division	15,000 - 18,000 soldiers

The brigade (Brigade Combat Team) is the lowest echelon (level) where all battlefield operating systems can be integrated and synchronized. The brigade needs sufficient acreage to realistically deploy its maneuver battalion task forces and to position brigade combat support and combat service support elements.

The battalion is the lowest echelon at which all elements of the combined arms team effectively fight together. It is the focus of the battle in combat. While training emphasis is focused on the battalion level, brigade-sized units need to practice performing major tactical missions in division-sized battles (DA 1991).

Required acreage to complete training tasks are defined as maneuver boxes. Maneuver box areas combine maximum effective weapon ranges with maneuver frontage and depth requirements. The maneuver box is a conceptual template, the size of which must be adapted to particular terrain and battlefield conditions. These area requirements are multiplied by the unit density, the number of repetitions to complete to maintain proficiency, and the number of days per iteration. A brigade-sized maneuver box ranges from 16 x 32 km (126,515 acres) for an isolated training event to 16 x 48 km (189,773 acres) for a flowing scenario training event. A maneuver box for a light brigade unit is 12 x 32 km (94,886 acres). A heavy battalion task force requires a land area of 31 x 8 km (61,256 acres), while a light battalion task force maneuver box is 6 x 32 km (47,443 acres). A division-sized area of operations may range between 2-5 million acres (DA 1991).

2.1.2 No Action Alternative

The No Action Alternative would occur if Congress does not grant the requested withdrawals. These lands would no longer be available for military use after November 5, 2001. The resulting effect on military operations would include a reduction in cold temperature related defense preparedness. The extent of this reduction would be dependent on whether viable substitute lands are available.

After November 5, 2001, the Secretary of Defense would determine the extent the lands are contaminated with explosive, toxic, or other hazardous materials. If the lands are contaminated, the Secretary of the Interior and Secretary of Army would determine if decontamination is practicable and economically feasible. The Secretary of the Army would decontaminate the lands to the extent funds are appropriated for that purpose. If the Secretary of the Interior and Secretary of the Army determine that the lands cannot be decontaminated sufficiently to be opened under public land laws, or it is not practicable or economically feasible to decontaminate, or Congress does not appropriate sufficient funds for the decontamination, the Secretary of the Interior would not be required to accept these lands. The Secretary of the Army must warn the

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After November 5, 2001, the Secretary of Defense would determine the extent the lands are contaminated with explosive, toxic, or other hazardous materials. If the lands are contaminated, the Secretary of the Interior and Secretary of Army would determine if decontamination is practicable and economically feasible. The Secretary of the Army would decontaminate the lands to the extent funds are appropriated for that purpose. If the Secretary of the Interior and Secretary of the Army determine that the lands cannot be decontaminated sufficiently to be opened under public land laws, or it is not practicable or economically feasible to decontaminate, or Congress does not appropriate sufficient funds for the decontamination, the Secretary of the Interior would not be required to accept these lands. The Secretary of the Army must warn the

public of the contaminated state of the lands and any risks associated with entry onto the lands (Public Law 99-606, Section 8).

Decontaminated land will remain withdrawn from all forms of appropriation, including location and entry under the mining laws and from leasing under the Mineral Leasing Act until further classified by the Bureau of Land Management (BLM). The land would be managed by the BLM under its existing Resource Management Plans until new plans could be developed.

These lands have been selected as general grant lands by the State of Alaska under Section 6(b) of the Alaska Statehood Act and Section 906(e) of the Alaska National Interest Lands Conservation Act (ANILCA) (Public Law 96-487). If the military withdrawal expires and the lands are decontaminated sufficiently to be opened under public land laws, the State selections would become valid and the lands would be adjudicated by the BLM for conveyance of the lands to the State of Alaska subject to valid existing rights (Alaska Department of Natural Resources 1992). It is impossible to predict the likelihood these lands would be adjudicated to the State. For the analysis in this LEIS, we assumed the lands would be adjudicated.

The Fort Wainwright Yukon Training Area was selected by the State for recreation and community development and for its various resource values. The State has assigned the Stuart Creek Impact Area as a low priority selection, with the remainder of the Yukon Training Area either a high or moderate selection. The State ranks the Yukon Training Area as moderate for mineral potential and forest values and considers portions of the Yukon Training Area to contain high value habitat for black bear, moose, and fish. The State considers the northeast portion of the Training Area as a high potential for addition to the Chena River State Recreation Area, due to the trail and road access, which would provide for heavy recreational use. The State also feels there is potential for agricultural homesteads in portions of the Yukon Training Area and high potential for settlement near the Richardson Highway with moderate potential along the Little Salcha River (Figure 2.a) (Alaska Department of Natural Resources 1992).

Fort Greely was selected by the State for its mineral, wildlife, recreation, and forestry values west of the Delta River and its wildlife, settlement, and transportation resources east of the Delta River. The State considers the potential for agriculture to be moderate to high along the Richardson Highway and near Delta Junction. The State has assigned the area east of the Delta River as a high priority selection and the land west of the Delta River as a moderate to low selection. The Impact Areas are assigned a low priority selection (Figure 2.a) (Alaska Department of Natural Resources 1992).

2.1.3 Preferred Alternative: Renew Alaska Army Land Withdrawals For Fifty Years

Renew existing military withdrawals for 50 years, until November 6, 2051. The proposed 50 year withdrawal period is approximately the same length of time the military will have used these lands when the existing withdrawals expire in 2001. The Army's selection of a 50-year renewal period is based on requirements of substantial land mass to support training of soldiers in Arctic and Subarctic environments which will continue to be critical to national defense preparedness in the future. A creditable operational military planning horizon is limited by withdrawal renewals every 10 to 15 years. Moreover, the resource commitment, both dollars and personnel, required for renewal every 10 to 15 years places a substantial burden on the Army. Considering the large costs to prepare this LEIS to continue existing operations, U.S. Army Alaska is proposing to lengthen the withdrawal period and utilize resources (both dollars and personnel) to protect resource values and implement natural resource management measures.

Military activities conducted on the withdrawal renewal lands would be consistent with those conducted during the past 15 years (see following sections). The Army is proposing to renew the withdrawal areas with the existing military land uses. The Army is not proposing to expand or add Impact Areas on the withdrawal lands.

Subject to valid existing rights, these lands would be withdrawn from all forms of appropriation under the public land laws (including the mining laws and the mineral leasing and the geothermal leasing laws), under An Act to Provide for the Admission of the State of Alaska into the Union, approved July 7, 1958 (Public Law 85-508), and under the Alaska Native Claims Settlement Act (Public Law 92-203). These lands would be reserved for use by the Secretary of the Army for military maneuvering, training, equipment development and testing, and other defense-related purposes.

During the withdrawal period, the Secretary of the Interior would manage the lands subject to conditions and restrictions necessary to permit the military use of these lands. Management of these lands would follow the Integrated Natural Resources Management Plans currently being developed by the Army with concurrence from the BLM. The Secretary of the Army would close any road, trail, or portion of the lands to public use if necessary for public safety, military operations, or national security. The Secretary of the Interior would issue a lease, easement, right-of-way, or authorization for nonmilitary use of these lands with the concurrence of the Secretary of the Army. Hunting, fishing, and trapping on these lands would be permitted in accordance with the provisions of *Military*

Reservations and Facilities: Hunting, Fishing, and Trapping (Section 2671 of Title 10, United States Code).

2.1.3.1 U.S. Army Alaska (USARAK)

The primary military mission of U.S. Army Alaska (USARAK) after the Cold War has been peacetime deployment to support United States interests worldwide and the defense of Alaska. Fort Richardson, located near Anchorage, is the command headquarters for all Army forces in Alaska. Fort Wainwright and Fort Greely are satellite installations of Fort Richardson. Two-thirds of USARAK's combat forces are stationed at Fort Wainwright (Table 2.a).

Fort Wainwright has the fourth largest military training area in the United States. A land use permit with the State of Alaska allows the Army to construct a winter trail between the Tanana Flats Training Area on Fort Wainwright and the Fort Greely West Training Area. This provides the Army the ability to maneuver between the two installations in the winter, thereby linking over 1.2 million acres of training land.

Other military units in Alaska use the withdrawal renewal lands for training. Table 2.a lists the units' strength and location.

Table 2.a Units Utilizing Withdrawal Renewal Lands.

Unit	Authorized	Assigned	Location
USARAK	6,928	6,557	
Fort Greely	298	299	Fort Greely
Fort Richardson	2,158	2,114	Fort Richardson
Fort Wainwright	4,472	4,144	Fort Wainwright
Air Force	9,653	9,346	
Eielson Air Force Base	2,823	2,668	Eielson Air Force Base
Elmendorf Air Force base	6,830	6,678	Elmendorf Air Force Base
U.S. Army Reserve			
B Company, 411Th	66	47	Fort Richardson
Engineer Battalion	32	35	Fort Wainwright
11020D Garrison Support Unit	81	65	Fort Richardson
1984th Hospital Detachment	68	68	Fort Richardson
Alaska Army National Guard	2020	1,925	Fort Richardson
Alaska Air National Guard	1,925	1,892	Kulis Air National Guard Base
U.S. Marine Corps			
E Company, 4th Reconnaissance	85	94	Elmendorf Air Force Base
Instructor and Inspection Staff	12	12	Elmendorf Air Force Base
17th Coast Guard District	1,832	1,832	Various Locations

Fort Greely was designated by Congress to be realigned under the Base Realignment and Closure-1995 (BRAC). The BRAC process is scheduled to become final in July 2001. Approximately 1,800 acres of Main Post may be transferred under appropriate BRAC procedures. This area contains most of the buildings on Fort Greely. Under BRAC, the Cold Regions Test Center and the Northern Warfare Training Center will relocate to Fort Wainwright. This will reduce the number of civilian employees at Fort Greely from about 300 to approximately 50-60, and the number of military personnel from about 300 to about 11. The primary missions of the Cold Regions Test Center and Northern Warfare Training Center will continue to be conducted on Fort Greely, and military units will continue to use Fort Greely for training after the BRAC process becomes final.

See Appendix 2.A for a complete demographic listing of combat forces stationed at Fort Wainwright and Fort Greely.

Fort Wainwright Yukon Training Area
Army Facilities

The Yukon Training Area is divided into seven Training Areas and contains the Stuart Creek Impact Area and Buffer Zone. Along the road network, near the Stuart Creek Impact Area, there are 20 firing points for indirect fire weapons and one assault airstrip (unimproved runway with a dirt surface). A Military Assault Course (MAC) Range exists south of the Stuart Creek Impact Area. In the western portion of the Training Area is the Husky Drop Zone and a Biathlon Course. Two Prohibited Tactical Training Areas are designated in the Training Area on withdrawal renewal land. One covers the former Pine Creek Mining Claim (approximately 92 acres) and the other is adjacent to the Chena River Recreation Area (approximately 13,440 acres). Two Small Arms Ranges are on the Training Area but are not on the withdrawal renewal land. Two former NIKE surface-to-air missile battery sites are located southwest of the Impact Area. One of these dismantled sites is used as operating and support areas for Air Force electronic threat emitters. Both sites were withdrawn under separate Public Land Orders so are not included in this withdrawal renewal action (see Figure 2.b).

The Stuart Creek Impact Area is a High Hazard Impact Area covering approximately 25,240 acres within the Fort Wainwright Yukon Training Area. It is used by both Army and Air Force personnel for aerial gunnery, bombing, surface-to-air, air-to-surface, and direct and indirect firing exercises. All munitions, except small arms, fired by the Army from a Training Area, or fired by the Air Force from Restricted Area R2205, must detonate within the Stuart Creek Impact Area. Area R2205 has been designated as a Restricted Area by

the Federal Aviation Administration and is closed to all aircraft up to an altitude of 20,000 feet above mean sea level during periods of scheduled activity.

Army Use

The Yukon Training Area has sustained a variety of military activities on its lands in support of its military mission. Light infantry, mechanized infantry, artillery, special forces, and assault aircraft have used the Yukon Training Area for training. The Training Area is suitable for artillery and mortar indirect fire weapons, aerial gunnery, small arms, platoon to brigade exercises, road marches, and bivouacs. The Training Area is used year-round for military training. However, military access is largely limited to the road system due to the steepness of terrain and thick vegetative cover. Stuart Creek Impact Area is the only Impact Area in Alaska that allows continued year round use that is not restricted by fire indicies. Except for major exercises, the majority of training is conducted in the Yukon Training Area.

Army use data were compiled for the Fort Wainwright Yukon Training Area from Range Control records. Range Control data were only available for 1995 and 1996 (O'Neal, pers. com. 1998). Table 2.b shows the total number of days facilities were used on the Yukon Training Area for each year. Appendix 2.B contains a complete listing of military use for 1995 and 1996 by month and activity.

Table 2.b Army Use by Number of Soldier Days of Fort Wainwright Yukon Training Area (Fort Wainwright Range Control Records). If a facility is not listed, it was not used during 1995-1996.

AREA	1995	1996	TOTAL	AVERAGE
BIATHLON COURSE	35	22	57	29
FIRING POINT 3	0	3	3	2
FIRING POINT 5	0	26	26	13
FIRING POINT 7	64	31	95	48
FIRING POINT 8	32	19	51	26
FIRING POINT 9	118	62	180	90
FIRING POINT 10	24	4	28	14
FIRING POINT 12	0	21	21	11
FIRING POINT 16	0	14	14	7

Table 2.b Army Use by Number of Soldier Days of Fort Wainwright Yukon Training Area (Fort Wainwright Range Control Records). If a facility is not listed, it was not used during 1995-1996.

AREA	1995	1996	TOTAL	AVERAGE
FIRING POINT 19	4	4	8	4
FIRING POINT 20	72	52	124	62
FIRING POINT 21	0	1	1	1
HUSKY DROP ZONE	81	104	185	93
TRAINING AREA 1	38	82	120	60
TRAINING AREA 2	171	136	307	154
TRAINING AREA 3	32	15	47	24
TRAINING AREA 4	152	181	333	167
TRAINING AREA 5	45	33	78	39
TRAINING AREA 6	7	4	11	6
TRAINING AREA 7	56	9	65	33
CAM SITE II-OBS PT	13	38	51	26
TAC II-OBS POINT	32	42	74	37
TAC III-OBS POINT	0	21	21	11

Fort Greely West and East Training Areas

Army Facilities

Fort Greely West Training Area is divided into 15 Training Areas and seven Impact Areas which support 13 Firing Ranges. The Training Areas were established to support battalion-sized operations under varying terrain conditions. The Training Areas west of the Delta River can support brigade or task force-sized maneuvers or operations. The Delta River runs through the Donnelly Training Area, making it an excellent but challenging area for river crossing operations during the entire year. The Delta River is usually frozen from November to April, allowing for easier access to the western Training Areas. Each of the 15 Training Areas have excellent unimproved air assault landing zones for rotary wing aircraft, facilitating the employment of air assault operations (Figure 2.c).

All 13 Firing Ranges are located in the West Training Area, to the east of the Delta River. Eight of the ranges are improved with target frames, firing berms, stationary targets, target drone equipment, firing or helicopter pads, and/or buildings. Five ranges are unimproved with no facilities. Four ranges are located within the Allen Army Controlled Fire Area established by the Federal Aviation Administration (FAA). Aircraft access over the area is not restricted when firing occurs. Spotters report approaching aircraft and firing is stopped.

The Joint Combined Arms Live Fire Complex (CALFEX) is located in Training Area 77, overlooking the Oklahoma/Delta Creek Impact Areas. The range complex consists of Air Force convoy targets, landing zone with targets, a drop zone, buildings, collapsible targets, and vehicles. The complex is designed to employ a wide range of weapon systems in support of an infantry company assault.

Impact Areas cover 156,804 acres on the Fort Greely West Training Area. All Impact Areas are dedicated with 85,042 acres classified as High Hazard Impact Areas (Figure 2.c). The Oklahoma Impact Area is centrally located within the West Training Area, providing excellent observation from many directions on the varying terrain. Impact Areas east of the Delta River are designated as live fire ranges only. Maneuver units operate in these ranges only during live fire exercises. The Kansas, Arizona, Nevada, Oregon, and Michigan Lakes Impact Areas are used for limited periods and are normally used for non-dud producing ammunition or explosives, which are cleared and returned to other training support following termination of firing. All Impact Areas are surrounded by a Buffer Zone extending to a width of two miles or to the installation boundary.

Thirteen Observation Points along the east side of the Delta River provide overlapping views of the Impact Areas. They are used for observation of firing of medium and long range artillery, guided missile, and rocket firing tests to provide a precise determination of the impact or air burst of ammunition fired through triangulation.

The Fort Greely East Training Area contains six Training Areas that are subdivided into 15 sub-Training Areas, six Drop Zones, and two Combat Assault Strips. The East Training Area is used primarily as a nonfiring maneuver area. The Drop Zones are used for airborne testing or training operations, with Donnelly Drop Zone supporting a battalion airborne operation. All Drop Zones are cleared of vegetation and have maintained surfaces. Donnelly Assault Strip is graded and maintained. The Cold Regions Test Center uses the East Training Area for experimental airdrops, airborne testing, and testing of clothing, vehicles, and equipment (Figure 2.c).

The Bolio Lake Test Complex was specifically designed to accommodate the Cold Regions Test Center's (CRTC) test mission. It is located in the West Training Area in a bowl-like setting where the coldest temperatures on Fort Greely occur. The complex contains office facilities, maintenance garages, storage buildings, and overnight accommodations to provide an ideal base of test operations.

The Mississippi Test Site is used by the Cold Regions Test Center as a general purpose test facility. Its facilities accommodate large scale demonstrations of ordnance delivery in the adjacent Mississippi Impact Area (Figure 2.c).

Army Use

Units stationed at Fort Wainwright and Fort Richardson use Fort Greely for military training and will continue after the realignment is completed in July 2001. Its lands are used for testing and evaluating weapons and equipment under conditions of extreme cold and training forces for military action in Arctic and Subarctic regions. Major units located at Fort Greely are the Cold Regions Test Center and the Northern Warfare Training Center. The primary missions of the Cold Regions Test Center and Northern Warfare Training Center will continue to be conducted on Fort Greely after the BRAC process becomes final.

The Fort Greely West Training Area is a large contiguous training area containing a substantial Impact Area that supports the firing of most conventional weapons in the Army's inventory. Weapons may be fired from Firing Points in the West Training Area into the Impact Areas, or from just about any other location. Complete 365° direction of firing is available. Weapons training and testing includes, but is not limited to, small arms, mortars, artillery up to 155 mm howitzers, and rockets, both air and ground delivered.

Battalion and larger-sized elements train at Fort Greely throughout the year. Training exercises include deployment of troops by truck, helicopter, or troop transport aircraft, field bivouac, foot use, construction of temporary fighting or defensive positions, tactical movement, weapons firing, maneuvering with tracked and wheeled vehicles, and infantry tactical maneuvers.

Fort Greely is used for annual joint-readiness training exercises. These typically involve 10,000 to 14,000 troops for division exercises and 3,000 to 5,000 for brigade exercises. These exercises involve the use of other Alaskan installations, but the main battlefield has been on Fort Greely.

Army use data were compiled for Fort Greely West and East Training Areas from Range Control records. Range Control data were available from 1988 through

1995. Table 2.c shows the total number of days facilities were used on the Training Areas for each year. Appendix 2.B contains a complete listing of military use from 1988 through 1995 by month and activity.

Table 2.c Army Use in Number of Soldier Days of the Fort Greely West and East Training Areas (Fort Greely Range Control Records). If a facility is not listed, it was not used during 1988-1995.

AREA	1988	1989	1990	1991	1992	1993	1994	1995	TOTAL	AVERAGE
Training Area										
TA4	7	13	44	7	34	101	25	8	239	30
TA5	7	13	38	39	34	101	27	0	259	32
TA6	75	212	126	35	44	132	23	5	652	82
TA7	65	212	128	24	42	112	23	5	611	76
TA8	4	0	8	19	1	61	23	0	116	15
TA9	11	0	38	29	11	71	23	0	183	23
TA10	4	0	44	24	11	71	23	0	177	22
TA11	1	13	38	24	1	74	163	177	491	61
TA13	0	0	0	0	0	16	23	0	39	5
TA14	0	10	6	0	0	16	23	0	55	7
TA15	0	0	0	0	0	16	23	0	39	5
TA16	0	53	95	30	65	142	130	13	528	66
TA17	0	53	70	30	65	136	130	19	503	63
TA19	0	43	64	30	190	196	364	195	1082	135
TA20	0	10	127	60	137	172	262	5	773	97
TA21	63	143	267	263	429	316	253	128	1862	233
TA22	63	143	235	255	429	438	474	121	2158	270
TA32	0	0	0	0	0	16	16	0	32	4
TA36	0	0	0	0	0	16	0	0	16	2
TA37	0	0	0	0	0	16	0	0	16	2
TA38	0	0	0	0	0	16	0	0	16	2
TA39	0	0	0	0	0	16	0	0	16	2
TA40	93	104	77	0	0	16	0	0	290	36
TA46	0	0	0	0	0	0	7	0	7	1

Table 2.c Army Use in Number of Soldier Days of the Fort Greely West and East Training Areas (Fort Greely Range Control Records). If a facility is not listed, it was not used during 1988-1995.

AREA	1988	1989	1990	1991	1992	1993	1994	1995	TOTAL	AVERAGE
TA48	93	104	163	30	65	398	242	7	1102	138
TA49	13	17	92	31	151	360	175	0	839	105
TA50	0	17	43	46	187	330	127	0	750	94
TA51	0	17	50	16	37	187	132	0	439	55
TA52	0	27	50	16	68	298	196	0	655	82
TA53	0	27	108	16	73	310	347	24	905	113
TA54	0	122	150	83	301	105	225	10	996	125
TA55	92	242	195	83	49	69	6	0	736	93
TA56	0	122	125	53	104	62	141	39	646	81
TA57	0	132	148	79	263	109	253	39	1023	128
TA58	0	132	206	142	251	369	214	196	1510	189
TA59	0	132	139	149	360	411	365	189	1745	218
TA60	0	24	115	63	99	316	611	266	1494	187
TA61	0	40	73	94	97	271	522	194	1291	161
TA62	0	40	77	12	121	276	634	211	1371	171
TA63	0	30	164	53	33	166	102	3	551	69
TA71	0	0	0	0	0	1	0	0	1	0
TA72	0	0	0	4	0	0	0	0	4	1
TA75	0	0	0	0	1	0	0	0	1	0
TA77	0	0	0	0	0	0	0	13	13	2
TA86	0	0	7	0	0	0	0	0	7	1
Firing Point										
FP ARKANSAS	0	0	0	59	0	0	0	0	59	7
FP ARTY	0	0	0	31	0	0	0	0	31	4
FP AUDREY	21	0	12	88	102	0	51	19	293	37
FP BELUGA	0	0	0	4	0	0	0	0	4	1
FP BIG LAKE	107	130	11	87	24	0	51	31	441	55

Table 2.c Army Use in Number of Soldier Days of the Fort Greely West and East Training Areas (Fort Greely Range Control Records). If a facility is not listed, it was not used during 1988-1995.

AREA	1988	1989	1990	1991	1992	1993	1994	1995	TOTAL	AVERAGE
FP BOODLE	9	0	0	0	0	0	0	0	9	1
FP BO-WHALE	25	78	15	63	24	0	58	31	294	37
FP BRUCE	0	0	0	59	0	0	0	0	59	7
FP DEBORAH	3	0	0	0	0	0	0	0	3	0
FP DOC LAKE	0	26	0	0	0	0	0	0	26	3
FP H	4	0	0	0	0	0	0	0	4	1
FP HILLBILLY	9	0	0	59	0	0	0	0	68	9
FP ICE	9	0	0	0	0	0	0	0	9	1
FP LAKES	3	0	0	0	0	0	0	0	3	0
FP LEE	0	0	0	59	0	0	0	0	59	7
FP MARK	17	0	2	63	24	0	35	12	153	19
FP MT HAYES	13	52	0	59	14	0	47	19	204	26
FP MUSHY	0	26	0	0	0	0	0	0	26	3
FP RAY	0	0	0	88	0	0	0	0	88	11
FP SALLY	14	0	38	91	83	5	56	12	299	37
FP SAM	9	0	0	0	0	0	0	0	9	1
FP WHITEROW	9	0	0	0	0	0	0	0	9	1
Drop Zone										
BEAR DZ	0	0	3	120	365	105	4	26	623	78
BUFFALO DZ	16	44	77	24	75	115	35	17	403	51
BUTCH DZ	1	13	15	0	42	20	31	4	126	16
DELTA DZ	0	0	0	0	0	26	0	0	26	3
DONNELLY DZ	1	0	16	24	203	182	90	59	575	72
EDDY DZ	0	0	14	6	41	0	2	0	63	8
FOX DZ	0	30	0	6	76	4	10	8	134	17
PUMP DZ	0	0	0	0	31	0	0	0	31	4
RAMP DZ	0	0	0	0	0	0	10	10	20	3

Table 2.c Army Use in Number of Soldier Days of the Fort Greely West and East Training Areas (Fort Greely Range Control Records). If a facility is not listed, it was not used during 1988-1995.

AREA	1988	1989	1990	1991	1992	1993	1994	1995	TOTAL	AVERAGE
SALLY DZ	0	0	8	2	32	30	13	0	85	11
TEXAS DZ	0	0	0	0	0	0	5	0	5	1
VIC DZ	0	0	3	0	0	0	0	0	3	0
Assault Strip										
BENNET AS	0	0	0	2	0	0	0	0	2	0
DONNELLY AS	33	0	104	103	186	85	184	0	695	87
Other										
BOLIO SKI TRAILS	92	120	0	0	0	0	0	0	212	27
CALFEX BOWL	0	0	0	0	31	19	5	0	55	7
DONNELLY LZ	0	0	0	0	0	0	16	31	47	6
WINTER TRAIL	61	90	0	0	0	0	0	0	151	19
Observation Point										
OP3	14	15	0	46	0	0	0	0	75	9
OP4	14	0	0	47	0	15	16	0	92	12
OP5	17	0	0	52	31	172	8	0	280	35
OP6A	0	0	0	84	2	32	35	0	153	19
OP6	32	14	8	152	259	130	95	27	717	90
OP7A	70	8	74	164	43	134	219	254	966	121
OP7	57	8	59	155	34	118	45	23	499	62
OP8	63	2	69	154	41	102	148	97	676	85
OP9A	0	0	0	0	0	0	0	0	0	0
OP9	24	37	55	138	27	41	19	15	356	45
OP10A	14	0	0	31	0	2	12	9	68	9
OP10	1	26	0	207	154	7	0	1	396	50
OP11	9	29	90	117	211	1	0	4	461	58
OP12	14	0	0	115	211	0	0	0	340	43

Table 2.c Army Use in Number of Soldier Days of the Fort Greely West and East Training Areas (Fort Greely Range Control Records). If a facility is not listed, it was not used during 1988-1995.

AREA	1988	1989	1990	1991	1992	1993	1994	1995	TOTAL	AVERAGE
OP26	154	90	5	31	12	54	1	29	376	47
OP27	0	0	0	0	12	1	0	15	28	4
OP28	0	0	0	0	0	1	0	0	1	0
OP31	14	0	0	31	0	0	0	0	45	6
OP H	22	0	0	31	0	0	0	0	53	7
OP LAKE	4	0	0	31	0	0	13	0	48	6
OP LAKES	0	0	0	0	0	4	0	0	4	1
OP ROAD	0	0	0	0	0	0	0	5	5	1

The Cold Regions Test Center is responsible for testing vehicles, weapon systems, clothing and individual equipment under conditions of extreme cold. The Center is charged with planning, conducting, and reporting on environmental phases of development tests; and providing advice and guidance on test and evaluation matters to material producers, other armed services, and private industry. Major field evaluations are conducted on all types of wheeled and tracked vehicles, including cross-country mobility during summer and winter; trail breaking operations; difficult terrain performance; durability; reliability; petroleum, oil, and lubricant consumption; and maneuverability. Weapon systems, clothing, and individual equipment are tested and evaluated to determine their effectiveness and successful operation during the extreme challenges of winter warfare.

The Cold Regions Test Center is the only Department of the Army facility that tests outside at temperatures below freezing. All military equipment should be designed and tested to a Basic Cold (-5°F to -25°F) level. Special equipment for northern regions is designed and tested to Cold (-25°F to -50°F) and occasionally Severe Cold (below -50°F) levels. Successful cold weather testing requires at least a six hour block of time for setup; testing, which could extend for several days; and evaluation, during which ambient temperatures must remain within test parameters. Fort Greely's climate provides Cold level testing from October through March, with temperatures reaching Severe Cold level testing during that time period. Fort Greely's winter season allows a longer period for repetitive, rigorous testing to ensure all components have been adequately and properly assessed (CRTC 1997).

The Northern Warfare Training Center is responsible for training military forces for action in Arctic and Subarctic regions. The Center trains individuals and units in Arctic and mountaineering skills. The Center conducts high-altitude search and rescue missions, tests and evaluates mountaineering techniques and equipment, and trains and equips the Military Mountaineering Team of the U.S. Army Mountain Team. Instruction in winter skills include snowshoe movement, all terrain skiing, route selection, risk management, and shelter construction. Summer skills instruction include technical climbing, fixed rope installations, glacier travel, stream crossing, route selection, and risk management.

2.1.3.2 U.S. Air Force

The U.S. Air Force is a major user of Fort Wainwright and Fort Greely. The Department of Defense has identified the Stuart Creek and Oklahoma/Delta Creek Impact Areas as the primary sites for military aircraft air-to-ground training. The Air Force conducts air-to-ground training in the restricted airspace (R2202 and R2205) over the Training Areas. R2205, over the eastern portion of the Fort Wainwright Yukon Training Area, is the primary tactical air-to-ground weapons range for the Air Force in Alaska. With the recent addition of Military Operations Areas, tactical operations are also conducted in and around R2202 (Figures 2.d and 2.e) (USAF 1992, USAF 1995).

Restricted airspace R2205, over the Fort Wainwright Yukon Training Area, and R2202, over the Fort Greely West Training Area, have been designated Restricted Areas by the Federal Aviation Administration. R2205 is closed to all civilian aircraft up to an altitude of 20,000 feet above mean sea level during periods of scheduled activity. Restricted airspace R2202 is subdivided into three separate areas: R2202A, R2202B, and R2202C. R2202A and R2202B are closed to all civilian aircraft up to an altitude of 10,000 feet mean sea level during periods of scheduled activity. R2202C is closed from 10,000 feet mean sea level and above during periods of scheduled activity. R2202C is the exterior boundary of R2202A and R2202B.

The Stuart Creek, Oklahoma, and Delta Creek Impact Areas are equipped with mock enemy airfields, targets, manned radar emitters, anti-aircraft threat simulators, and electronic scoring sensors. Targets are constructed to simulate combat situations. Targets resemble helicopters, aircraft, hangars, tanks, bunkers, armored personnel carriers, and vehicles. They are constructed of plywood, steel drums, concrete, or salvaged metal vehicles. The mock enemy airfield consists of a runway, aircraft hangars, and airfield support areas. Radar emitters are used to simulate surface-to-air missile systems. The Television Ordnance Scoring System (TOSS) is used for electronic scoring of air-to-ground munitions.

The Air Force uses the Stuart Creek Impact Area and Oklahoma/Delta Creek Impact Areas for low and high altitude bombing by most aircraft in the current U.S. and allied forces inventory. The Stuart Creek and Oklahoma/Delta Creek Impact Areas support the firing of most conventional weapons in the Air Force's arsenal. Air Force weaponry training and testing includes aircraft machine gun, rockets, bombs, and air-to-ground missiles. Combining the Stuart Creek and Oklahoma/Delta Creek Impact Areas with surrounding Military Operations Areas provides the Air Force with a sophisticated training infrastructure comparable to other major training complexes.

The Air Force has installed the Yukon Measurement and Debriefing System on the Fort Wainwright Yukon Training Area and Fort Greely West Training Area. This computerized system displays air wars of up to 36 aircraft simultaneously. With this system, Air Force aircrews have the ability to view a mock air war real-time or evaluate their performance after landing on-screen. The re-creation of the mock war shows how the aircrews reacted to simulated enemy aircraft and ground threats, the level of success on bombing targets, and various other flying parameters.

The Air Force has a joint use agreement with the Army for the Air Force Technical Application Center (AFTAC) located in the Fort Wainwright Yukon Training Area. The Air Force maintains a group of seismic monitors on this site. The Army has joint use of 19,272 acres of this area with training restricted to foot and light vehicle maneuvers. The Army refrains from subterranean explorations and ordnance explosions, except for small arms. Heavy tracked vehicles are only allowed on Beaver Creek Road, which runs through the site. The Air Force has exclusive rights to the remaining 2,995 acres of the AFTAC site (Figure 2.d).

The Air Force is a major user of Fort Wainwright and Fort Greely for routine training and Major Flying Exercises (MFE). Routine training involves aircraft departing from their base, participating in training missions, and returning to their base. This scenario is called a sortie. While completing a sortie, participation in training missions could include one or more of the following: counter air, air interdiction, close air support, forward air control, or suppression of enemy air defenses. These missions would be completed within the Restricted Areas over the Fort Wainwright Yukon Training Area and Fort Greely West Training Area. Routine training activities occur an average of 240 days per year, including 60 days of MFE training (USAF 1995).

During an MFE, a combat scenario is developed and roles are given to participating aircraft. Ground forces position simulated air defenses throughout

the training area combined with airborne defenses, which provide a realistic air defense environment. During an MFE, aircraft typically accomplish two sorties per day. Normally, flight activity is conducted in a two to three hour flying window twice a day. Typically, one exercise occurs sometime between February and April, four exercises between May and August, and one exercise between October and November. Generally, an MFE runs for 10 flying days but could extend for a total of up to 15 flying days, not to exceed a total of 60 flying days per year. COPE THUNDER is an example of an MFE, conducted in Alaska with the closing of Clark Air Base, Philippines, in 1991 (USAF 1995).

A single aircraft typically uses only one range during a sortie. Daily range use during an MFE would be greater than during routine training as up to 60% of the aircraft involved in an exercise would be expected to use the air-to-ground weapon ranges. Approximately half would use Stuart Creek and half would use Oklahoma/Delta Creek Impact Areas. Table 2.d shows the average number of sorties completed during routine training and MFEs for each of the Restricted Areas (USAF 1995).

Table 2.d Total Number of Sorties and Days Used by the Air Force of the Restricted Airspace in the Fort Wainwright Yukon Training Area and Fort Greely West Training Area (Fort Wainwright and Fort Greely Range Control Records). Incomplete information indicates the data was not available.

Restricted Airspace	Oklahoma/Delta Creek						Stuart Creek	
	R2202A		R2202B		R2202C		R2505	
	Sorties	Days	Sorties	Days	Sorties	Days	Sorties	Days
1 Oct 90 - 30 Sept 91	223	101	2,073	241	2,251	250	--	--
1 Oct 91 - 30 Sept 92	2,587	224	3,430	247	3,112	236	--	--
1 Oct 92 - 30 Sept 93	967	279	1,439	242	904	242	4,491	275
1 Oct 93 - 30 Sept 94	2,748	207	2,748	122	2,748	207	3,299	235
1 Oct 94 - 30 Sept 95	4,201	301	4,152	249	4,152	249	3,082	231
1 Oct 95 - 30 Sept 96	3,674	219	4,101	232	4,099	247	2,602	251
1 Oct 96 - 30 Sept 97	6,170	234	6,170	222	6,036	238	--	254

The Stuart Creek and Oklahoma/Delta Creek Impact Areas are certified for laser operations. The range was studied and approved for use by Army ground-to-ground and Air Force air-to-ground lasers including the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN). LANTIRN is a highly sophisticated laser-based navigation and targeting system that provides high-resolution

infrared imagery for high-speed, low-altitude flight and precision air-to-ground weapons delivery during darkness and during some limited visibility conditions (USAF 1992). The LANTIRN system targeting pod has operational (combat) and training mode lasers. The training mode laser is "eye-safe" and is approved for unrestricted use throughout all Alaskan airspace (USAF 1995).

2.1.3.3 Fuels

Fuel on Fort Wainwright and Fort Greely is used to heat buildings and operate vehicles and aircraft. It is distributed directly to post users by private contractor tanker trucks. The Army uses several vehicular tankers (HEMTTs) and collapsible rubber containers for transporting aviation and other fuels to the field.

The Air Force has 31 above-ground storage tanks on the Fort Wainwright Yukon Training Area operated by a contractor, Lockheed Martin. All tanks are double-walled and store diesel or propane fuel. Most of the tanks have a 1,000 gallon capacity, one tank has a 5,000 gallon capacity, two have a 10,000 gallon capacity, and one has a 15,000 gallon capacity. All of the tanks were installed between 1992 and 1996. There are no underground storage tanks on the Fort Wainwright Yukon Training Area. The Spill Prevention Control and Countermeasure Plan for Fort Wainwright (1996) lists fuel spills of more than 100 gallons for 1985-1995. Spill reports since 1995 were reviewed for spills greater than 10 gallons (Table 2.e). All fuel spills on Fort Wainwright are remediated by implementing applicable U.S. Army regulations.

Table 2.e Fuel Spills on Fort Wainwright Yukon Training Area.

Date	Location	Amount	Type
Feb. 6, 1989	Husky Drop Zone	150 gallons	JP-4
Aug. 12, 1995	Yukon Training Area	805 gallons	DFA
Sep. 25, 1995	Hill 3265	300 gallons	Diesel Fuel 8
Dec. 7, 1995	C-Battery	30 gallons	Unleaded Gas
Oct. 4, 1996	C-Battery	10 gallons	Mogas

Fort Greely has 16 above-ground storage tanks on its withdrawal renewal lands. The storage tank capacities range from 500 to 5,000 gallons. All are used to store heating oil, fuel oil, diesel, or JP8. Five of the tanks were installed between 1987 and 1994. It is not known when the other tanks were installed.

There are three underground storage tanks on the Fort Greely West Training Area at the Bolio complex. Two were installed in 1989. Two tanks store used oil

and have a 500 gallon capacity. The other tank stores diesel fuel and has a 15,000 gallon capacity.

The Spill Prevention Control and Countermeasure Plan for Fort Greely (1996) lists fuel spills of more than 55 gallons for 1986 to 1993. Spill reports since 1993 were reviewed for spills of greater than 10 gallons (Table 2.f). All fuel spills on Fort Greely are remediated by implementing applicable U.S. Army regulations.

Table 2.f Fuel Spills on Fort Greely's Withdrawal Renewal Lands.

Date	Location	Amount	Type
Jan. 13, 1986	Mississippi Range	1,000 gallons	JP-4
Dec. 22, 1986	Texas Range	150 gallons	Diesel
Nov. 2, 1987	Donnelly Flats	1,500 gallons	Diesel
Jan. 17, 1989	Beales Range	1,400 gallons	Diesel
Dec. 9, 1990	Texas Range	1,500 gallons	Diesel
Feb. 5, 1991	Hill No. 1825	60 gallons	DFA
May 26, 1991	Texas Range	250 gallons	Diesel
May 5, 1992	Texas Range	150 gallons	Diesel
May 14, 1993	Beales Range	100+ gallons	Diesel
June 1, 1993	Beales Range	unknown	Fuel Oil
Jan. 8, 1996	Donnelly Dome	190 gallons	Diesel
Feb. 13, 1996	Training Areas	15 gallons	Condensate
June 24, 1996	Texas Range	unknown	Diesel
Sep. 17, 1996	Donnelly Dome	25 gallons	JP-8
Dec. 7, 1996	Mississippi Range	unknown	JP-4
Feb. 19, 1997	Donnelly Dome	60 gallons	Diesel
July 21, 1997	Arkansas Range	50 gallons	DFA

2.1.3.4 Munitions

Munitions are stored on Fort Wainwright and Fort Greely for training and testing; storage facilities are not located on the withdrawal renewal lands. All firing on Ranges and from Firing Points is conducted to cause ammunition and explosives to detonate in a designated Impact Area. Impact Areas and their associated

Buffer Zones are the ground and associated airspace within the training complex used to contain fired or launched ammunition and explosives and any resulting fragments, debris, and components.

Five classes of munition have been fired into the Stuart Creek and Oklahoma/Delta Creek Impact Areas by the Army. These are high explosives, smokes, illumination rounds, small arms, and inert. Projectiles containing high-explosive compounds explode upon impact with the ground, creating a crater and spreading fragments of steel. Smoke projectiles burst in the air or on impact with the ground and create an intense smoke. Illumination rounds expel a flare attached to a parachute which illuminates a target area. The flare continues to burn on the ground or in water. Small arms and inert ammunition do not contain filler material. Munition expenditures by the Army for the Stuart Creek Impact Area and Oklahoma/Delta Creek Impact Area are contained in Tables 2.g and 2.h. Appendix 2.C contains the chemical composition of munitions fired into the Stuart Creek and Oklahoma/Delta Creek Impact Areas.

Table 2.g Muntion Expenditures by the Army in the Stuart Creek Impact Area, Fort Wainwright Yukon Training Area (Fort Wainwright Range Control Records). Ammunition data was only available for 1995 and 1996. For both years reported, Army records had 595 entries that ammunition was used in training, but 439 entries showed either no data, unknown, or not available. Therefore, ammunition expenditure amounts are considerably understated.

Ammunition	1995	1996	Total
High Explosives	7,630	44,971	52,601
Smoke	88	160	248
Illumination	1,852	4,096	5,948
Small Arms	91,710	122,430	214,140
Inert	11,870	576	12,446

Table 2.h Munition Expenditures by the Army in the Oklahoma/Delta Creek Impact Area, Fort Greely West Training Area (Fort Greely Range Control Records).

Ammunition	1992	1993	1994	1995	1996	1997	Total
High Explosives	4,815	13,298	2,868	5,506	2,440	2,675	31,602

Table 2.h Munition Expenditures by the Army in the Oklahoma/Delta Creek Impact Area, Fort Greely West Training Area (Fort Greely Range Control Records).

Ammunition	1992	1993	1994	1995	1996	1997	Total
Smoke	232	110	19	389	0	316	1,066
Illumination	92	5,460	1,586	417	507	1,431	9,493
Small Arms	92,951	335,039	301,739	209,590	148,916	68,032	1,156,267
Inert	5,592	1,880	1,306	1,333	0	348	10,459

The Air Force carries inert and live munitions during training flights for attacking the target formations in the Stuart Creek and Oklahoma/Delta Creek Impact Areas. The primary type of training munition expended by the Air Force is BDU-33 (excluding 20mm and 30mm ammunition). BDU-33 expenditures accounted for over 70% of the total munitions delivered in the withdrawal lands Impact Areas for the years reported in Tables 2.i and 2.j. This is a 25-pound or less practice bomb composed of ferrous metals and a small spotting charge equivalent to two shotgun shells (USAF 1995) Appendix 2.C contains the chemical composition of munitions fired into the Stuart Creek and Oklahoma/Delta Creek Impact Areas.

Table 2.i Munition Expenditures by the Air Force in the Stuart Creek Impact Area (Air Force records 1998).

Year	Machine Gun		Rocket	Practice Bomb	500lb Bomb	1000lb Bomb	2000lb Bomb	Missile
	20mm	30mm	2.75"	BDU-33	Mk-82	Mk-83	Mk-84	AGM-65
1992	5,430	12,410	551	4,308	1,158	0	79	5
1993	2,500	40,713	312	3,653	713	38	164	4
1994	5,370	27,680	660	3,730	613	69	149	0
Jan-Sep 95	1,040	22,840	93	2,130	206	0	4	0
Oct 95-Sep 96	7,683	43,537	348	2,734	230	0	131	0
Oct 96-Sep 97	2,300	68,360	1,552	3,010	736	0	74	0
Total	24,323	215,540	3,516	19,565	3,656	107	601	9

Table 2.j Munition Expenditures by the Air Force in the Oklahoma/Delta Creek Impact Areas, Fort Greely (Air Force records 1998).

Year	Machine Gun		Rocket	Practice Bomb	500lb Bomb	1000lb Bomb	2000lb Bomb	Missile
	20mm	30mm	2.75"	BDU-33	Mk-82	Mk-83	Mk-84	AGM-65
1992	8,302	11,950	976	5,176	268	122	28	6
1993	860	36,000	404	3,917	215	38	173	0
1994	8,250	33,300	985	3,441	679	53	70	0
Jan-Sep 95	2,050	26,960	221	2,226	122	16	100	6
Oct 95-Sep 96	4,450	18,020	66	1,759	193	0	20	7
Total	23,912	126,230	2,652	16,519	1,477	229	391	19

Current 11th Air Force policy allows for dispensing self protection chaff and flares in the Oklahoma/Delta Creek and Stuart Creek Impact Areas depending on current fire hazard conditions.

Chaff is used by the Air Force as a defensive mechanism to avoid detection by radar. Chaff is released from an aircraft and spreads in the air to form an electronic smoke screen that reflects radar signals. Chaff dispensers can be programmed to dispense bundles at intervals normally over a two minute period. Each bundle produces a spherical cloud approximately 300 to 600 feet in diameter. Chaff is composed primarily of silica (60%), an aluminum surface (approximately 39%), and a coating of stearic acid (approximately 1%) (USAF 1995).

Flares are small, intense heat sources used by the Air Force as a defensive mechanism to counter heat-seeking threats. Only self-protection flares are used by the Air Force in Alaskan special-use airspace. Self-protection flares are ejected by an aircraft to mislead the guidance systems of heat-sensitive or heat-seeking targeting systems. Flares are a composite of magnesium and Teflon. They are designed to burn completely within 4 to 5 seconds after deployment (USAF 1995).

2.1.3.5 Decontamination

Routine decontamination operations are conducted each year on the Stuart Creek and Oklahoma/Delta Creek Impact Areas by the Air Force. The Air Force's routine decontamination operations are conducted only on the portions of the Impact Areas they utilize for training. Each year, all unexploded ordnance

and inert residue are cleared to a radius of at least 1,000 feet from each of the Air Force's tactical targets. The access ways into the tactical targets and 100 feet on either side of the access ways are also cleared each year.

An estimate of the total cost to clear the Impact Areas on the withdrawal lands was generated based on the type of munitions used by the Army and Air Force and the size of the Impact Areas. The U.S. Army Corps of Engineers, Huntsville, Alabama estimated the total decontamination cost on the RACER Environmental Cost Engineering System Version 3.2A. The estimate was generated without an Archives Search Report and an Engineering Evaluation/Cost Analysis. The Archives Search Report would identify the actual areas used for military testing and training of munitions. The Engineering Evaluation/Cost Analysis Report would show the level of contamination and extent of necessary decontamination.

Estimated Decontamination Cost:

Oklahoma/Delta Creek Impact Area	$55,700,000.00
Washington Impact Area	$23,700,000.00
Lakes Impact Area	$75,000,000.00
Texas Impact Area	$24,100,000.00
Mississippi Impact Area	$23,000,000.00
Stuart Creek Impact Area	$47,400,000.00
Estimated Total Decontamination Cost	$248,900,000.00

Since military training and testing has occurred on these lands for nearly 50 years, with portions dedicated as High Hazard Impact Areas, it is likely that a complete decontamination would be extremely expensive and technologically challenging.

2.1.3.6 Existing Mitigation

The following programs have been implemented by the Army at Fort Wainwright and Fort Greely. The Army would continue these programs for the duration of the withdrawal renewal to provide mitigation for achieving the military's mission while offering environmental protection. Each resource section in Chapter 4 contains existing and proposed mitigation. Also, Chapter 4.23 contains a complete and thorough description of existing and proposed mitigation measures.

Land Use - Chapter 4.1

- Land management will continue under the ITAM program, and the Integrated Natural Resources Management Plans which are reviewed and updated every five years.

Climate/Air Quality - Chapter 4.2
- Vehicle and power plant modifications exist to reduce carbon monoxide and unburned fuel emissions.
- Control of unnecessary vehicle idling.
- The Army participates in Fairbanks North Star Borough vehicle emissions testing program.

Soils and Permafrost - Chapter 4.6 and 4.7
- USARAK Regulation 350-2 Range Regulation requires the Army to fill in excavations and adhere to stream crossing and seasonal travel guidelines.
- Use of damage control steps in individual training plans.
- Integrated Training Area Management (ITAM) program inventories and monitors, repairs, maintains, and enhances training lands.
- Soil surveys are being completed for the withdrawal lands.

Surface Water - Chapter 4.8
- USARAK Regulation 350-2 Range Regulation requires the Army to control erosion and maintain streambank integrity, thereby reducing the risk of degraded water quality.
- The Army complies with all applicable State and Federal water resources statutes, and the Alaska State Drinking Water Standards for public water systems.

Groundwater - Chapter 4.9
- USARAK Regulation 200-4 Hazardous Waste, Used Oil and Hazardous Materials Management outlines guidelines for proper management of hazardous wastes.
- Spill Prevention Control and Countermeasure Plans implement measures to prevent oil spills from reaching navigable waters and/or groundwater.

Wetlands - Chapter 4.10
- A wetland planning-level survey was recently completed at Fort Wainwright Yukon Training Area and a similar study is in progress at Fort Greely.
- A wetlands management and revegetation plan is funded and in progress for the withdrawal lands.

Vegetation - Chapter 4.11
- Military Regulations provide procedures for protecting vegetation.
- Vegetation surveys are being conducted to identify ecosites and manage lands to protect ecosystems.
- Forest Management Plans are being prepared.

- Land Rehabilitation and Maintenance projects are being conducted to restore vegetation.

Wildlife - Chapter 4.12
- Habitat Management Plans are being completed as part of the Integrated Natural Resource Management Plans.
- Sensitive habitat protection and minimum disturbance periods for several wildlife species.
- Prescribed burns to improve ruffed grouse habitat.
- Surveys to identify raptor habitats and locate nest sites.
- Surveys for neotropical birds and waterfowl to identify species.
- Surveys for small mammals to identify populations.
- Bird Air Strike Hazard Program has been implemented.

Fisheries - Chapter 4.13
- No existing mitigation for directly managing fisheries.
- Current erosion control practices, water quality standards, and vegetation disturbance restrictions indirectly affect fish through protection of habitat.
- Ice bridge permits contain restrictions to protect fish populations.

Threatened or Endangered Species (State and Federal) - Chapter 4.14
- Surveys for threatened or endangered species are incorporated into other surveys.

Fire Management - Chapter 4.15
- Fire Management Plans to assess current fire hazards and list recommendations to reduce them. This includes maintaining current firebreaks.
- Monitoring of fire danger parameters, restrictions on military activities when necessary.
- Prescribed Burn Plans for fire hazard reduction and wildlife habitat improvement.

Public Access - Chapter 4.16
- Military regulations restricting public access imposed to provide public safety, protect vegetative communities, and wildlife and sensitive habitats while providing quality access.
- The Special Use Airspace Information Service (SUAIS), is provided to civilian pilots. The 24-hour service (1-800-758-8723 or 907-372-6913) provides information on which Military Operations Areas are active, Army artillery firing, and known helicopter operations.

Recreation - Chapter 4.17
- Federal, State, and military regulations govern recreational use of military lands.
- Recreational activities are monitored through the Integrated Natural Resources Management Plans.

Cultural Resources - Chapter 4.18
- The USARAK cultural resources management program provides for the inventory, evaluation, and protection of archeological sites.

Subsistence - Chapter 4.20
- Access to the withdrawn lands is permitted by the Army for subsistence purposes when it does not impact military training nor is a hazard to public safety.

Noise - Chapter 4.22
- Limit hours of firing demolitions, field artillery, and mortars from 6 a.m. to 10 p.m.; public notified of exceptions.
- Aircraft must fly at least 1,500 feet above ground level (AGL) over the Chena River Recreation Area from May 1 through September 30.
- U.S. Air Force mitigation relevant to the withdrawal lands decrease noise-derived adverse impacts.
- U.S. Air Force provides a 24-hour public comment line (1-800-538-6647) to collect comments or complaints regarding noise.

2.1.3.7 Proposed Mitigation

The following programs are proposed to be implemented by the Army at Fort Wainwright and Fort Greely with the renewal of the withdrawal lands for military use. These programs will provide additional mitigation for achieving the military's mission while offering more extensive environmental protection for the duration of the withdrawal renewal. Chapter 4.23 contains a complete and thorough description of existing and proposed mitigation measures.

Pollution - Chapter 4.23
- Implementation of a program to identify possible munitions contamination of withdrawal lands. Includes collection of baseline data to determine the location, extent, and potential migration of munitions contamination in soils, surface water, and groundwater, and development of a long-term monitoring program to assess cumulative impacts

Decontamination - Chapter 4.23
- Creation of a data collection system to incorporate munitions expenditure reports, number of duds in an area, chemical components of munitions, and biohazards of each chemical.

Soils - Chapter 4.6
- Implementation of a program to identify possible munitions contamination to soils of the withdrawal lands.

Permafrost - Chapter 4.7
- Implementation of a program to identify possible munitions contamination to permafrost of the withdrawal lands.

Surface Water - Chapter 4.8
- Development of a water quality sampling program, with monitoring stations located directly upstream and downstream of the installations.

Groundwater - Chapter 4.9
- Organize existing groundwater data to complete a more detailed groundwater quality assessment. Base future monitoring efforts on this compiled data.
- Monitoring program will also include munitions components.

Wetlands - Chapter 4.10
- Additional mitigation will be determined by the U.S. Army Corps of Engineers through the permitting process for the Clean Water Act, Section 404.

Vegetation - Chapter 4.11
- Implement forest resources inventory, complete and implement Forest Ecosystem Management Plans which are part of the Integrated Natural Resources Management Plans.

Wildlife - Chapter 4.12
- Information from bird surveys will be reviewed to identify habitat areas for neotropical migrants. Breeding Bird Surveys will continue on Fort Wainwright and be implemented on Fort Greely.

Fisheries - Chapter 4.13
- Fishing opportunities for the public will be maintained. Habitat for stocked fish will be improved.
- Wild fisheries habitat surveys will be conducted.

Threatened or Endangered Species (State and Federal) - Chapter 4.14
- If threatened or endangered species are found, management guidelines will be written and implemented after consultation with the U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.

Fire Management - Chapter 4.15
- Interservice Support Agreements will be maintained for the length of the withdrawal.

Public Access - Chapter 4.16
- U.S. Army Alaska will develop a public information packet and media strategy to inform the public of restricted access areas and areas open for public use.

Recreation - Chapter 4.17
- Recreational use of stocked lakes will be monitored to determine impacts to the vegetation and shoreline surrounding the lakes.

Noise - Chapter 4.22
- Determine noise impacts to key species, such as caribou and bison, and include protection requirements within a management plan.

2.2 COMPARISON OF ALTERNATIVES

Implementing either of the alternatives results in different actions occurring on the withdrawal lands. The alternative chosen for implementation determines which agency has jurisdiction over the withdrawal lands. Specific agency ownership of the land determines the management actions implemented. Table 2.k provides a comparison of resource management under each alternative.

Resource management under the Proposed Action was obtained from the Army's Integrated Training Area Management Program for Fort Wainwright and Fort Greely, and Federal laws governing military land management, which is consistent with the existing Resource Management Plans for Fort Wainwright and Fort Greely.

The existing Resource Management Plans would guide the Bureau of Land Management's management of the withdrawal lands under the No Action Alternative. Therefore, management actions would be similar. However, the State of Alaska has future selections on the land that would become valid. It is impossible to predict how much of the land would be conveyed to the State.

However, for purposes of comparison it is assumed the State would acquire title to all of the training lands.

Resource management under the No Action alternative was obtained from the *Draft Evaluation Units for Final State Land Selections* (ADNR 1992) and the *Tanana Basin Area Plan for State Lands* (ADNR 1991). Since the State has not obtained ownership of the withdrawal lands, specific management guidelines have not been developed for these land parcels. If the State does obtain ownership, the withdrawal lands will be managed according to the *Tanana Basin Area Plan for State Lands* (ADNR 1991).

Combining the State's Resource Information Summaries for the withdrawal lands and reviewing the State's management guidelines for its surrounding land parcels, it was possible to derive resource management actions which would be implemented by the State under the No Action alternative.

Table 2.k Comparison of Each Alternative Based on Which Entity Would Own the Property and the Management Actions Each Would Impose on the Properties.

MANAGEMENT	NO ACTION	PROPOSED ACTION (CONTINUE CURRENT MANAGEMENT PRACTICES)
Land Ownership	State	Federal
Agriculture	Increase & Preserve Agricultural Lands	BLM Outgrants with Army Concurrence; None Issued
Grazing	Increase & Preserve Grazing Lands	BLM Grants Leases with Army Concurrence; None Issued
Cultural Resources	Preserve, Protect, & Interpret Historic, Prehistoric & Archaeological Resources	Inventory, Evaluate, & Protect Cultural Resources
Wildlife	Protect Habitat Values for Public Use & Economic Benefits	Game Management to Support Hunting & Fishing; Protect Nongame Species Habitat to Maintain Ecosystem
Vegetation	No Management Defined	Identify & Inventory Flora; Protect Rare, Threatened, or Endangered Species; Manage with Ecosystem Management Strategies

Table 2.k Comparison of Each Alternative Based on Which Entity Would Own the Property and the Management Actions Each Would Impose on the Properties.

MANAGEMENT	NO ACTION	PROPOSED ACTION (CONTINUE CURRENT MANAGEMENT PRACTICES)
Forestry	Ensure Continuous Productivity & Availability under Multiple Use Principles for Economic Development & Personal Use	BLM Administers Commercial Harvest of Timber Products with Army Concurrence
Lake Shore & Stream Corridor Management	Protect for Recreational Opportunities & Water Quality; Provide Land for Private Ownership	Protect to Maintain Ecosystem Functions & Provide Recreational Opportunities
Saleable Minerals	Suitable Sites Maintained in State Ownership & Made Available to the Public	Mineral Material Disposal to Support Military Activities
Public Access	Provide Access to Public & Private Lands	Open to Public Except Where Posted
Recreation	Provide & Manage Recreational Opportunities for Alaskans & Support a Tourism Industry	Provide Recreational Opportunities Compatible with Military Needs
Settlement	Private Land Sales with Emphasis on Meeting Demand for Recreational & Seasonal Residences	Lands Not Available for Disposal
Leasable and Locatable Minerals	Allow Development to Benefit State's Economy & Provide Aid for Infrastructure & Technical Support	BLM & Army Determine which Lands are Suitable for Opening to Development without Interfering with Military Mission
Wetlands	Maintain Hydrologic, Habitat, and Recreational Functions of Public Wetlands	Delineate, Protect, and Manage Wetlands

2.3 ALTERNATIVES CONSIDERED AND ELIMINATED

The National Environmental Policy Act (NEPA) requires that all reasonable alternatives for Federal actions be analyzed. With the input received during the scoping process, the Army examined all possible actions to build an effective and reasonable range of alternatives.

The Army and Air Force considered alternatives as reasonable if they could be implemented without impairing their ability to complete their mission in Alaska. Since Army and Air Force needs require renewal of the existing withdrawals in their entirety, the range of alternatives to be examined in this LEIS was refined to include only those alternatives that included the entire lands now withdrawn.

The following alternatives were considered and eliminated from further study in this LEIS.

2.3.1 Renew Withdrawal for Varying Lengths of Renewal Periods

For the Army to analyze the proposed action under a range of alternatives consisting of various lengths of renewal periods would offer little effective impact analysis. The scope of actions would remain virtually the same in comparing renewals for 15, 25, 50, or 100 year increments. Management and use of these withdrawal lands by the military would remain the same under each time period.

2.3.2 Partial Land Withdrawal

The Army considered an alternative to renew only two of the three withdrawn areas: Fort Wainwright's Yukon Training Area, Fort Greely West Training Area, or Fort Greely East Training Area. This alternative would eliminate the withdrawal on any one of these areas.

Fort Wainwright Yukon Training Area is the closest year-round training area for troops stationed at Fort Wainwright. Considerable costs of time and travel would be incurred by the Army with the loss of the Yukon Training Area to access other military training lands in Alaska.

Fort Greely's West Training Area provides a large contiguous training area and associated Impact Areas to allow the firing of a large variety of conventional Army and Air Force weapons. Its location in interior Alaska has a winter climate that allows testing of military equipment at temperatures from -5°F down to temperatures below -50°F. Cold weather testing at these severe winter temperatures, and for the extended duration as occurs on Fort Greely, normally cannot be accomplished at any other Army installation in the United States.

Air drop of both personnel and equipment is essential to support forced entry missions essential to modern day warfare. The Donnelly Drop Zone in Fort Greely's East Training Area offers the ability to conduct mass tactical operations of up to battalion size and large heavy drop resupply missions including Container Delivery System (CDS) and Low Altitude Parachute Extraction System (LAPES). The Donnelly Drop Zone is one of the finest Drop Zones in the Army's inventory with desirable physical size, terrain, wind currents, and accessibility. The capabilities of this Drop Zone are not available anywhere else in Alaska. The loss of the Donnelly Drop Zone would seriously degrade the ability of the Alaskan Airborne Regiment to accomplish its primary mission; the essential task of airborne forced entry into a hot spot. This unit is currently the Commander-in-Chief Pacific's (CINCPAC) Crisis Response Force (CRF) with a critical world wide mission. This Drop Zone is also used extensively to conduct joint exercises with allied and sister service units.

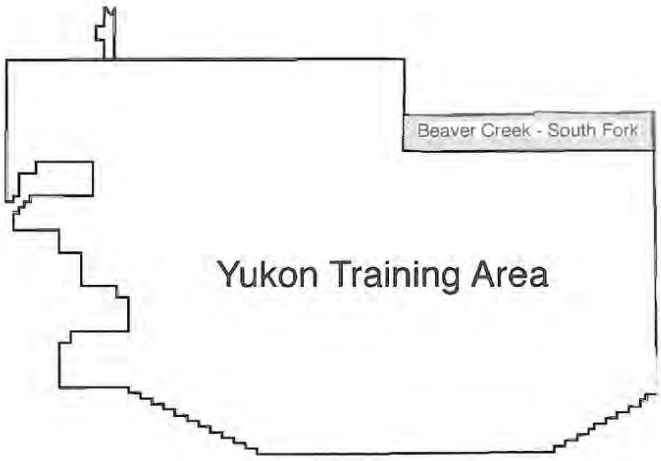
The only air-to-ground ranges available in Alaska are located at Stuart Creek, Oklahoma/Delta Creek, and at Blair Lakes on the Tanana Flats (see Figure 1.b). Blair Lakes is a non-tactical range. Only Stuart Creek and Oklahoma/Delta Creek Impact Areas meet the tactical training requirements of the 11th Air Force aircraft. A single range cannot handle multiple flights of fighter aircraft simultaneously. Therefore, both the Fort Wainwright Yukon Training Area and Fort Greely West Training Area are needed to fulfill aircraft training operations for the 11th Air Force.

Present Army and Air Force training and testing needs require the use of all existing military lands to fulfill their mission in Alaska. Therefore, the Army and Air Force eliminated this alternative from further study.

2.3.3 Relinquish Beaver Creek-South Fork Area in the Fort Wainwright Yukon Training Area to Alaska State Parks

The State of Alaska Division of Parks has requested the Army relinquish title to 13,440 acres in the Beaver Creek-South Fork area on the Fort Wainwright Yukon Training Area. This acreage was designated as part of the Chena River State Recreation Area by the State legislature. However, this State action does not transfer title of the land nor was it supported by Federal agencies. Army and Air Force training equipment exists on this land and it serves as part of the Buffer Zone for the Stuart Creek Impact Area (see Figures 2.f and 2.g).

Figure 2.g Beaver Creek-South Fork area of the Yukon Training Area, Fort Wainwright.



The Air Force has demonstrated a critical need for the use of the Beaver Creek-South Fork area as the preferred entry route for maneuvering and attacking tactical targets on the Stuart Creek Impact Area. Relinquishing this portion of the Fort Wainwright Yukon Training Area would restrict aircraft ingress and egress routes over the Stuart Creek Impact Area and reduce the land available for realistic training scenarios. Loss of the Beaver Creek Valley to this area would severely impact the Air Force's use of existing northern target formations by limiting their final attack headings and would prohibit the use of one of the most tactically desirable routes (Department of Air Force letter dated May 28, 1998).

Relinquishing the Beaver Creek Valley would prohibit certain types of weapon delivery training by the Air Force. Low altitude loft or high altitude dive bomb deliveries with training ordnance, 20mm/30mm gattling gun strafe, or inert 2.75 inch rocket deliveries would be lost. Aircraft routinely fly through the valley, armed and ready to expend ordnance on the targets in the Stuart Creek Impact Area. Loss of the Beaver Creek Valley would reduce arming distances and possibly prevent overflight of the area by aircrews during ingress (see Figure 2.f).

Automated anti-aircraft threat simulators protect the targets and require the aircrews to perform evasive maneuvers and expend chaff and flares to survive

a simulated attack. Relinquishing the Beaver Creek Valley could lead to conflict with civilian users and degrade the Air Force's ability to conduct threat avoidance maneuvers and expend counter measures to defeat the simulated threat systems that defend the targets (see Figure 2.f).

When firing occurs into the Stuart Creek Impact Area, the affected portion of the Impact Area and a two mile buffer adjacent to it are off-limits to military access and use. By relinquishing the Beaver Creek-South Fork area, the Army would lose part of its Buffer Zone and would be forced to convert existing active training land to new buffer area. Thus, reductions in target options and loss of ranges available for training would occur.

Loss of the Beaver Creek-South Fork area would severely hamper the use of northern target formations, which would reduce the effectiveness of military training by affecting the military's ability to conduct realistic combat training. This ultimately degrades the combat capability of military units in Alaska. Due to the excessive impacts to military training and the importance of this area's training infrastructure in achieving combat readiness, the Army and Air Force eliminated this alternative from further study.

2.3.4 Bureau of Land Management Retain Authorization for Mineral Extraction

This alternative would allow the Bureau of Land Management the right to grant use of the withdrawal lands for mineral extraction without Army concurrence. It is possible that conflicts between military and mineral use might occur. Military use of the withdrawal lands would be compromised if the Army could not control the use of its training lands. The Army eliminated this alternative from further study.

2.3.5 Acquiring Alternate Training Lands

The Army considered an alternative to acquire alternate sites in Alaska to relocate its training and testing activities. Military training and testing has occurred on these withdrawal lands for nearly 50 years with portions dedicated as High Hazard Impact Areas. It is unlikely the technology exists to completely decontaminate an Impact Area at an economically feasible cost. It therefore seemed unreasonable and impractical to propose to relocate military training and testing activities to other public lands and commit resources at these alternate sites as new High Hazard Impact Areas. In addition, acquiring other public lands in Alaska for use by the military would be cost prohibitive even if the necessary acreage was available.

2.3.6 Acquiring Additional Training Lands

U.S. Army Alaska determined acquiring additional land will not be considered in this withdrawal renewal action. Larger training lands would allow the Air Force to fully utilize all weapon systems while training and increase the Army's ability to conduct joint training by utilizing linked training areas. However, additional land acquisition falls outside the scope of this withdrawal renewal action.

2.4 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The Army's preferred alternative is to renew the withdrawal of the Fort Wainwright Yukon Training Area, and Fort Greely West and East Training Areas for 50 years until November 6, 2051.

2.5 MATRIX OF ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

Table 2.I contains a matrix of the alternatives comparing their environmental consequences.

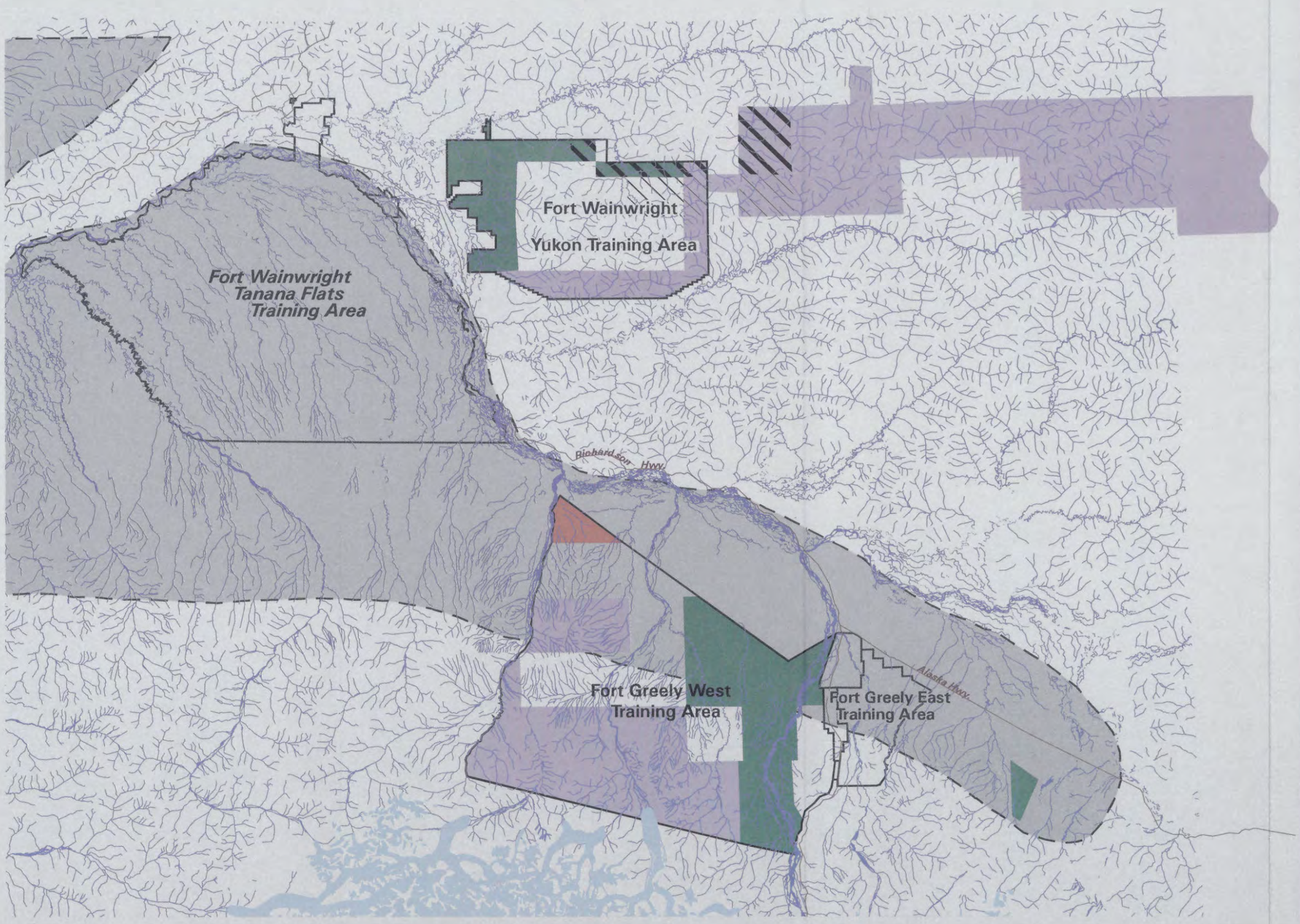


Figure 2.a

State Resource Selections

Fort Wainwright and Fort Greely

Legend

- *Post Boundary*
- *Minerals, Moderate Value*
- *Forestry, High Value*
- *Habitat, High Value*
- *Recreation, High/Moderate Value*
- *Recreation, High Value*
- *Oil/Gas Basin*
- *Road*
- *Stream*
- *Glacier*

SCALE 1 : 750,000

5 0 5 10 15 20 25 30 35 Kilometers

5 0 5 10 15 20 Miles

N

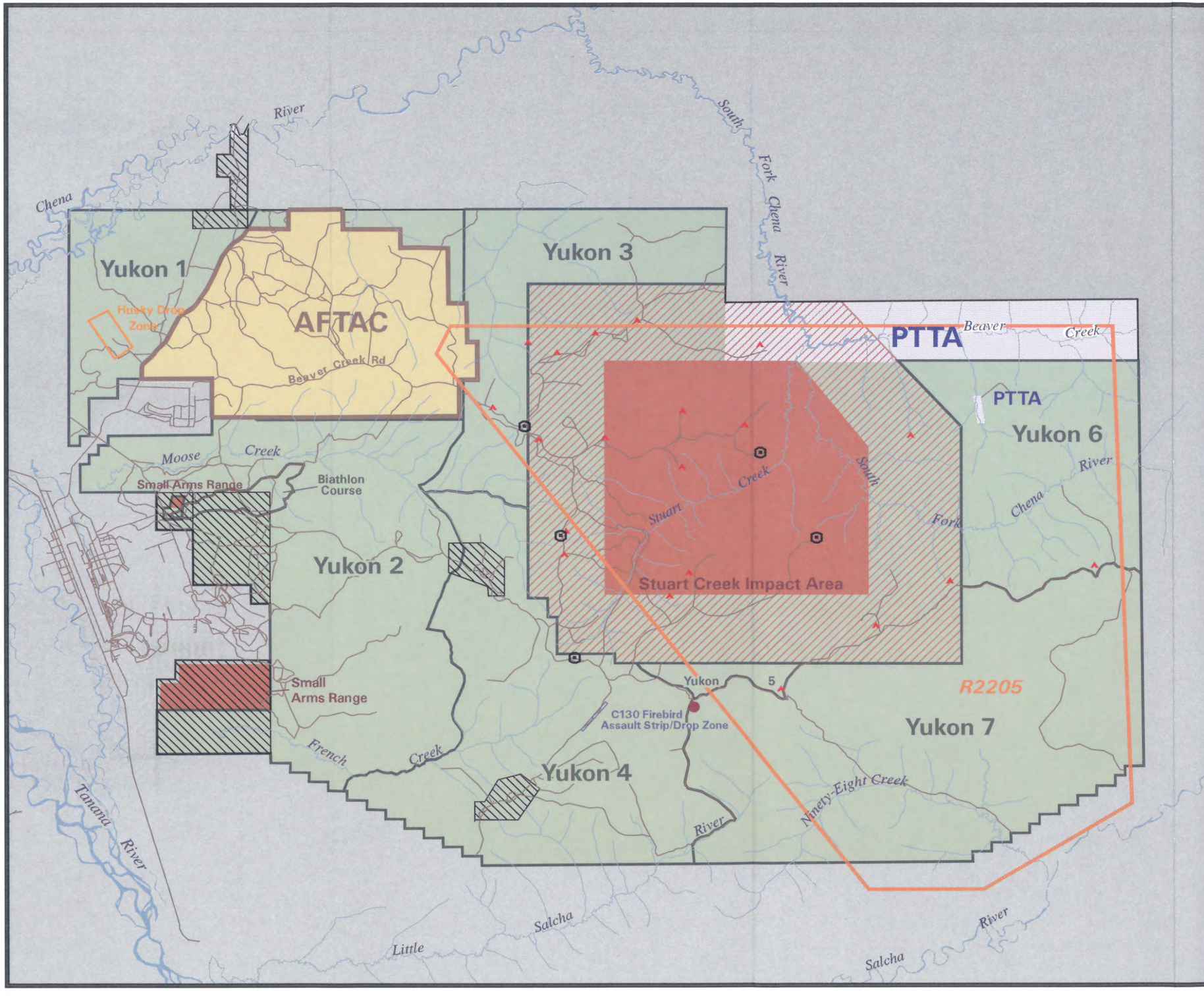
Sources:

Alaska Department of Natural Resources
Division of Land; Evaluation Statistics
for Final State Land Selections

Figure 2.b

Army Facilities

Fort Wainwright Yukon Training Area



Legend

- High Hazard Impact Area
- Impact Area Buffer Zone
- Training Area
- Prohibited Tactical Training Areas (PTTA)
- Air Force Technical Applications Center (AFTAC)
- Drop Zone
- Firing Point
- Restricted Airspace, R2205
- Observation Point
- Military Assault Course
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Road
- Stream

SCALE 1 : 165,000

1 0 1 2 3 4 5 6 7 Kilometers

1 0 1 2 3 4 Miles

N

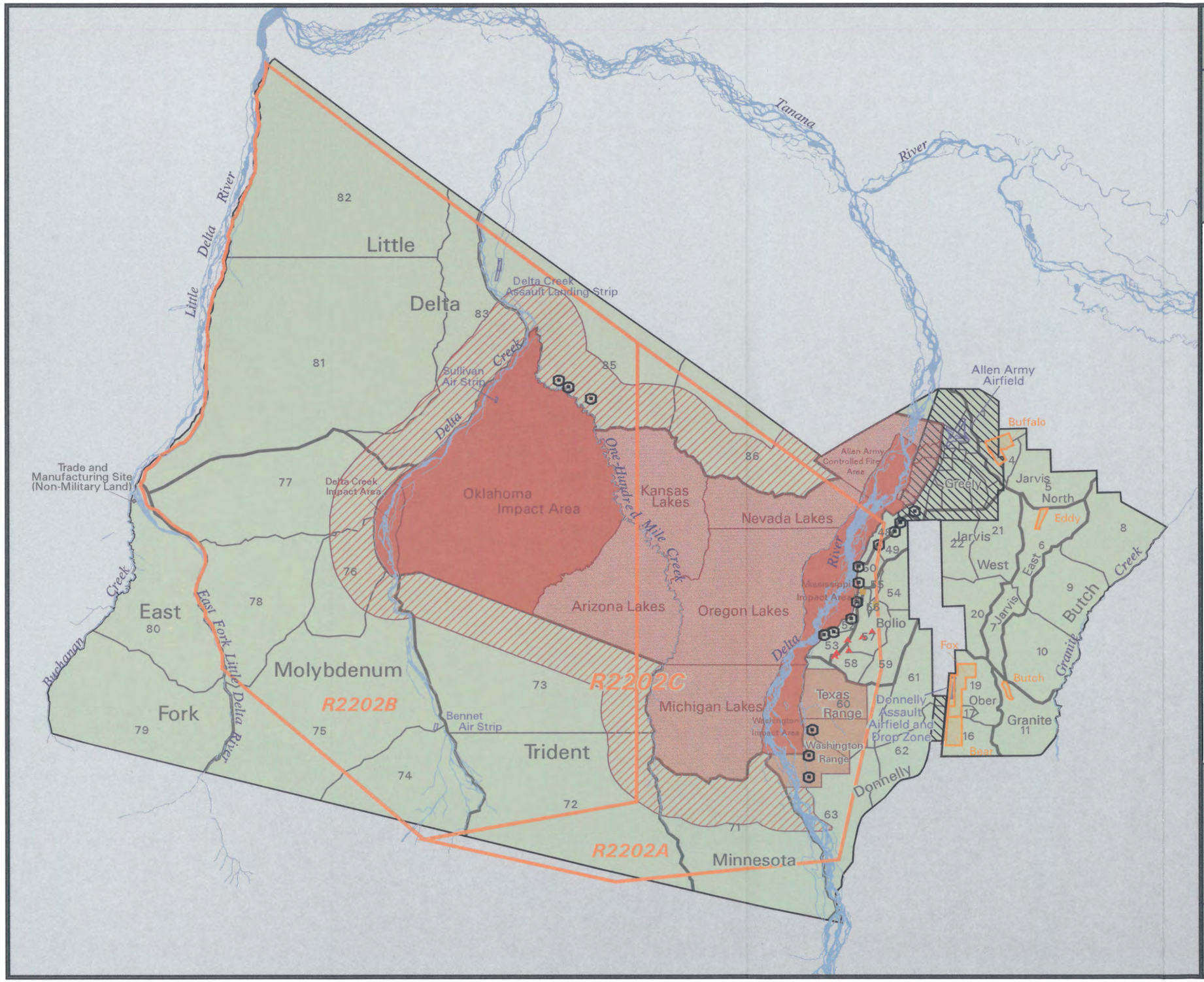
Sources:

U.S. Army, Alaska
USGS, 1998

Figure 2.c

Army Facilities

Fort Greely



Legend

- *Impact Area Boundary*
- *Dedicated Impact Area*
- *High Hazard Impact Area*
- *Impact Area Buffer Zone*
- *Training Area*
- *Sub-Training Area Boundary*
- *Airfield*
- *Drop Zone*
- *Restricted Airspace, R2202*
- *CRTC Test Site*
- *Firing Point*
- *Observation Point*
- *PL99-606 Withdrawal Boundary*
- *Other Military Withdrawal Boundaries*
- *Stream*

SCALE 1 : 280,000

1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 Kilometers

1 0 1 2 3 4 5 6 7 8 Miles

N

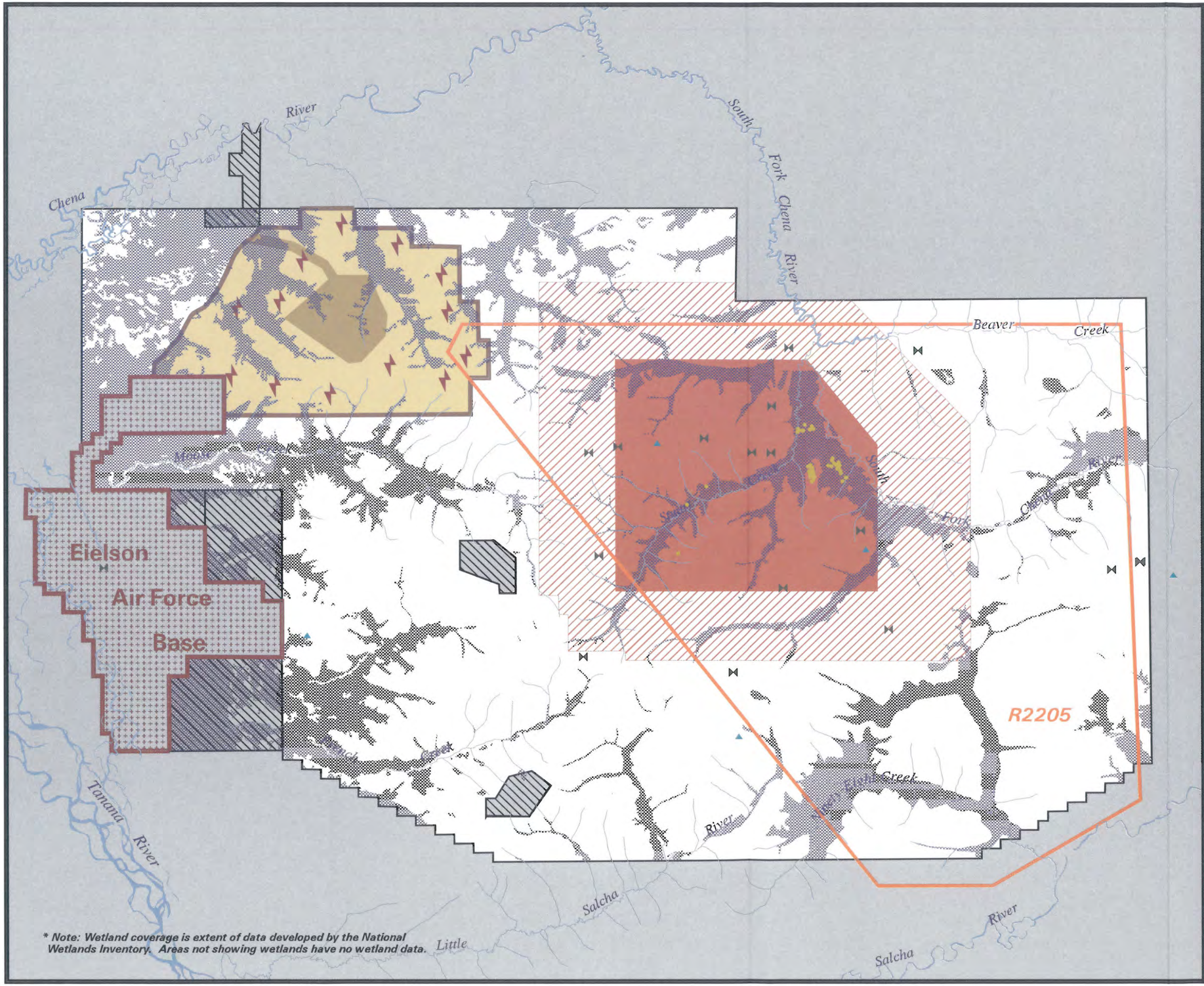
Sources:

U.S. Army Alaska
USGS, 1998

Figure 2.d

Air Force Facilities

Fort Wainwright Yukon Training Area



* Note: Wetland coverage is extent of data developed by the National Wetlands Inventory. Areas not showing wetlands have no wetland data.

Legend

- Target Array
- Threat Emitter Site
- Yukon Measurement and Debriefing System
- Air Force Technical Applications Center (AFTAC)
- Air Force Exclusive Use
- Air Force and Army Joint Use
- Monitoring Equipment
- Restricted Airspace, R2205
- Stuart Creek Impact Area
- Impact Area Buffer Zone
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream
- Wetland

SCALE 1 : 165,000

1 0 1 2 3 4 5 6 7 Kilometers

1 0 1 2 3 4 Miles

N

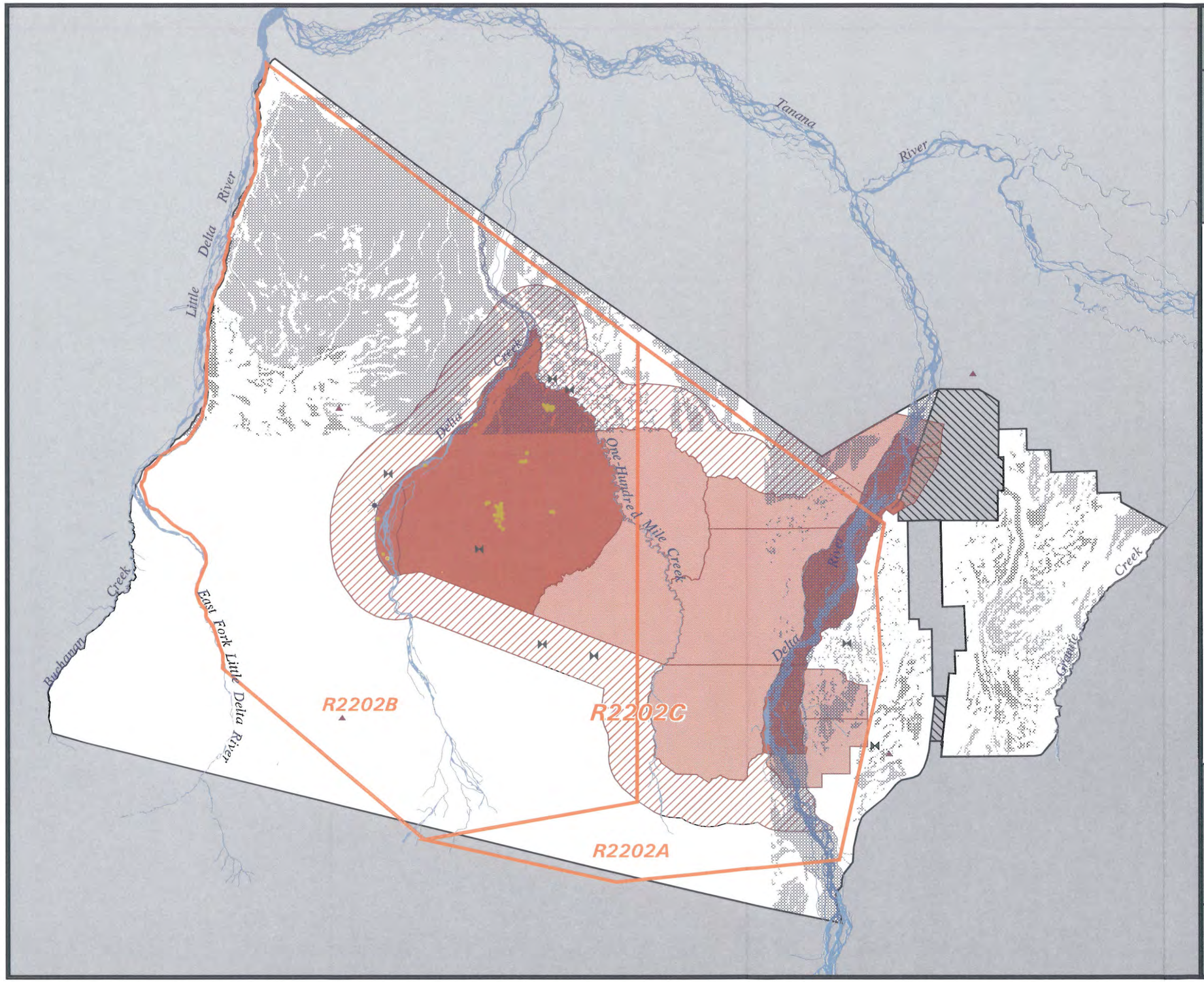
Sources:

U.S. Army, Alaska
U.S. Air Force, 11th Air Force

Figure 2.e

Air Force Facilities

Fort Greely



Legend

- Target Array
- Threat Emitter Site
- Yukon Measurement and Debriefing System
- CALFEX Range
- Restricted Airspace, R2202
- Dedicated Impact Area
- High Hazard Impact Area
- Impact Area Buffer Zone
- PL99-606 Withdrawal Boundary
- Other Military Withdrawal Boundaries
- Stream

SCALE 1 : 280,000

1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 Kilometers

1 0 1 2 3 4 5 6 7 8 Miles

N

Sources:

U.S. Army, Alaska
U.S. Air Force, 11th Air Force

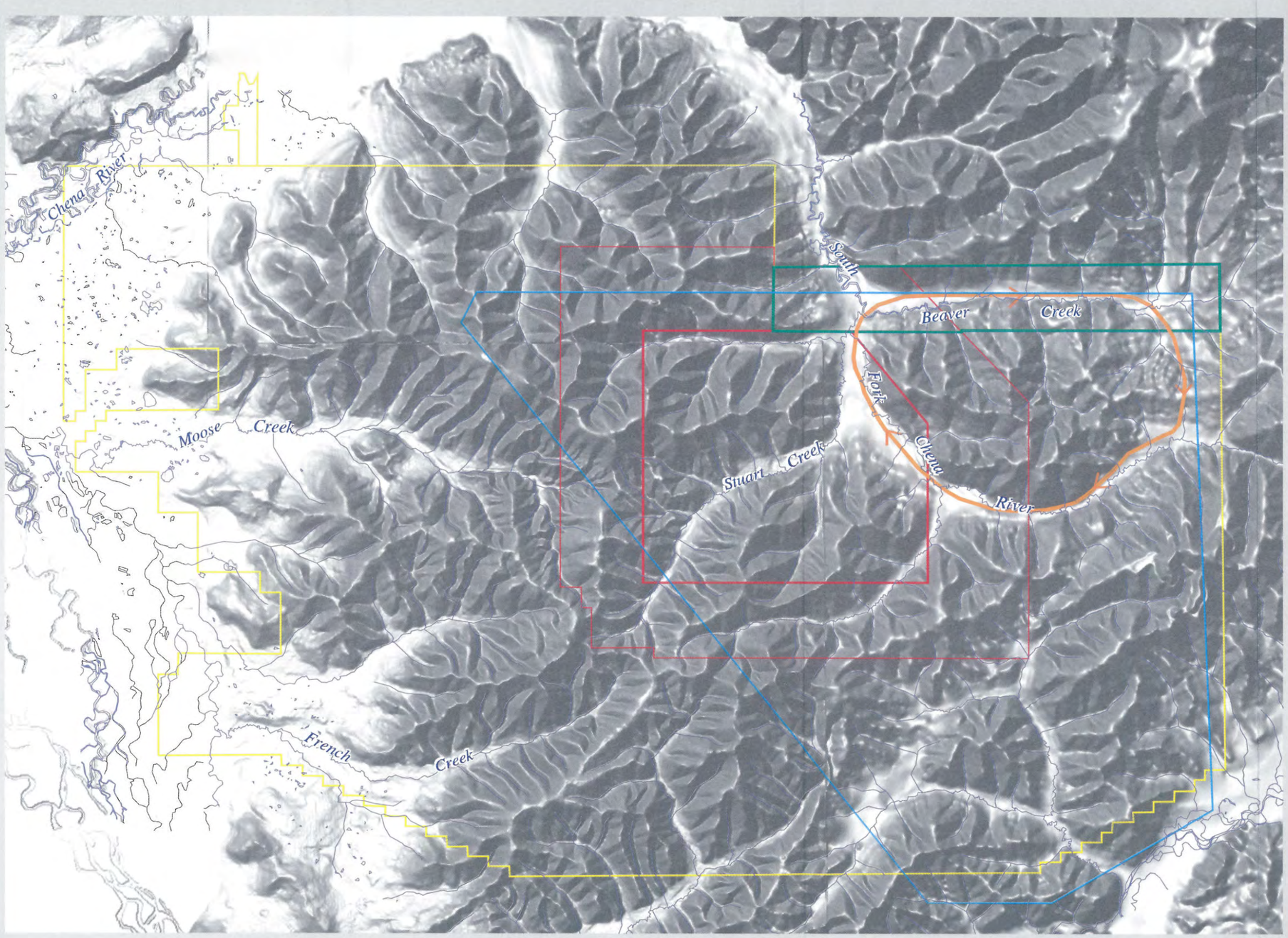


Figure 2.f

Air Force Use Beaver Creek-South Fork

Legend

- Yukon Training Area
- Stuart Creek Impact Area Boundary
- Stuart Creek Buffer Zone Boundary
- Stream
- Prohibited Tactical Training Areas (PTTA)
- Ingress/Egress Route
- Restricted Airspace, R2205

* Vertical Exaggeration = 5x

SCALE 1 : 165,000

1 0 1 2 3 4 5 6 7 Kilometers

1 0 1 2 3 4 Miles

N

Sources:

Wahrhaftig, 1965
USGS, 1998

PARAMETERS	PREFERRED ALTERNATIVE	NO ACTION ALTERNATIVE
Air Quality	Continue to generally meet standards. Carbon monoxide and particulates will continue to be most commonly produced pollutants.	Less pollution created by military. Unknown levels of of pollution from public use.
Ice Fog	Same as present.	Increase in production may result from increased public use.
Soils	As present. Some soil damage from vehicles, weapons, and fires. Some erosion with net soil loss and water impacts.	Less damage. Increased public use may impact resource. Impacts dependent upon State management.
Mineral Resources	No impact on mineral resources by military.	Mineral extraction activity could impact soils, surface water, groundwater, and wildlife.
Permafrost	As present. Localized long-term damage. Regulated as much as possible. Fires are a problem.	No military impacts. Impacts dependent upon State management.
Vegetation	No change. Negligible impacts from direct destruction by military activities. Indirect impacts from soil compaction, increased fires. Water quality changes.	No military impacts. Impacts dependent upon State management.
Surface and Groundwater Resources	Meets standards except for high background iron levels in surface waters. Spills/contamination risks.	Spill/contamination risks reduced. Impacts dependent upon State management.
Wildlife	Negative impacts - noise, activity, habitat destruction. No increase.	No military impacts. Impacts dependent upon State management.
Fisheries	No increase in negative impacts. Negative habitat impacts. Military aids in lake stocking.	No military impacts. Impacts dependent upon State management. Stocking continues.
Threatened, Endangered, and Species of Concern	"Not likely to adversely impact" as stated by USFWS.	No military impacts. Impacts dependent upon State management.
Recreation/Tourism	Current conditions continued; access restricted.	Access improved; impacts from public use may occur. Increase in tourism revenue.
Air/Land Access	Military controlled.	Reduced military control. Possible improved access.
Fires	Military caused: 88%; Lightening strikes: 12%	No military impacts. Impacts dependent upon State management.
Contamination/Hazardous Materials	Continues from weapons testing, vehicle maneuvering. Risk of hazardous spills. Continuous cleanup operations.	Requires complete cleanup, dependent upon funding and technology.
Noise	No increase. Negative impacts continue.	No military impacts. Impacts dependent upon State management.
Military Socioeconomics	Continued military training, research, and development. Defense preparation.	Compromise military activity. Need substitute training lands.
Area Socioeconomics	Continued rates of employment, income, and population/schools.	Decreased military based activity. Increase due to tourism and land use changes.
Cultural Resources	Continued Federal protection.	State protection.
Subsistence	Continued use.	Access improved.
Land Use	Military controls. Works with BLM where possible. No mineral extraction. Some recreation, agriculture, forestry.	State disperses if decontaminated. Used for tourism, recreation, settlement, mineral extraction, and wildlife. Impacts dependent upon State management.