U.S. Army Garrison Fort Wainwright

Integrated Natural Resources Management Plan

Draft Update
22 March 2013

Sikes Act Road Map

The Sikes Act Road Map references the chapters and paragraphs in the Integrated Natural Resources Management Plan (INRMP) and is cross-referenced to the thirteen criteria points required by the Sikes Act. Stakeholders and interested parties can use the road map to quickly check the location and effectiveness of this INRMP in meeting Sikes Act requirements.

Required Sikes Act Criteria	Location in Integrated Natural Resources Management Plan
1. No net loss in the capability of military installation lands to support the military mission of the installation;	Chapter 1, Chapter 2 and throughout the Integrated Natural Resources Management Plan.
2. Establishment of specific natural resource management goals and objectives and time frames for proposed action;	Chapter 4 and Appendix B, C, D, E, and F
3. Integration of, and consistency among, the various activities conducted under the plan;	Chapter 4
4. Fish and wildlife management, land management, forest management, and fish and wildlife oriented recreation;	Chapter 3 and Appendix B, C, and D.
5. Fish and wildlife habitat enhancement or modification;	Chapter 3 and Appendix D.
6. Provisions for spending hunting and fishing permit fees exclusively for the protection, conservation, and management of fish and wildlife, including habitat improvement, and related activities in accordance with Integrated Natural Resources Management Plan.	Chapter 4 and Appendix A and D.
7. Wetland protection, enhancement, and restoration, where necessary for support of fish and wildlife;	Chapter 3 and Appendix B.
8. Public access to the military installation that is necessary or appropriate for sustainable use of natural resources by the public to the extent that such use is consistent with the military mission and the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security.	Chapter 3 and Appendix E.
9. Sustainable use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management;	Chapter 3 and Appendix E.
10. Enforcement of applicable natural resource laws and regulations;	Chapter 3 and Appendix E.
11. Exemption from procurement of services under Office of Management and Budget Circular A-76 and any of its successor circulars.	Chapter 4 and Appendix A.
12. Priority for contracts involving implementation of this Integrated Natural Resources Management Plan to state and federal agencies having responsibility for conservation of fish and wildlife.	Chapter 4 and Appendix A.
13. Review of this Integrated Natural Resources Management Plan and its effects every five years.	Chapter 1, Chapter 4 and Appendix A.

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EXECUTIVE SUMMARY

The Fort Wainwright Integrated Natural Resources Management Plan (INRMP) establishes policies, programs, prescriptions, projects, and procedures that U.S. Army Garrison Fort Wainwright (USAG FWA) uses to manage natural resources on Army training lands in Alaska. The INRMP contains goals and specific objectives necessary to (1) sustain "no net loss" in the capability of military lands to support mission requirements, (2) support stewardship of natural resources, (3) ensure compliance with applicable environmental laws, and (4) maximize public access within the constraints of the military mission while protecting public safety and conserving the environment. The Fort Wainwright INRMP reflects mutual agreement of USAG FWA, U.S. Fish and Wildlife Service (USFWS) and Alaska Department of Fish and Game (ADFG) concerning the conservation of the natural resources under their respective legal authorities. The INRMP consolidates other related Army natural resource planning documents in one place, including the Ecosystem Management Plan, Integrated Wildland Fire Management Plan, Endangered Species Management Plan, Forestry Management Plan, Watershed Management Plan, and Outdoor Recreation Management Plan. The INRMP also incorporates the applicable Bureau of Land Management (BLM) Resource Management Plans for Yukon and Donnelly Training Areas.

INRMP STATUS

The initial Fort Wainwright was signed and implemented in 1998. The Fort Wainwright INRMP was revised in 2002 and again in 2007 due to substantial changes in natural resources management proposals, as well as agency, tribal, and public stakeholder comment. The National Environmental Policy Act (NEPA) process was used to meet the Department of Defense's INRMP public review requirements for the initial Fort Wainwright INRMP in 1998. Due to substantive changes in the 2002 and 2007 Fort Wainwright INRMP revisions, public review was again accomplished through the NEPA process. Based on (1) no changes recommended during the annual 2012 review with USFWS and ADFG; (2) no change in the Fort Wainwright mission; (3) no changes to Fort Wainwright natural resource policy, programs, prescriptions, or procedures; (4) no change to the type of projects proposed in the previous plan; and (5) minor changes to the INRMP document itself, Fort Wainwright has concluded that an INRMP revision is not necessary and therefore Fort Wainwright proposes to implement an INRMP update in 2013.

2013 INRMP UPDATE

USAG FWA is updating the INRMP in 2013 as required by the Sikes Act. Tribal and agency comment on the 2013 Fort Wainwright INRMP update will be requested through the consultation process. Public comment is also welcome. Comments received prior to 15 April 2013 will be considered during the 2013 update. Comments received after 15 April 2013 will be considered during subsequent annual reviews. Minor changes from the previous version of the INRMP are proposed.

PROPOSED CHANGES TO THE 2013 FWA INRMP

a. The 2013 Fort Wainwright INRMP no longer applies to Fort Richardson. All references to natural resources management at Fort Richardson have been removed from the 2013 Fort Wainwright INRMP. Due to Base Realignment and Closure 2005, Fort Richardson was realigned and is now part of Joint Base Elmendorf-Richardson. As the lead service, the Air Force assumed management of natural resources on Fort Richardson on 1 October 2010. Natural resources management of Fort Richardson lands are now included in the Joint Base Elmendorf-Richardson INRMP.

b. Per Army guidance, the format of the 2013 Fort Wainwright INRMP has changed. The prescriptions (which were in a separate appendix) were added to Chapter 4 of the main plan. This format change

did not result in any substantive changes to the programs, policies, prescriptions, or procedures implemented in the 2007 INRMP.

c. Per Army guidance, the specific dates attached to the INRMP will be de-emphasized. The INRMP must be reviewed annually and evaluated for operation and effect at least once every 5 years, but if the policies, programs, procedures, and practices do not change substantially, with agreement of the Sikes Act partners, the existing plan will remain in effect. Specific projects will be included in an appendix and will be updated annually as they are funded, implemented, and completed, but project updates will not require new signatures from the Army or its Sikes Act partners as long as those projects are the same project types analyzed in previous INRMPs and NEPA documentation.

d. The 2013 FWA INRMP incorporates changes made in the newly revised Fort Wainwright Regulation 190-13, *Conservation Program – Enforcement*.

e. The 2013 FWA INRMP incorporates all PL 106-65 BLM Resource Management Plan (applies to Yukon Training Area and Donnelly Training Area) actions.

f. The 2013 FWA INRMP adds a section on the Army Compatible Use Buffer (ACUB) program.

g. The 2013 FWA INRMP includes a new Wildlife Air Strike Hazard plan.

h. The 2013 FWA INRMP adds a new Unresolved Issues section which acknowledges ongoing activities or pending decisions outside the authority of the INRMP that may affect natural resources on Army lands.

    1) Tanana River Bridge. This INRMP update does not propose changes to public access or use of the Tanana Flats Training Area. However, the construction of a dual-use railroad / military bridge across the Tanana River into Tanana Flats Training Area is likely to result in new impacts to natural resources in Tanana Flats Training Area. The analysis of the impacts of increased recreational use and the decision to allow or deny public access across the bridge was made in the Railroad Expansion Environmental Impact Statement / Record of Decision.

    2) Beaver Creek Road. This INRMP update does not propose changes to public access on Beaver Creek Road through the Air Force Tactical Application Center. However, The Air Force is currently working to update their license for use of the Air Force Tactical Application Center that would permanently close Beaver Creek Road to recreational traffic.

ECOSYSTEM STATUS

Fort Wainwright is subdivided into six major training areas: Main Post, Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area, Gerstle River Training Area, and Black Rapids Training Area. Fort Wainwright has five vegetative types: moist tundra; treeless bogs; fens; open, low-growing spruce forests; and closed spruce-hardwood forests. The installation has a wide variety of flora and fauna, none of which are classified as threatened or endangered. There are approximately 509 vascular species, 38 documented mammal species, 16 documented fish species, 158 documented bird species, and one species of amphibian, the Wood Frog (*Rana sylvatica*). There are no reptile species. Although the natural resources program affects many species, moose (*Alces alces*), bison, ruffed grouse (*Bonasa umbellus*), and black bear (*Ursus americanus*) are the most intensively managed by ADFG.

The quality of both surface and groundwater is assumed to be good, with the exception of localized pollution associated with past activities, mostly within the Main Post area. Due to this contamination, Fort

Wainwright has been declared a "Superfund" site under the Comprehensive Environmental Response, Compensation, and Liability Act. There have been no indications of changes in the quality of surface water since Army occupation of the land. Trends in biological diversity are not documented, but there is no reason to suggest that Army activity on the land has adversely affected biological diversity. Effects of military use on soils are primarily evident in the Main Post area.

Fort Wainwright's capability to support its current military mission is stable. The capability of the land to produce forest products has steadily improved since large-scale timber removal has not occurred and the forest is maturing, especially in areas where fires have been minimized. The post can clearly continue to support its small fuel wood and Christmas tree program. The capability of the ecosystem to support hunting, fishing, and trapping continues to be good. Fishing opportunities have increased in some areas due to stocking. Agriculture is not a viable option on Fort Wainwright.

PARTNERSHIPS

This INRMP cannot be implemented by USAG FWA alone. In accordance with land withdrawal legislation and the ecosystem management philosophy, USAG FWA is forging partnerships with various agencies to manage its natural resources. Major partners in the implementation of this plan are the BLM, USFWS, and ADFG. Other partners in this effort include Alaska Department of Natural Resources, universities, other federal and state agencies, Native groups, contractors, and private citizens.

SIKES ACT ROAD MAP

The Sikes Act Road Map references the chapters and paragraphs in the INRMP which is cross-referenced to the thirteen criteria points required by the Sikes Act. Stakeholder and interested parties can use the road map to quickly check the location and effectiveness of this INRMP in meeting Sikes Act requirements. The required Sikes Act criteria can be found in Table ES-1.

Table ES-1. Sikes Act Road Map.

Required Sikes Act Criteria	Location in Integrated Natural Resources Management Plan
1. No net loss in the capability of military installation lands to support the military mission of the installation.	Chapter 1, Chapter 2, and throughout the INRMP
2. Establishment of specific natural resource management goals and objectives and time frames for proposed action.	Chapter 4 and Appendix B, C, D, E, and F
3. Integration of and consistency among the various activities conducted under the plan.	Chapter 4
4. Fish and wildlife management, land management, forest management, and fish and wildlife oriented recreation.	Chapter 3 and Appendix B, C, and D
5. Fish and wildlife habitat enhancement or modification.	Chapter 3 and Appendix D
6. Provisions for spending hunting and fishing permit fees exclusively for the protection, conservation, and management of fish and wildlife, including habitat improvement, and related activities in accordance with INRMP.	Chapter 4 and Appendix A and D
7. Wetland protection, enhancement, and restoration, where necessary for support of fish and wildlife.	Chapter 3 and Appendix B
8. Public access to the military installation that is necessary or appropriate for sustainable use of natural resources by the public	Chapter 3 and Appendix E

Required Sikes Act Criteria	Location in Integrated Natural Resources Management Plan
to the extent that such use is consistent with the military mission and the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security.	
9. Sustainable use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management.	Chapter 3 and Appendix E
10. Enforcement of applicable natural resource laws and regulations.	Chapter 3 and Appendix E
11. Exemption from procurement of services under Office of Management and Budget Circular A-76 and any of its successor circulars.	Chapter 4 and Appendix A
12. Priority for contracts involving implementation of this INRMP to state and federal agencies having responsibility for conservation of fish and wildlife.	Chapter 4 and Appendix A
13. Review of this INRMP and its effects every five years.	Chapter 1, Chapter 4, and Appendix A

BENEFITS AND COSTS

Military Mission Benefits: Implementation of this plan will improve the quality of Fort Wainwright training lands and will improve long-range planning at USAG FWA. The INRMP will improve mission sustainability by enhancing training areas, as well as providing for more intensive planning of missions.

Environmental Benefits: The plan provides the basis for the conservation and protection of natural resources. It will reduce vegetation loss and soil erosion due to military activities, reduce the potential for environmental pollution and provide for biodiversity conservation. Certain sensitive areas and species will be protected from unacceptable damage or degradation. Plan implementation will increase overall knowledge of Fort Wainwright ecosystems through surveys and monitoring.

Other Benefits: Soldier sustainable range awareness will be enhanced for military training at Fort Wainwright. Both community relations and Fort Wainwright's environmental image will be enhanced. Quality of life for the Fort Wainwright communities and its neighbors will be improved. Plan implementation will decrease long-term environmental costs and reduce potential liabilities from environmental noncompliance.

Costs: It will cost about $8,746,000 (adjusted for inflation increases) annually, starting in 2013, to implement this INRMP. Funding will be provided primarily either from environmental conservation funds or training funds designated for implementation of the Integrated Training Area Management program. Other dollars will be from special natural resources funds, forestry, and fish and wildlife permit fees. Plan implementation will require staffing at the same level as in recent years, with the exception of additional contract personnel to implement Integrated Training Area Management and other new programs.

SUMMARY

The actions within this INRMP comply with environmental laws, conserve and protect Fort Wainwright natural resources, improve its relationship with the public, and enhance the military mission. While this

plan will not resolve all existing and / or future environmental issues, it does provide the guiding philosophy, personnel, and means to work toward resolution of such issues.

CHAPTER 1. INTRODUCTION AND OVERVIEW

The United States Army must maintain the capability, through a total force effort, to put overwhelming land combat power on any future battlefield and defeat any potential enemies. A decisive victory depends on the ability to rapidly deploy, fight, self-sustain, and win quickly with minimum casualties.

The military's need for land is based in its trust responsibility to provide for the national defense of the people of the United States. The United States has adopted an international political and military strategy that requires the nation's military forces to be ready to deploy on short notice for engagement anywhere in the world. The American people rightly expect these forces to be highly trained and equipped with the highest-performance materiel and technology available. Ready, capable forces result from repetitive training. New or modified weaponry and other equipment must be field-tested before being placed with the using units. Because of the speed and maneuverability of modern armaments, today's and tomorrow's armed forces require large tracts of land for training and weapons testing. Changes in tactical doctrine and weapons technology, designed to dissuade any would be-aggressor, to win battles and minimize casualties to American and allied forces in the event of armed conflict, are increasing the need for such land despite reductions in the size of the U.S. military since the Cold War and the closure of some military installations.

In the 21st century, the Army faces unprecedented challenges to its ability to train. Increased environmental regulation of training lands and ranges coupled with increased economic development around Army installations contribute to a more challenging training climate. A sound land management program that provides economical and acceptable planning and execution is mandatory to protect that land as an essential training asset.

Implementing this Integrated Natural Resources Management Plan (INRMP) would continue to provide a sound land management program that conserves land as an essential training asset, excellent stewardship, compliance with environmental laws, and recreational opportunities that contribute to quality of life.

1.1 Integrated Natural Resources Management Plan Vision

We must strive to become systems thinkers if we are to benefit from the interrelationships of the triple bottom line of sustainability: mission, environment, and community.[1]

The Army's commitment to natural resources management is reflected in the U.S. Army Strategy for the Environment: Sustain the Mission – Secure the Future. The Strategy establishes a long-range vision that enables the Army to meet its mission today and into the future. It transitions the Army from a compliance-based environmental program to a mission-oriented approach based on sustainability. A sustainable Army simultaneously meets current as well as future mission requirements worldwide, safeguards human health, improves quality of life, and enhances the natural environment.

The Army's commitment to natural resources management is emphasized in Army Regulation 200-1 (Environmental Protection and Enhancement), which requires that INRMPs be developed and maintained for all Army installations. This INRMP is a tool to help natural resources personnel implement ecosystem management at United States Army Garrison Fort Wainwright (USAG FWA). The INRMP looks at how Fort Wainwright's natural resources program objectives fit within the framework of the military mission and integrates the environmental program as a whole, outdoor recreation, the National Environmental Policy Act (NEPA), cultural resources, surrounding communities, and neighboring lands. It is also a

[1] R.L. Brownlee, Acting Secretary of the Army and Peter J. Schoomaker, General, Unites States Army, Chief of Staff.

source of information for responsible or interested parties that are not directly managing Fort Wainwright's natural resources. The INRMP is a component of and fits within the framework of the Fort Wainwright Master Plan and the U.S. Army Alaska (USARAK) Range Complex Master Plan.

1.2 Strategic Goals and Objectives

The main goal of this INRMP is to support USARAK and Fort Wainwright's military and nonmilitary activities while maintaining a functional, healthy ecosystem. Over the next five years this document and the programs outlined here will be refined as the situation warrants. Ecosystem management is an evolving management scheme. As new information and ideas are gleaned from current research, Fort Wainwright's management will change to reflect the best information available.

The following general goals and objectives are Fort Wainwright's commitment to manage natural resources. All five goals not only support management of natural resources but also support the overall military mission. Statements listed below represent general Fort Wainwright objectives for attaining those goals. These statements will serve as a checklist for monitoring the plan's success. More specific objectives and tasks are proposed for each Fort Wainwright land area in Chapter 4.

Military Readiness

Goal: Provide quality natural resources, as they are critical training assets for accomplishing the military mission of USARAK.

Objectives:

- Ensure no net loss in the capability of Fort Wainwright's lands to support existing and projected military missions.
- Maintain quality training lands through damage minimization, mitigation, and restoration.

Stewardship

Goal: Manage natural resources at Fort Wainwright to ensure good stewardship of public lands that are entrusted to the Army's care.

Objectives:

- Use ecosystem management philosophies to protect, conserve, and restore native fauna and flora with an emphasis on biodiversity enhancement.
- Monitor and manage soils, water, vegetation, and wildlife on Fort Wainwright's lands with a consideration for all biological communities and human values associated with these resources.
- Provide economic and other human-valued products of renewable natural resources when such products can be produced in a sustainable fashion without significant negative impacts on the military training mission.
- Provide professional enforcement of natural resource laws.
- Involve the surrounding community in Fort Wainwright's natural resources program.
- Ensure the Fort Wainwright's natural resources program is coordinated with other agencies and conservation organizations with similar interests.

Quality of Life

Goal: Improve the quality of life for the Fort Wainwright communities and the general public through development of high quality natural resources-based recreational opportunities.

Objectives:

- Provide opportunities for consumptive uses of natural resources within the biological and recreational carrying capacities.
- Provide natural resources-based opportunities for other outdoor recreation such as hiking, snowmobiling, boating and birding.
- Provide conservation education opportunities to the military and civilian community.
- Establish and maintain an environmental setting conducive to a healthy and satisfying lifestyle for the military community.

Compliance

Goal: Comply with laws and regulations that pertain to management of Fort Wainwright's natural resources.

Objectives:

- Manage natural resources within the spirit and letter of environmental laws, particularly the Sikes Act, upon which this INRMP is predicated.
- Manage to protect, restore, maintain or enhance sensitive species, wetlands, and unique areas.
- Use the NEPA process to make informed decisions that include natural resources considerations, mitigation, and agency and public involvement.
- Ensure that Fort Wainwright's natural resources program is consistent with the protection of cultural and historic resources.
- Implement this INRMP within the framework of Army policies and regulations.

Integration

Goal: Comply with laws and regulations that pertain to management of Fort Wainwright's natural resources. Integrate elements of natural resources management into a single program that in turn is integrated into Fort Wainwright's environmental and military training programs.

Objectives:

- Ensure the integration of, and consistency among, the various activities identified within this INRMP.
- Ensure that natural resources management is consistent with principles of integrated pest management at Fort Wainwright posts.
- Ensure the integration of new military infrastructure development with the principles and guidelines of this plan.
- Coordinate the implementation of natural resources management with Fort Wainwright's environmental programs.
- Use the natural resources program to support and enhance other elements within Fort Wainwright's environmental programs.
- Provide the command with information needed to make decisions, which include natural resources-related values.

1.3 Military Mission

USARAK's mission is to deploy combat ready forces to support joint military operations worldwide and serve as the Joint Force Land Component Command to support Joint Task Force Alaska. Other missions

of USARAK are the defense of Alaska, and coordination of Army National Guard and Reserve activities in the state.

USARAK is presently comprised of three brigade combat teams (two at Fort Wainwright and one at Joint Base Elmendorf-Richardson), and other battalion and company-sized supporting units split between the two installations. USARAK is a subordinate command of U.S. Army, Pacific. The 1/25th Stryker Brigade Combat Team is located at Fort Wainwright, the 4/25th Infantry Brigade Combat Team (Airborne) is located at Joint Base Elmendorf-Richardson, and the 16th Combat Aviation Brigade is stationed at Fort Wainwright.

In 2004, as a part of the overall transformation of the armed forces, the U.S. Army split off installation management functions from USARAK and created USAG FWA. Fort Wainwright's mission is to provide equitable, effective, and efficient management of Army installations in Alaska to support mission readiness and execution, enable the well-being of Soldiers, civilians, and family members, improve infrastructure and preserve the environment. Fort Wainwright supports infrastructure and operational requirements of combat forces assigned to USARAK. Fort Wainwright is responsible for all installation management requirements to include public safety and security, environmental stewardship, resource management, services and programs to enable combat readiness, and community/family support services and programs. Environmental and natural resources management now falls under USAG FWA.

In 2001, Space and Missile Defense Command took command of Fort Greely. Fort Greely was reduced to approximately 7,000 acres comprising the Fort Greely cantonment area. The remainder of the 660,000 acres formerly known as Fort Greely was transferred to Fort Wainwright and is now known as Donnelly Training Area.

The Air Force is a major user of Fort Wainwright and Donnelly Training Area for routine training and major flying exercises. The Air Force uses Fort Wainwright's Stuart Creek Impact Area and Donnelly Training Area's Oklahoma and Delta Creek impact areas as tactical air-to-air and air-to-ground weapons ranges, for low and high altitude bombing by B1 and B52 aircraft. The Yukon Measurement and Debriefing System, a computerized system that can create "air wars" of up to 36 aircraft simultaneously, has been installed on Yukon and Donnelly Training Areas. Air Force pilots are debriefed to show how they reacted to enemy aircraft and various other simulated conditions. The Stuart Creek and Oklahoma Impact Areas are equipped with Air Force targets, unmanned radar emitters, anti-aircraft threat simulators, and electronic scoring sensors.

The Army Campaign Plan is driving changes to future mission requirements. The Army is continuing its restructuring from a division based force to a brigade based force. The impacts of the continued withdrawal for military use of the Yukon Training Area and Donnelly Training Area were analyzed in the *Alaska Army Lands Withdrawal Renewal Final Legislative Environmental Impact Statement* (USARAK 1999). In the *Transformation of U.S. Army Alaska Final Environmental Impact Statement* (USARAK 2004) USARAK military mission impacts were analyzed. The Transformation Environmental Impact Statement addressed the regular ongoing impacts of the current mission as well as the predicted impacts due to the transformation of the 172nd Brigade (Separate) into a Stryker Brigade Combat Team. Future Army force restructuring may bring about changes to the military mission in Alaska. The *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* (USARAK 2009) evaluates the environmental effects of the U.S. Army proposal to station and train a new aviation unit in Alaska. Impacts of changes in ongoing and future training activities would be considered in separate environmental documents.

1.4 Partnership

A partnership is defined as a process by which two or more organizations with shared interests act as a team to achieve mutually beneficial goals. Fort Wainwright undertakes management of its lands with a number of federal, state, local, and public partners. Land management issues do not stop at property boundaries, but instead have an ecosystem or watershed dimension. All agencies are tied by policy to an ecosystem management approach to land management. Cooperative relations among the military services and other land management agencies foster regional approaches to dealing with stewardship issues that provide benefits beyond what could be achieved by each agency separately.

1.4.1 Federal Agencies

Fort Wainwright partners with other federal agencies for natural resources management support, including the Department of Interior (USFWS, BLM, U.S. Geological Survey, and Office of Aircraft Services), Department of Agriculture (U.S. Forest Service and Natural Resources Conservation Service), as well as other Department of Defense agencies (U.S. Army Corps of Engineers Research and Development Laboratories). Accredited conservation representatives of federal agencies furnishing professional advice and technical assistance under this plan will be allowed access to the installation, in accordance with appropriate arrangements.

The USFWS is a partner, along with the Army and the ADFG, in the management of fish and wildlife on Fort Wainwright lands. The Department of Interior, BLM is the Secretary of Interior's authorized delegate for jurisdiction responsibilities regarding vegetative (i.e., timber) and mineral resources on specific Fort Wainwright lands. The U.S. Forest Service provides technical assistance for forest management on Fort Wainwright's lands. The Natural Resources Conservation Service cooperates in land management and soil conservation on Fort Wainwright posts. The Department of Interior, Office of Aircraft Services provides reimbursable contract aircraft for implementation of this INRMP. U.S. Army Engineer Research and Development Laboratories - Cold Regions Research and Engineering Laboratory provides cooperative support in water quality, hydrology, vegetative, and permafrost studies.

1.4.2 State Agencies

Fort Wainwright also partners with a number of state agencies with expertise in natural resources management. The Garrison Commander provides installation access, subject to safety requirements and military security to designated State officials at such times and under such conditions as mutually agreed between the Garrison Commander and the appropriate designated official of the state in which the installation is located. The ADFG is a signatory and cooperating agency in the implementation of this plan as required by the Sikes Act. The Alaska Department of Natural Resources, Division of Forestry, is a cooperating agency for forest management on Fort Wainwright lands. Fort Wainwright partners with the Salcha-Delta Soil and Water Conservation District for enhancing, rehabilitating, and maintaining Fort Wainwright and Donnelly Training Area training lands to ensure their continued long-term use and effectiveness. The Alaska Department of Environmental Conservation regulates air and water quality on all Fort Wainwright posts and sub installations (including prescribed burning). The Alaska Department of Commerce and Economic Development is a state agency interested in Fort Wainwright's role in supporting tourism within Alaska.

Fort Wainwright also partners with universities for natural resources management expertise. Experts from universities have provided specialized knowledge needed to effectively manage natural resources on Fort Wainwright lands.

1.4.3 Local Government

Local governments are important partners in natural resource management of military lands in Alaska. Fort Wainwright is primarily involved with the Fairbanks North Star Borough and the city of Delta Junction.

1.4.4 Tribal Government

Maintaining a working relationship between the Army and Alaska Native tribes has emerged as an important component of the Army's operations in Alaska. Fort Wainwright and associated training areas lie within the traditional lands of the Tanana Athabascan tribes of interior Alaska. These Army-withdrawn lands hold resources that were traditionally used by Alaska Native tribes and therefore, tribal governments continue to have an interest in the management of these lands.

1.4.5 Non-Governmental Agencies

Non-government organizations play an extremely important role in the management of natural resources on Army lands in Alaska. Fort Wainwright participates with the Boreal Partners in Flight, a partnership of federal and state agencies, educational institutions, and nongovernmental organizations committed to managing neotropical migratory birds. Fort Wainwright is a partner with The Nature Conservancy in an effort to evaluate regional ecosystem management. Fort Wainwright also participates on the state of Alaska Invasive Species Council. Restoration Advisory Boards may at times be used to explain changes in future INRMP planning processes and invite public comment. Fort Wainwright partners with the Interior Alaska Airboat Association, participates on the Delta Bison Working Group, works with the Tanana–Yukon Historical Society, and cooperates with the Tanana Chiefs Conference.

1.5 Joint Management and Stewardship

Almost all of Fort Wainwright lands are withdrawn from the public domain for military use. The BLM partners with Fort Wainwright to jointly manage these withdrawn lands. Joint management refers to Congressionally-directed shared responsibility by the BLM and the Department of Defense for organizing, controlling, and supervising activities on certain withdrawn federal lands. Joint use may or may not involve joint management. Both joint use and joint management require joint stewardship. Joint stewardship refers to the working relationship entered into between Fort Wainwright and the BLM for the care of withdrawn federal lands in Alaska and associated resources used by USARAK for military mission requirements.

The majority of the land currently used by Fort Wainwright is on long-term withdrawal from public domain lands originally assigned to the BLM. Provisions for management of these lands are generally specified in each of the public laws, public land orders, executive orders, and other enabling documents that withdrew the land. Whenever the military uses withdrawn public land, it incurs legal and moral responsibilities for the stewardship of the land and its resources. Residual responsibility for Fort Wainwright withdrawn lands remains with the BLM, which retains interest in the stewardship of the transferred parcel, even though the land is under Department of Defense's long-term management.

The reason Fort Wainwright land is withdrawn from other public use to the military is to enhance military readiness in the interest of national defense. If the land was intended to be managed primarily for multiple uses, it would not be managed by a military service. Under Fort Wainwright management, land is used primarily for national security purposes (e.g., training and testing) but will also be managed to accommodate additional uses as long as they do not impinge on the primary military readiness mission.

Multiple-use of the lands it manages is an integral part of the mission of the BLM. As defined by Federal Land Policy and Management Act, multiple-use implies that each authorized use of the land has an equal level of priority. Department of Defense, on the other hand, is a single mission agency. As such, it has a single, mission-oriented use for the land it manages: military readiness for national defense. The quality of life of Department of Defense's personnel is also an important component of Department of Defense's national defense mission. In support of their specific missions, Department of Defense's services and agencies implement a variety of land management practices on their installations that support military readiness and quality of life programs. For Department of Defense multiple-use is *an approach to land management* rather than an element of its mission. A variety of land management tools such as hunting, fishing, nature trail maintenance, watchable wildlife programs, and the maintenance of groomed open spaces may be used in the INRMP in support of both quality of life programs and military training and testing requirements. By using a mix of these land management tools, Department of Defense undertakes a multiple-use approach to land management while still meeting the single mission use of the land (military readiness for national defense). An important aspect of this type of multiple-use approach to land management, however, is that it is employed only to the extent that it does not conflict with the military training and testing components of the overall national defense/readiness mission of the agency. For instance, Fort Wainwright manages lands with many of the same protections as wilderness land or wild and scenic rivers. However, a Wilderness designation or Wild and Scenic Rivers designation is incompatible with the intent of the military land withdrawals and the military training mission.

As noted earlier, where withdrawal legislation specifies joint management, collaboration between the BLM and Department of Defense is essential. Stewardship, however, is an inherent responsibility of anyone who has activities on the land regardless of legislated land management responsibilities. Stewardship implies acting responsibly in the public interest in the use and, as appropriate, restoration, improvement, preservation, and protection of federal lands and their associated resources. Good stewardship is a fundamental policy of all land management agencies and a mandate for all users of the land.

1.6 Encroachment and Land Use Planning

Encroachment is a significant issue in land use planning. The Department of Defense has defined encroachment as the cumulative result of any and all outside influences that inhibit normal military training and testing. Similarly, the Army considers encroachment as any external and / or internal actions or requirements that restrict training. Encroachment is an everyday reality for most installations, but it is important to recognize that it does not occur instantaneously. Encroachment reflects the cumulative result of a slow but steady increase in influences affecting the use of installation ranges. Societal demands near and around installations are constantly changing and the Army needs innovative methods to deal with that change. As a land-based force, the Army needs land area to train. It faces a paradox. The platforms, weapons, and systems it uses are becoming more technologically advanced. When combined with the changes in doctrine and tactics, this creates requirements for more training space. Conversely, encroachment reduces the size of the area available for military training.

In the last decade, the Army in Alaska has experienced a period of growth and transformation. The Soldier population has increased dramatically. Transformation included a change from a light infantry brigade to a Stryker Brigade and the deployment/train/reset cycle has little flexibility. These changes have resulted in a greater operations-tempo and a need to readjust training and reconfigure training areas. All of this is driving how the garrison must adopt new ways of supporting the mission. One tool that will help the Army in Alaska to deal with these changes will be to develop an Army Compatible Use Buffer (ACUB) program.

The ACUB program is an integral component of the Army's triple bottom line: mission, environment, and community. In recent years, Army Installations have begun to experience increasing encroachment from a variety of sources, including population growth, urban land use, and environmental requirements. The ACUB program proactively addresses encroachment and allows the Army to avoid costly workarounds or compromises in training realism that can be caused by encroachment. The ACUB program is a powerful tool that allows the military to contribute funds to a partner, who then purchases easements or properties from willing landowners that might present an encroachment threat if developed or expanded. These partnerships preserve high-value habitat and limit incompatible land use in the vicinity of military installations.

The USAG FWA goal is to utilize ACUB to protect "At Risk" wetlands and obtain credits to off-set future impacts and to utilize ACUB to avoid potential noise and safety conflicts with residential areas. The highest priority for the USAG FWA ACUB program is the protection of lands adjacent to the Ladd Army Airfield, the Small Arms Complex, and along the Alaska Highway North of the Donnelly Training Area.

The legal basis for the ACUB program is 10 U.S.C. 2684a, *Agreements to Limit Encroachments and Other Constraints on Military Training, Testing, and Operations*, which was enacted by Congress as Section 2811 of the National Defense Authorization Act for fiscal year 2003. This authority represents a powerful tool and unique opportunity for the Department of Defense to work in partnership with states, other governments, and public or private environmental and conservation groups to achieve a common goal of sustainability. It also provides authority for the ACUB program.

1.7 Responsibilities

Fort Wainwright has primary responsibility for military uses of the withdrawn lands in Alaska. Under the Sikes Act, Fort Wainwright is responsible for preparing, updating, and implementing this INRMP. Since all uses and projects described in this plan support the overall military mission, implementation of this plan is defined as a military use. Fort Wainwright is responsible for ensuring that all federal uses would comply with federal law, and with state law to the extent consistent with the federal mission. The BLM retains stewardship responsibilities and is responsible for all nonmilitary uses and ensures that all nonfederal uses of the withdrawal must conform with applicable federal and state laws and regulations concerning protection of air, soil, and water. The BLM is the interface with the public for all requests for resources on withdrawn lands and, through the Alaska Fire Service, is responsible for fire suppression on Fort Wainwright lands. The USFWS and ADFG are responsible for the management of fish and wildlife populations on all Fort Wainwright lands.

Within Department of Defense, many individuals and organizations listed below have responsibilities for the overall implementation of this INRMP. Responsibilities for each program are listed in greater detail in Chapter 3 and the Annexes to this INRMP.

The Fort Wainwright Garrison Commander is directly responsible for operation and maintenance of Army lands in Alaska, including implementation and enforcement of this INRMP. The Commander is personally liable for compliance with laws pertaining to implementation of this plan. Natural resources are managed through the Fort Wainwright Directorate of Public Works, Environmental Division, Conservation Branch, under the direction of the Garrison Commander. The Conservation Branch is the primary organization directly responsible for implementing this plan.

The ranges on Fort Wainwright lands are managed through the USARAK G-3, Training Support Systems. The G-3 has responsibility for managing range complexes; coordinating military training; and releasing training areas for forestry, land rehabilitation, and recreational use. Integrated Training Area Management is also a part of the G-3. The Directorate of Family, Morale, Welfare and Recreation promotes organization and development of recreational opportunities and facilities. This Directorate manages most outdoor recreation with the exception of hunting, fishing, and trapping. Law enforcement on Fort Wainwright lands is managed through the Directorate of Emergency Services. Implementation of this plan also requires the assistance of other Fort Wainwright directorates and organizations, including Directorate of Logistics (supply and transportation), Resource Management Office (budget, personnel, and equipment authorizations), Regional Contracting Office (purchasing), Public Affairs Office(public awareness programs), and Staff Judge Advocate (legal assistance).

Fort Wainwright's higher headquarters, Installation Management Command-Pacific Region located at Fort Shafter, Hawaii, will assist with development and implementation of conservation programs. The Installation Management Command provides environmental funding for the implementation of this INRMP.

The United States Army Environmental Command, located at Fort Sam Houston, Texas, provides oversight, centralized management, and execution of Army environmental programs and projects. It provides support capabilities for NEPA, endangered species, cultural resources, environmental compliance, and related areas. The United States Army Corps of Engineers, Alaska District, assists Fort Wainwright by administering contracts for outside or other agency support. It also is responsible for issuing wetlands permits in accordance with Section 404 of the Clean Water Act. The Cold Regions Research and Engineering Laboratory supports northern military installations and has an interest in natural resources management on Fort Wainwright lands.

1.8 Public Review and National Environmental Policy Act

NEPA requires federal agencies to consider the environmental consequences of proposed major federal actions. The premise of NEPA is to provide environmental information to public officials and citizens before decisions are made and actions are taken. The process is intended to help decision-makers make decisions that are based on timely and scientifically accurate information. The analysis must fully disclose the environmental effects of the action and demonstrate that the project proponent and the decision-maker have taken an interdisciplinary "hard look" at the environmental consequences of implementing a major federal action. All proposed activities, military and nonmilitary, for the withdrawn lands are evaluated under the authority of NEPA for impact on air, soil, water, and vegetative resources.

1.8.1 Army NEPA Implementing Regulation (32 CFR 651) and Army Regulation 200-1

The Army's NEPA implementing regulation, 32 CFR 651—Army Regulation 200-2 (*Environmental Effects of Army Actions*), dated 29 March 2002—dictates policies, responsibilities, and procedures for integrating environmental considerations into Army planning and decision-making. It implements the Council on Environmental Quality's NEPA regulations and directs Army installations to integrate environmental analysis as much as practicable with other environmental reviews, laws, directives, and executive orders. This regulation requires that natural resources management plans be evaluated for environmental impacts (32 CFR 651.10(b)).

Army Regulation 200-1 (*Environmental Protection and Enhancement*), dated 13 December 2009, outlines policy, procedures, and responsibilities for the conservation, management, and restoration of land and the

natural resources thereon consistent with the military mission and other applicable national policies. Army Regulation 200-1 requires that installations "assure NEPA requirements are satisfied when preparing the INRMP." Army Regulation 200-1 further states, "It is Army policy to integrate environmental reviews concurrently with other Army planning and decision-making actions to avoid delays in mission accomplishments."

1.8.2 Integrated Natural Resources Management Plan and National Environmental Policy Act Integration

The Army's NEPA implementing regulation, 32 CFR 651.14 (a), states that "The Army goal is to concurrently integrate environmental reviews with other Army planning and decision-making actions, thereby avoiding delays in mission accomplishment." To achieve this goal, proponents shall complete NEPA analysis as part of any recommendation or report to decision-makers prior to the decision (subject to 40 CFR 1506.10). Early planning (inclusions in Installation Master Plans, INRMPs, Integrated Cultural Resource Management Plans, acquisition strategies, strategic plans, etc.) will allow efficient program or project execution later in the process.

Fort Wainwright prepared an Environmental Assessment and final Finding of No Significant Impact dated 27 February 2007 concurrent with the 2007 Fort Wainwright INRMP update. The Environmental Assessment analyzed the potential environmental consequences of implementing the 2007 INRMP. The Environmental Assessment was made available for public review over a 30-day period. Fort Wainwright collected comments, utilized the information to improve the INRMP, and prepared a final Environmental Assessment. All comments received were recorded and considered.

Fort Wainwright is not proposing new policies, procedures, plans or types of projects that cause impacts different from or greater than those analyzed in the 2007 environmental analysis. As such, the environmental impacts associated with the proposed INRMP updates have already been considered as part of the 2007 Environmental Assessment and final Finding of No Significant Impact. Fort Wainwright will conduct a NEPA review of the proposed updates to the INRMP. Conclusions of the review will be documented in a Record of Environmental Consideration for this INRMP.

1.8.3 Public Review and National Environmental Policy Act

Public review of the 2007 INRMP and Environmental Assessment, as required by the Sikes Act, Army Regulation 200-1, and 32 CFR 651 was accomplished through the NEPA process.

1.9 Cultural Resource Protection

Cultural resources protection programs on Fort Wainwright lands are conducted in accordance with the National Historic Preservation Act (16 U.S.C. 470, as amended), the Archeological Resources Protection Act (16 U.S.C. 470aa-mm), the American Indian Religious Freedom Act (42 U.S.C. 1996), the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.), Department of Defense Instruction 4715.16 (*Cultural Resources Management*), and Army Regulation 200-1 (*Environmental Protection and Enhancement*). The BLM also has responsibility for cultural resources compliance on withdrawn lands.

Natural resource projects are sometimes overlooked as potential causes of adverse impacts to archeological sites. Natural resources and cultural resources managers at Fort Wainwright will work closely with one another during development of natural resources projects.

Natural resource activities such as vegetation clearing, timber removal, firebreak construction, and training land rehabilitation are potentially damaging to cultural resources. Army Regulation 200-1 and the laws upon which it is predicated require that such undertakings be accomplished in a manner consistent with protection of cultural resources.

Natural resource projects with ground-disturbing activities will be processed through the Fort Wainwright cultural resources manager to prevent activities from impacting cultural resources. Furthermore, the cultural resources manager will be consulted during long-range policy planning, such as this INRMP.

Fort Wainwright is currently developing the Integrated Cultural Resources Management Plan. Natural resource projects will be reviewed and evaluated per the procedures outlined in the Fort Wainwright Integrated Cultural Resources Management Plan. The Fort Wainwright Cultural Resource Manager will continue to review proposed projects by consulting guidelines provided in implementing regulations for the National Historic Preservation Act (36 CFR 800) to determine their effect on cultural resource sites. Any project assessed as having an effect on a cultural resource site will be coordinated with Alaska State Historic Preservation Officer.

1.10 Pending and Unresolved Issues

The 2013 INRMP acknowledges pending or unresolved activities or decisions outside the authority of the INRMP that may affect natural resources on Army lands.

This INRMP update does not propose changes to public access or use in the Tanana Flats Training Area. However, the construction of a dual-use railroad / military bridge across the Tanana River into Tanana Flats Training Area is likely to result in new impacts to natural resources in Tanana Flats Training Area. The analysis of the impacts of increased recreational use and the decision to allow or deny public access across the bridge was made in the Railroad Expansion Environmental Impact Statement / Record of Decision.

This INRMP update does not propose changes to public access on Beaver Creek Road through the Air Force Tactical Application Center. However, The Air Force is currently working to update their license for use of the Air Force Tactical Application Center that would permanently close Beaver Creek Road to recreational traffic.

1.11 Integrated Natural Resource Planning

The centerpiece of natural resources planning and resourcing is the INRMP. An INRMP guides the natural resources management programs at each installation. Implementation of the INRMP measures, maintains, protects, and enhances the ecological integrity of the training lands and the biological communities inhabiting them. An INRMP is prepared to assist installation commanders in their efforts to conserve and rehabilitate natural resources “consistent with the use of military installations to ensure the preparedness of the Armed Forces.” INRMPs are intended principally to help Installation Commanders manage natural resources more effectively so as to ensure that installation lands remain available and in good condition to support the installation's military mission (i.e., ensure “no net loss in the capability of military installation lands to support the military mission of the installation”).

Fort Wainwright prepares this INRMP in cooperation with the USFWS, BLM, and ADFG. This interagency participation results in a document that reflects the mutual agreement of Department of Defense, Department of the Interior, and the State of Alaska concerning conservation, protection, and management of natural resources. Fort Wainwright also provides an opportunity for the public to review

and submit comments on this INRMP. More details regarding the preparation, update and implementation of the INRMP can be found in Chapter 4.

1.11.1 Purpose of the Plan

The INRMP establishes policies, programs, prescriptions, projects and procedures that USAG FWA will use to manage natural resources on Army training lands in Alaska. The INRMP contains goals and specific objectives necessary to (1) sustain "no net loss" in the capability of military lands to support mission requirements, (2) support stewardship of natural resources, (3) ensure compliance with applicable environmental laws, and (4) maximize public access within the constraints of the military mission while protecting public safety and conserving the environment. It is the intent of the Army to clearly and openly express these goals, objectives and policies to the public through this INRMP. The secondary purpose of this INRMP is to guide Fort Wainwright natural resources managers and personnel in their decision-making regarding management of military land in Alaska and the implementation of proposed natural resource projects. The INRMP consolidates other related Army natural resource planning documents in one place, including the Ecosystem Management Plan, Integrated Wildland Fire Management Plan, Endangered Species Management Plan, Forestry Management Plan, Watershed Management Plan and Outdoor Recreation Management Plan. The INRMP also incorporates by reference the applicable BLM Resource Management Plans for Yukon and Donnelly Training Areas. The final INRMP reflects mutual agreement of Sikes Act partners USFWS and ADFG concerning the conservation of the natural resources under their respective legal authorities. Implementing this INRMP provides a land management program that conserves land as an essential asset for training, provides excellent stewardship, complies with environmental laws, and provides recreational opportunities that contributes to the quality of life.

1.11.2 Scope of the Plan

The focus of this INRMP will be on the management of natural resources on Fort Wainwright lands. The management measures have been developed based on the current conditions of the resources, and the military mission and activities as they are anticipated. This INRMP will guide natural resources management of Fort Wainwright lands and provide a solid foundation from which to build and continue the program into the future.

1.11.3 Relationship to Other Plans

1.11.3.1 BLM Resource Management Plans

The Federal Land Policy and Management Act of 1976 requires the BLM to develop, maintain, and, when appropriate, revise land use plans. The objective of BLM's land use planning is to ensure that public lands are managed under the principles of multiple use and sustained yield. The BLM has developed a comprehensive land use planning base consisting of decisions reached in its resource management plans. The BLM views land management as an ongoing process of decision-making, implementation, monitoring and assessment, and adjustment that allows for continuous corrections and reduces the need for major plan revisions. New information or proposals might necessitate a plan revision or an update to a plan's associated NEPA analysis. BLM's nine-step planning process, in 43 CFR 1600, integrates the NEPA decision-making process. New resource management plans and resource management plan revisions require an Environmental Impact Statement.

Public Law 106-65, which withdraws significant portions of Fort Wainwright and Donnelly Training Area lands for 25 years from the public domain, requires that the BLM prepare Resource Management Plans for the military withdrawal. Pursuant to PL 99-606, which withdrew portions of Fort Wainwright

and Donnelly Training Area lands from 1986 to 2001, the BLM prepared Resource Management Plans for Yukon Maneuver Area (currently named Fort Wainwright Yukon Training Area) (BLM 1995b) and Fort Greely Maneuver Area and Air Drop Zone (currently named Donnelly Training Area) (BLM 1995a). In 1999 Congress passed PL 106-65 and Title XXX of the law extended the withdrawals 25 years to 2026. Again, the BLM was required to manage the withdrawals in conjunction with the military through Resource Management Plans. The BLM evaluated the existing Resource Management Plans and determined that the plans were still valid and that new Resource Management Plans were not needed to meet the requirements of PL106-65. An amendment, completed in 2002, was necessary to address the 25-year extension of the withdrawal. The BLM outlined 18 on-going and 24 proposed actions necessary to implement the Fort Greely Resource Management Plan (described in Chapter 4, Section 4.5.6) and 20 on-going and 17 proposed actions necessary to implement the Yukon Maneuver Area Resource Management Plan (described in Chapter 4, Section 4.4.6). The Fort Wainwright INRMP does not conflict with and is consistent with the actions listed in the current BLM Resource Management Plans for Yukon Maneuver (Training) Area and Fort Greely (Donnelly Training Area).

1.11.3.2 Range Complex Master Plan

The USARAK Range Complex Master Plan outlines the range development requirements for Fort Wainwright training lands. The range development plan creates the framework within which natural resources management occurs. The INRMP does not conflict with the range development plan; rather, it complements the siting of new range facilities by providing information that minimizes impact to natural resources.

1.11.4 Structure of the Plan

This INRMP is structured to demonstrate direct support of the overall military mission, which includes stewardship of natural and cultural resources, compliance, quality of life, and military training support. Every single project and task in the INRMP is focused to add to the accomplishment of one or more of these natural resources goals.

The goal of this document is to consolidate all natural resource plans and ensure proper implementation at the installation level. The goal is to create an INRMP that supports Fort Wainwright's readiness mission, meets compliance requirements, provides for sustainment and rehabilitation of natural resources, and provides a consistent review process for legislatively mandated cooperators. This document streamlines the INRMP into operational, useable, and smaller documents. The overall INRMP will include the Main Plan, Annexes (component plans), Supplements, and Prescriptions. The sections will be made up of various topics that will fulfill the INRMP purpose.

The INRMP Environmental Assessment contains the environmental analysis of the INRMP and potential effects upon the environment due to the proposed plan and its alternatives. In addition to evaluating the environmental impacts associated with natural resources management, the Environmental Assessment afforded the public an opportunity to comment on the plan.

1.11.5 Integration

Integrated natural resources planning is accomplished through revising or updating the INRMP at least every five years. Integrating the many components of natural resources can be a complex challenge. One of the objectives of ecosystem management in Fort Wainwright is to develop a process to objectively identify requirements for all species and users of the environment. In addition, natural and cultural resources projects can only be classified as military use (and therefore valid expenditures of military funds) if there is a direct link back to the accomplishment of the overall military mission. The Fort

Wainwright INRMP is prepared in coordination with the Fort Wainwright Master Plan; Range Complex Master Plan; Integrated Cultural Resources Management Plan; Installation Pest Management Plan; Installation Restoration Plan that addresses contaminants covered by the Comprehensive Environmental Response, Compensation, and Liability Act and related provisions; Wildlife Airstrike Hazard Plan; and other appropriate plans and offices. It is not intended that the Fort Wainwright INRMP will function as a comprehensive compilation of detailed information on all these related topics. Rather, the goal of the INRMP is to briefly summarize the key interrelationships with these plans, reference where the plans may be obtained, and describe where detailed information can be found.

1.11.6 Review and Status

The Sikes Act requires that an INRMP be reviewed as to operation and effect by the USFWS and the ADFG on a regular basis, but not less often than every five years. The Fort Wainwright INRMP was last formally reviewed for operation and effect in April 2007 resulting in agency signatures on the INRMP. Department of Defense Instruction 4715.03 requires that INRMPs be reviewed annually in cooperation with the other internal and external parties to the INRMP. This requirement does not mean that the INRMP necessarily needs to be revised or updated annually. Rather, the requirement emphasizes that the review is intended to determine whether existing INRMPs are being implemented to meet the Sikes Act requirements and contribute to the conservation and rehabilitation of natural resources on military installations.

An INRMP that requires significant edits because of changes to mission or natural resources, comments received from a review for operation and effect, or other changes is considered an INRMP revision. INRMP revisions should be infrequent, only occurring when the existing INRMP is determined to be inadequate, installation mission or physical features have changed significantly, newly listed species or species-at-risk require significant changes to existing management practices, or if the construction or training tempo is dramatically increased. INRMP revisions require additional public and NEPA review. An INRMP that requires minor edits to address new information or management priorities is considered an INRMP update. INRMP updates do not require additional public or NEPA review.

The initial Sikes Act-compliant Fort Wainwright INRMP was signed by the Commander, U.S. Army Garrison Alaska; Director, USFWS Region 7; and Commissioner, ADFG in 1998. The FWA INRMP was revised in 2002 and again in 2007 due to substantial changes in natural resources management proposals, as well as agency, tribal and public stakeholder comment. Based on (1) no changes recommended during the annual 2012 review with USFWS and ADFG; (2) no change in the FWA mission; (3) no changes to Fort Wainwright natural resource policy, programs, prescriptions, or procedures; (4) no change to the type of projects proposed in 2007; and (5) minor changes to the INRMP document itself, Fort Wainwright has concluded that an INRMP revision is not necessary and, therefore, Fort Wainwright proposes to implement an INRMP update in 2013.

1.11.7 Changes from the Previous Integrated Natural Resources Management Plan

The 2013 Fort Wainwright INRMP no longer applies to Fort Richardson. All references to natural resources management at Fort Richardson have been removed from the 2013 Fort Wainwright INRMP. Due to Base Realignment and Closure 2005, Fort Richardson was realigned and is now part of Joint Base Elmendorf-Richardson. As the lead service, the Air Force assumed management of natural resources on Fort Richardson on 1 October 2010. Fort Richardson lands are now included in the Joint Base Elmendorf-Richardson INRMP.

Per Army guidance, the format of the 2013 Fort Wainwright INRMP has changed. The prescriptions (which were in a separate appendix) were added to Chapter 4 of the main plan. This format change did not result in any substantive changes to the programs, policies, prescriptions, or procedures implemented in the 2007 INRMP.

Per Army guidance, the specific dates attached to the INRMP will be de-emphasized. The INRMP must be reviewed annually and evaluated for operation and effect at least once every 5 years, but if the policies, programs, procedures, and practices do not change substantially, with agreement of the Sikes Act partners, the existing plan will remain in effect. Specific projects will be included in an appendix and will be updated annually as they are funded, implemented, and completed but project updates will not require new signatures from the Army or its Sikes Act partners as long as those projects are the same project types analyzed in previous INRMPs and NEPA documentation.

The 2013 Fort Wainwright INRMP incorporates changes made in the newly revised Fort Wainwright Regulation 190-13, *Conservation Program – Enforcement*.

The 2013 Fort Wainwright INRMP incorporates all PL 106-65 BLM Resource Management Plan (applies to Yukon Training Area and Donnelly Training Area) actions.

The 2013 Fort Wainwright INRMP adds a section on the ACUB program.

The 2013 Fort Wainwright INRMP includes a new Wildlife Air Strike Hazard plan.

1.11.8 Plan Implementation

The Sikes Act Improvement Act requires not just preparation and update of an INRMP, but "implementation" of the plan. The following section discusses the definition and funding implications of implementation. Implementation anticipates the execution of all "must fund" projects and activities in accordance with specific timeframes identified in the INRMP.

An INRMP is considered to be implemented if an installation:

- Actively requests, receives, and uses funds for "must fund" projects and activities.
- Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP.
- Coordinates annually with all internal and external cooperating offices.
- Documents specific INRMP action accomplishments undertaken each year.

Natural resource requirements defined by the Office of the Secretary of Defense as environmental "must fund" are those projects and activities required to meet recurring natural resources conservation management requirements or current natural resources compliance needs. The Army equivalent to Office of the Secretary of Defense's "must fund" projects are projects as described in classes 0, 1 and 2 High in current Army policy and guidance for identifying environmental program requirements.

All projects listed in an INRMP are not necessarily "must fund." Implementation of INRMPs is a shared responsibility among those who use the land (e.g., trainers, facility managers, provost marshal) as well as those who ensure compliance and provide overall program oversight. Accordingly, projects necessary to implement INRMPs are not limited to environmental funds. However, INRMPs should include all projects.

Projects are contained in Chapter 4 of this INRMP and will be reviewed and updated annually upon completion of Army review and validation processes.

1.11.8.1 Achieving No Net Loss to Military Mission

The natural resources program, through this INRMP as well as the Integrated Training Area Management program, serves as mitigation for the military mission. Therefore, full implementation of this plan is required to achieve no net loss to the military mission.

1.11.8.2 Legislation and Decision Documents Requiring INRMP Implementation

Continuing implementation of the INRMP is a bedrock principle embedded in the Fort Wainwright land withdrawal legislation, PL 106-65, Military Lands Withdrawal Act. The *Alaska Army Lands Withdrawal Renewal Legislative Environmental Impact Statement* (USARAK 1999) analyzed the impacts of continuing withdrawal of Yukon Training Area and Donnelly Training Area and included a number of natural resources mitigation requirements. The mitigation included in the Legislative Environmental Impact Statement became law with the enactment of PL 106-65 in 2001.

Implementation of the Fort Wainwright INRMP has been cited as mitigation in a number of NEPA decision documents relating to stationing and training. In the *Transformation of USARAK Environmental Impact Statement* (USARAK 2006) *Record of Decision*, which addressed the regular ongoing impacts of the current mission as well as the predicted impacts of to the transformation of the 172nd Brigade (Separate) into a Stryker Brigade Combat Team and airborne infantry units into an Airborne Task Force, required full implementation of the INRMP and the natural resources management program. The *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* (USARAK 2009) evaluated the environmental effects of the U.S. Army proposal to station and train a new aviation unit in Alaska. This Environmental Impact Statement Record of Decision cited a number of natural resource programs and projects necessary to mitigate the stationing action.

Implementation of the Fort Wainwright INRMP was also required mitigation for the construction and operation of range facilities. INRMP implementation on Donnelly Training Area was required in the Record of Decision for the *Construction and Operation of a Battle Area Complex and Combined Arms Collective Training Facility within U.S. Army Training Lands in Alaska* (USARAK 2006). The *Range Complex and Training Land Upgrades Programmatic Environmental Assessment Finding of No Significant Impact* (USAGAK 2010) was based on the implementation of best management practices contained in the INRMP.

1.11.8.3 Supporting Sustainability of Military Mission

This INRMP is written with the intention of supporting military mission sustainability. Full implementation of this plan is required to achieve mission sustainability.

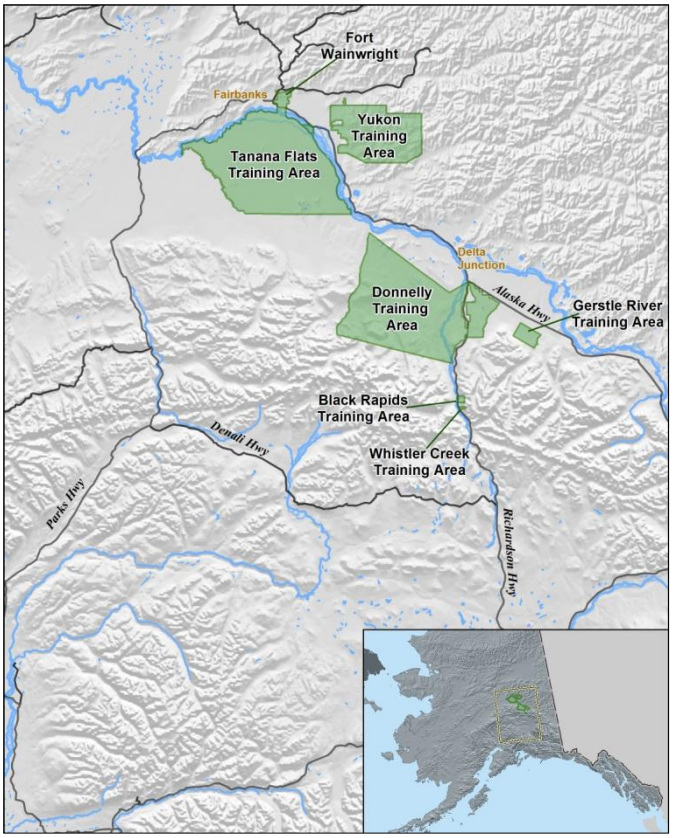
CHAPTER 2. INSTALLATION DESCRIPTION AND MISSION

Alaska is a state of extraordinary beauty with a wealth of natural resources. Its area of 586,412 square miles is roughly equal to one-fifth the size of the continental United States. Because of its strategic location, the Army has maintained a presence in Alaska since 1867. The land in Alaska controlled by the Army comprises almost 10% of the total training land available to the Army. The following chapter describes the installation setting and the mission for the U.S. Army in Alaska.

2.1 Installation Description

Fort Wainwright includes Main Post, Tanana Flats Training Area, Yukon Training Area, Donnelly Training Area, Gerstle River Training Area, Black Rapids Training Area, and Whistler Creek Training Area. Fort Greely is not part of Fort Wainwright but lies embedded within Donnelly Training Area, south of Delta Junction, Alaska. Fort Greely is approximately 6,795 acres consisting of a cantonment area, an airfield and missile fields. A general location of each installation with sub-installations is shown in Figure 2-1.

Figure 2-1. Location of Fort Wainwright Lands in Alaska.



2.1.1 Location and Neighbors

Fort Wainwright is located in central Alaska, north of the Alaska Range in the Tanana River Valley. The installation consists of the Main Post, Tanana Flats Training Area, Yukon Training Area, Donnelly Training Area, Gerstle River Training Area, Black Rapids Training Area and Whistler Creek Training Area. Fort Wainwright is the fourth largest Army training area in the United States. Tanana Flats Training Area is across the Tanana River from the Main Post. Tanana Flats Training Area occupies most of the land between the Wood and Tanana Rivers, stretching 32 miles south of the Main Post. Yukon Training Area is 16 miles east-southeast of Fairbanks, adjacent to Eielson Air Force Base. The Yukon Training Area is roughly rectangular, stretching 28 miles east-to-west and 17.5 miles north-to-south. Yukon Training Area encompasses much of the land between the Chena and Salcha Rivers, northeast of the Richardson Highway.

Fort Wainwright Main Post and Tanana Flats and Yukon Training Areas are within the Fairbanks North Star Borough, which is populated with several scattered developments. Fairbanks, on the western boundary of Fort Wainwright, is the largest city in the borough with a population of over 30,000, making it the second largest city in the state (2000 census data). The Fairbanks North Star Borough's population is over 82,000. The main cantonment area of Fort Wainwright lies within Fairbanks city limits. Residential developments have grown eastward, abutting the installation boundary along the North Post,

the main cantonment area, and the western side of the small arms range complex. A majority of the land surrounding Fort Wainwright is State of Alaska-owned land. Principal land use management categories include fish and wildlife habitat, public recreation, forestry, agricultural sale, and settlement. The Chena River State Recreation Area lies adjacent to Yukon Training Area's northern boundary and is managed for public recreation. Eielson Air Force Base adjoins the western boundary of the Yukon Training Area. The Tanana Valley State Forest lies north of Fort Wainwright with private and Fairbanks North Star Borough-owned land parcels to the south. Alaska Native corporation-owned and Native allotment parcels also border Fort Wainwright. Both Tanana Flats Training Area and Yukon Training Area are relatively isolated and reasonably protected from boundary encroachment, except for remote homesteads. Other developed areas include Fox and Chatanika to the north, and North Pole and Eielson Air Force Base to the east and south. Fort Greely is 90 miles to the southeast. The George Parks Highway, Steese Highway, Richardson Highway, Alaska Railroad, and the Trans-Alaska Pipeline bisect the area.

Donnelly Training Area is located 107 road miles southeast of Fairbanks and six road miles south of the junction of the Alaska and Richardson Highways. Donnelly Training Area is separated from Delta Junction by Jarvis Creek. Southeast Fairbanks Census Area's (a non-incorporated borough which covers a large area around Donnelly Training Area) population is over 6,000. Delta Junction (located adjacent to Donnelly Training Area) has 958 residents (2010 census - compared to 703 in 1970) (BLM and U.S. Army, 1994a). Census information for the unincorporated region around Donnelly Training Area is more informative and includes Deltana (2,251), Fort Greely (539) and Big Delta (591), which together with city of Delta Junction totals 4,339 residents. Gerstle River Training Area lies between Granite Mountain and Gerstle River. It is 29 miles southeast of Delta Junction and about three miles southwest of the Alaska Highway; the rectangular area is oriented northwest to southeast and measures about five miles, north to south, and nine miles, east to west. Black Rapids and Whistler Creek Training Areas are 39 miles and 43 miles, respectively, south of Delta Junction and east of the Richardson Highway within the Alaska Range.

2.1.2 Acreage, Acquisition, and Land Status

2.1.2.1 Acreage

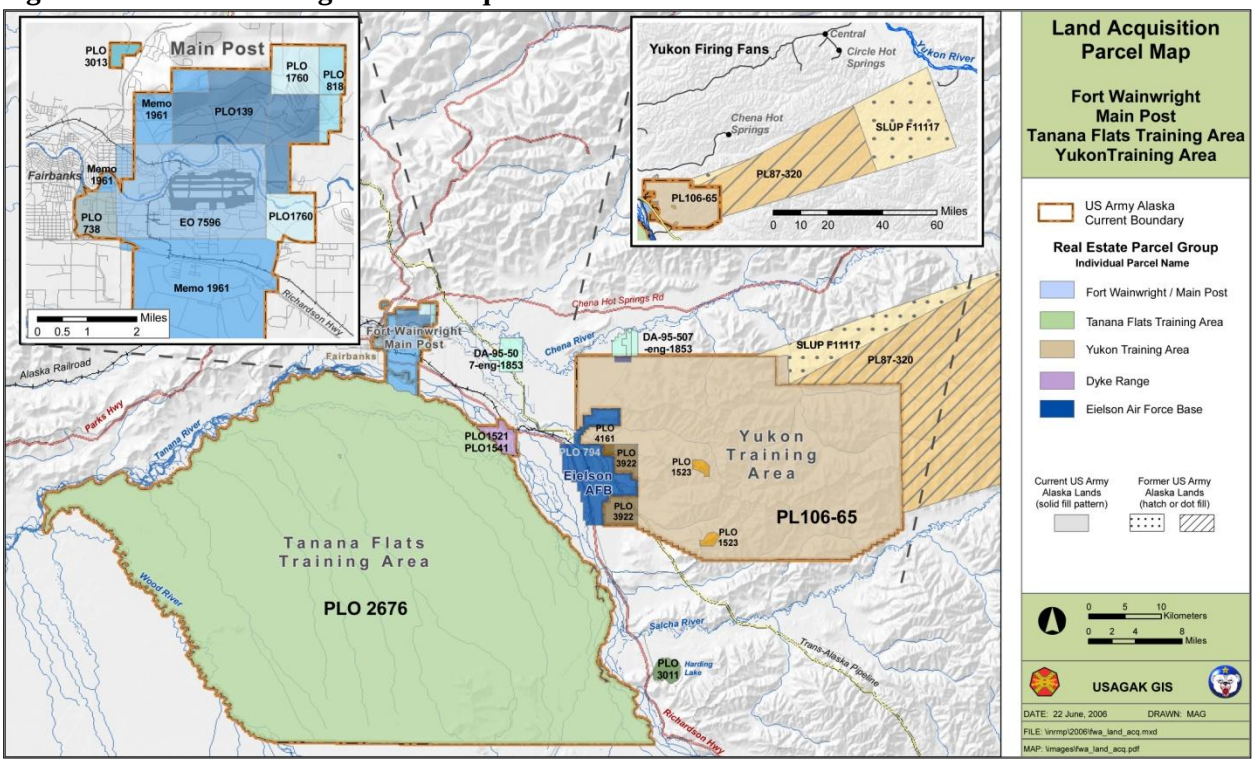
Fort Wainwright's Main Post, Yukon Training Area, and Tanana Flats Training Area comprise 928,017 acres. Fort Wainwright Main Post is 13,756 acres, including the small arms complex. It contains 818,710 acres of maneuver land and 65,964 acres of impact areas on both Tanana Flats Training Area and Yukon Training Area. Donnelly Training Area is composed of two sections. Donnelly Training Area West (approximately 522,000 acres) is located just south of Delta Junction and west of the Delta River. Donnelly Training Area East (approximately 112,000 acres) is located just south of Delta Junction and east of the Delta River. There are also three outlying sites: Gerstle River Training Area (20,580 acres), Black Rapids Training Area (4,112 acres) and Whistler Creek Training Area (542 acres).

2.1.2.2 Land Acquisition for Military Use

Fort Wainwright land acquisition is shown in Figure 2-2. Donnelly Training Area land acquisition is shown in Figure 2-3. Beginning in 1937, the area that is now the Fort Wainwright Main Post was withdrawn indefinitely by Presidential Executive Orders in the following years as listed in parentheses 7596 (1937), 8325 (1940), and 9526 (1940), and Public Land Orders 139 (1943), 690 (1950), 748 (1950), 738 (1951), 818 (1952), 854 (1952), 1760 (1958), and 3013 (1963). The Air Force transferred 13,623 acres to the Army in 1961. Executive Order 3825 and Public Land Order 135 took lands from this area. The Main Post now contains 13,756 acres of withdrawn lands (Center for Ecological Management of Military Lands 1998). Dyke Army Range is located along the Tanana River, between the Main Post and Eielson Air Force Base. This land was withdrawn indefinitely by Public Land Orders 1521 and 1541 in 1957. Dyke Army Range has 2,285 acres (USARAK 1999).

Tanana Flats Training Area (654,700 acres) was temporarily withdrawn from public land in 1941 through Executive Orders 8847 and 9526. Three hundred and twenty acres were returned to public use through Public Land Order 796 in 1952. In 1962, Public Land Order 2676 removed the expiration of use from Executive Orders 8847 and 9526.

Figure 2-2. Fort Wainwright Land Acquisition.



From 1956 through 1961, the Army obtained a permit from the Secretary of Interior for use of Yukon Training Area. Congress withdrew Yukon Training Area in 1961 for a 10-year term through Public Law 87-326. (After the Engle Act of 1958, all withdrawals of more than 5,000 acres for defense purposes require congressional approval). In 1971, Public Land Order 5240 extended the withdrawal through 1976. The Yukon Training Area withdrawal was renewed again in 1986 (Public Law 99-606) for a 15-year term. Land for two NIKE missile test sites on Yukon Training Area was withdrawn indefinitely through Public Land Orders 1345 (1956), 1523 (1957), and 1917 (1959). Public Land Orders 2768 (1962), 684 (1950), 3922 (1966), and 4161 (1967) adjusted acreage on Yukon Training Area. Acreage on Yukon Training Area now totals 257,275.66 (USARAK 1999).

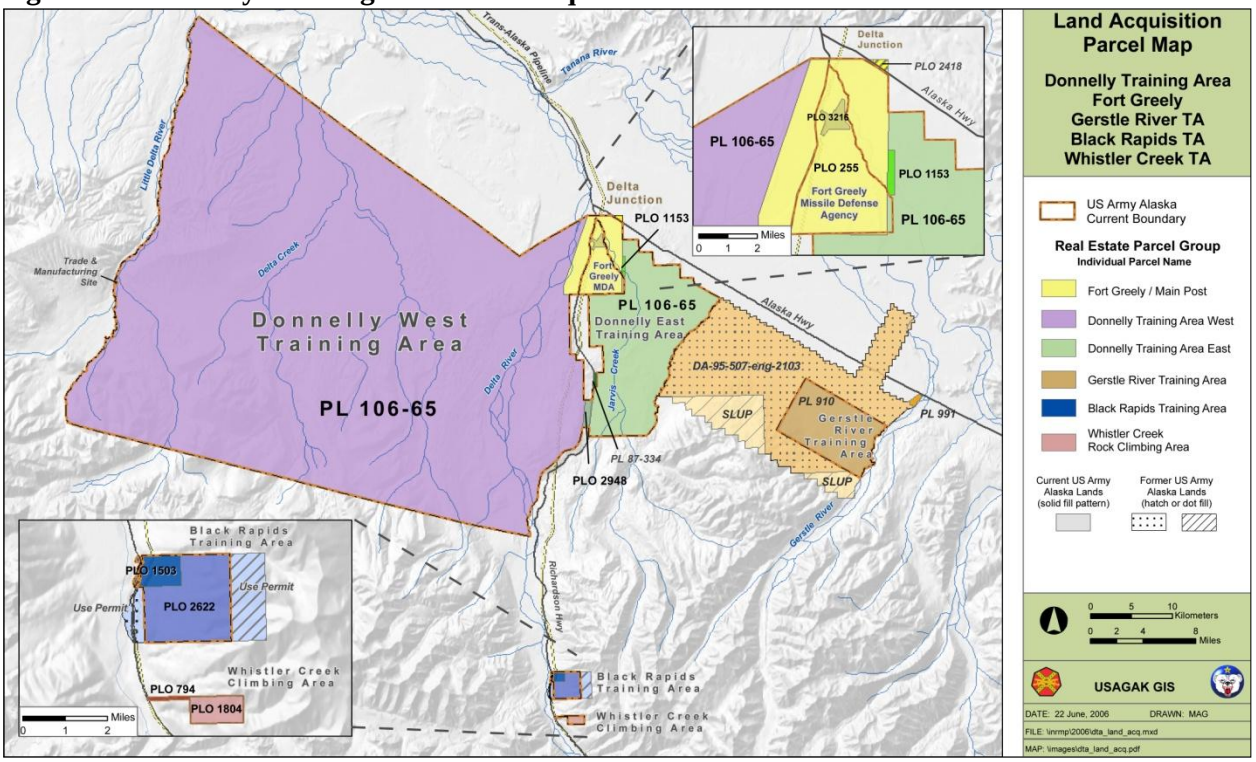
The public lands and interests in lands withdrawn and reserved by Public Law 106-65 include the Donnelly Training Area and the Yukon Training Area. This area is comprised of approximately 869,862 acres of land in the Fairbanks North Star Borough and the Unorganized Borough, Alaska, in accordance with Section 3012.

The Trans-Alaska Pipeline System transports crude oil from Prudhoe Bay to Valdez, Alaska. The Trans-Alaska Pipeline System right-of-way extends through the Yukon Training Area, Donnelly Training Area East, and Black Rapids Training Area. The Trans-Alaska Pipeline System right-of-way was authorized by the Trans-Alaska Pipeline Authorization Act of 1973. Its width is 50 feet plus the ground area occupied by the pipeline, which is approximately four feet. An additional right-of-way for the Alaska Natural Gas

Transportation System lies adjacent to the Trans-Alaska Pipeline System right-of-way. The width for the natural gas pipeline is 50 feet. A right-of-way has been approved by the Army and the BLM for the proposed Trans-Alaska Gas System, which runs roughly parallel with the Trans-Alaska Pipeline System and Natural Gas Transportation System.

A right-of-way to Golden Valley Electric Association was granted by the BLM with concurrence from the military to cross Tanana Flats Training Area for the construction, operation, and maintenance of a 230 kilovolt power transmission line between Fairbanks and Healy, Alaska. This right-of-way is 150 feet wide and crosses Tanana Flats Training Area from the southwest boundary at Wood River to the northern boundary at Goose Island. This right-of-way lies approximately one kilometer from the southernmost oxbows of the Tanana River. There are also a number of small outgrants here and there for other things (i.e., towers, power lines, etc.)

Figure 2-3. Donnelly Training Area Land Acquisition.



2.1.3 Installation History

Fort Wainwright was originally referred to as the Alaskan Air Base or Alaskan Air Corps Station. It was designated as Ladd Field in December 1939. The original installation served three purposes: the Cold Weather Test Station; an air sub-depot for repair and testing of airplanes; and the central Alaskan station of the Alaskan Wing, Air Transport Command, for transportation of air freight and ferrying Lend-Lease planes to Russia (USARAK 1991). By 1947, the Army Air Corps had separated from the Army to become the Air Force, and what was then known as Ladd Field was transferred to the Air Force. In 1961, the Army reassumed command of Ladd Field and renamed the installation Fort Wainwright, after General Jonathan M. Wainwright (USARAK 1995). On 1 July 1963, Fort Wainwright became the home of the 171st Infantry Brigade, with the 172nd Infantry Brigade established at Fort Richardson. U.S. Army Alaska operated two independent brigades until post-Vietnam era draw downs resulted in disbandment of the 171st Brigade in fiscal year 1973. At that time, the 172nd was headquartered at Fort Richardson with units

detached at Fort Wainwright. Further reorganization resulted in U.S. Army Alaska being disbanded on 31 December 1974, with Alaska installations falling under Forces Command (Higginbotham/Briggs & Associates 1991).

In 1986, the newly reactivated 6th Infantry Division (Light) replaced the 172nd Infantry Brigade. The 6th Infantry Division, deactivated in Korea following distinguished service in two world wars, was recalled as a specialized arctic/mountain light contingency force under U.S. Army Pacific. Headquarters was established at Fort Richardson and remained there until 1990 when it was transferred to Fort Wainwright (Higginbotham/Briggs & Associates 1991). Following deactivation of Headquarters, 1st Brigade, 6th Infantry Division (Light) in 1994, Headquarters USARAK became an active component at Fort Richardson. The major unit at Fort Wainwright became the 1st Brigade, 6th Infantry Division (Light). The Arctic Support Brigade, headquartered at Fort Richardson, also had units at Fort Wainwright (USARAK 1995). In 1998, the 6th Infantry Division (Light) was deactivated, and the 172nd Infantry Brigade (Separate) was activated. In 2004 the 172nd Infantry Brigade was converted to a Stryker Brigade Combat Team.

Donnelly Training Area, formerly known as Fort Greely, originated as Station 17, Alaskan Wing, Air Transport Command, later known as Allen Army Airfield in 1942. In 1949, the installation became the site of the Arctic Training Center (Headquarters, U.S. Army Pacific 1996), because of its extreme winter conditions in interior Alaska and varied terrain, including rivers, lakes, swamps, and open plains. The post was designated as Fort Greely on 6 August 1955. Fort Greely became part of the 172nd Infantry Brigade in 1974, when U.S. Army Alaska was restructured. Fort Greely was realigned as part of the Base Realignment and Closure process of 1995. Some 624,000 acres, which included testing ranges, firing ranges, maneuver training areas, and other training facilities were initially transferred to Fort Richardson, but within a year were transferred to Fort Wainwright and would become known as Donnelly Training Area. Three outlying training areas, Gerstle River, Black Rapids, and Whistler Creek Training Areas, which were also part of Fort Greely, were also transferred to Fort Wainwright.

2.1.4 Historic Natural Resources Program Development

Early efforts at natural resources management involved continuing programs initiated by the Air Force. By 1970, when the first natural resources professional was hired, the installation had developed two natural resources plans (USARAK 1970). In 1978, natural resources specialists from the three installations collaborated to draft a Natural Resources Conservation Program (Quirk et al. 1978). The first natural resources management plan specifically for Fort Wainwright was completed in 1981 (USARAK 1981). At that time, the Fort Wainwright program did not have an installation-specific cooperative plan and was still operating under a cooperative agreement between the 172nd Infantry Brigade, USFWS, and ADF&G.

Two *Proposed Resource Management Plans/Final Environmental Impact Statements* were written to fulfill the mandate of the Military Lands Withdrawal Act of 1986. One was specific to Fort Wainwright's Yukon Maneuver Area (BLM 1994b), and the other applied to the Fort Greely Maneuver Area and Air Drop Zone (BLM 1994a) now known as Donnelly Training Area East and West. These documents were the result of work by a joint BLM-Army planning team that consulted with the public throughout the process. The plans proposed a variety of nonmilitary uses while recognizing the primary military purpose of the withdrawn lands. The 1998 Fort Wainwright (Fort Wainwright 1998) and Fort Greely (Fort Greely 1998) INRMPs used the 1994 *Proposed Resource Management Plans/Final Environmental Impact Statements* as a base on which proposed management activities are built.

The 1998 Fort Wainwright and Fort Greely INRMPs were the first INRMPs developed and implemented under the new requirements of the 1997 Sikes Act Amendments. The 2002 Fort Wainwright (Fort

Wainwright 2002) and Fort Greely INRMPs (Fort Greely 2002) revised the 1998 INRMPs. When the INRMP was revised again in 2007 (USAGAK 2007), it was re-written to combine all of Army-managed lands in Alaska. In 2010, Fort Richardson combined with Elmendorf Air Force Base under the Base Realignment and Closure process of 2005 to become Joint Base Elmendorf-Richardson. The Joint Base is now responsible for the natural resources management on the former Fort Richardson lands.

2.2 U.S. Army Mission in Alaska

The United States Army must maintain its capability to put overwhelming land combat power on future battlefields and defeat potential enemies. Decisive victories depend on the Army's ability to rapidly deploy, fight, self-sustain, and win quickly with minimum casualties. As the Department of Defense's premiere land force, the Army relies on land to achieve its training and testing objectives and maintain force readiness. Force readiness depends on high quality, realistic training. The Army must train as it will fight. Realistic training areas and ranges are required to fully train Soldiers. A Soldier does not fire his/her weapon alone in battle. The Soldier's entire squad, platoon, company, and even battalion must coordinate their efforts to prevent any friendly fire accidents. This skill must be practiced on large-scale training areas and ranges that realistically portray a combat environment before going to war.

To accomplish this goal, the Army has separated garrison installation management and support functions from the warfighter, allowing the warfighter to focus entirely on the training mission. In Alaska, the Army warfighter component, USARAK, contains the units and Soldiers that train, deploy, fight, self-sustain, and win. The Stryker Brigade Combat Team, Airborne Brigade Combat Team, and Combat Aviation Brigade comprise a large portion of USARAK. Because of the relationship between accomplishing the training mission and range support operations, the installation range office has moved back within the USARAK structure, and is currently managed within the USARAK Training Support Systems (G-3) office. Other installation support operations, such as logistics, public works, and environmental are now known as U.S. Army Garrison Fort Wainwright.

2.2.1 USARAK Mission

USARAK's mission is to execute continuous training and readiness oversight responsibilities for Army Force Generation in Alaska, support U.S. Pacific Command Theater Security Cooperation Program, and on order, execute Joint Force Land Component Command functions in support of Homeland Defense and Security in Alaska. USARAK faces several challenges in accomplishing its mission. One of these is ensuring that training facilities are capable of supporting all required training events while integrating environmental stewardship into daily operations. As these critical challenges are met, USARAK also must continue to maintain a positive rapport with local communities.

USARAK has four major subordinate commands, the 1/25th Stryker Brigade Combat Team, 4/25th Airborne Brigade Combat Team, 2d Engineer Brigade, and the 16th Combat Aviation Brigade. Their missions are as follows:

- 1/25th Stryker Brigade Combat Team – On order, the Arctic Wolves Brigade deploys rapidly to a designated contingency area of operation by air and conducts operations either as a separate Brigade Combat Team or under the control of a contingency force headquarters.
- 4/25th Airborne Brigade Combat Team – Reset and retrain an Airborne Brigade Combat Team that is capable of conducting forced entry and full spectrum combat operations anywhere in the world.
- 2d Engineer Brigade – Trains and deploys modular, maneuver support, and combat service support units to any contingency. On order, the Brigade Headquarters deploys and executes

command and control of attached forces in order to provide full-spectrum maneuver support to Army, joint, and interagency operations.

- 16th Combat Aviation Brigade – Provides aviation forces to support Army Force Generation. On order, deploys worldwide to find, fix, and destroy enemy forces and sustain combat power in support of joint military operations to increase the lethality and agility of the ground force.

USARAK has two schools, the Noncommissioned Officers Academy at Joint Base Elmendorf–Richardson and the Northern Warfare Training Center at Fort Wainwright. Courses taught at the schools are as follows:

- NCOA - Warrior Leaders Course
- NWTC - Cold Weather Orientation Course, Cold Weather Leaders Course, Assault Climbers Course, and Basic Mountaineering Course

USARAK also provides support for the following major activities:

- 673rd Air Base Wing, Joint Base Elmendorf-Richardson
- 354th Fighter Wing, Eielson Air Force Base
- Alaska Army National Guard
- Alaska Air National Guard
- U.S. Reserve Forces
- Joint and Coalition forces
- U.S. Coast Guard
- Cold Regions Test Center

2.2.2 U.S. Army Garrison Fort Wainwright Mission

The USAG FWA mission is to provide premier installation services and support that enhance the readiness of our Military, Families, and Civilians wherever they serve.

USAG FWA is obligated to provide the best training for our military forces so that they will be ready to defend our nation in times of crisis. USAG FWA mission objectives are to (1) plan and execute deployment support, force protection, and contingency operations; (2) plan and execute transformation of the installation that supports Stryker and other mission units; (3) provide quality installation support and service to our customers; (4) provide proper stewardship of all resources and the environment; (5) sustain strong community relations; and (6) provide for the well being of the Army Family into the 21st century. For generations, Alaska has looked to the Army as the leader in both training and environmental management. USAG FWA will continue this mission without compromise.

2.2.3 Relationships between Natural Resources and the Military Mission

In many respects, USARAK's mission is highly dependent on natural resources, but at the same time it is moderately taxing on some of those resources. The Army's Integrated Training Area Management program mitigates some damage caused by this mission and other programs within this INRMP will prevent or reduce future damage. Pending no further land or resource losses, it is anticipated that Fort Wainwright will continue to provide a sufficient arena for current and future mission requirements.

2.2.3.1 Army Training in Alaska

Army training includes home station training (in Alaska), national combat training center rotations (outside Alaska), joint training exercises, and operational deployments in support of national directives. Home station training and joint training exercises impact natural resources in Alaska. In general, squad, platoon, and some company training events would be conducted at Fort Wainwright, and remaining company, battalion, and brigade training events would be conducted at Donnelly Training Area. Unit training events are defined by a basic event type (e.g., command post exercise), the size of the unit (e.g., battalion, company), and the type of unit (e.g., infantry, engineer). Basic unit training events include individual weapons qualification, common military training, crew weapons qualification, crew weapons sustainment, command post exercise, command field exercise, situational training exercise, fire coordination exercise, field training exercise, live-fire exercise, tactical exercise without troops, and map exercise. Each of these training events requires different range or training assets and has a different impact on training lands. Activities associated with these events have been analyzed in the *Final Legislative Environmental Impact Statement for Alaska Army Lands Withdrawal Renewal, Vol. 1-2* (USARAK 1999), the *Final Environmental Impact Statement for Transformation of U.S. Army Alaska, Vol. 1-2* (USARAK 2004), the *Final Environmental Impact Statement for the Construction and Operation of a Battle Area Complex and a Combined Arms Collective Training Facility within U.S. Army Training Lands in Alaska* (USARAK 2006), and the *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* (USARAK 2009).

2.2.3.2 Impacts of Army Training on Natural Resources

2.1.3.2.1 Past Impacts

Fort Wainwright lands were all withdrawn during or since World War II. Military use has changed the landscape from its original, pristine condition through construction and weapons and maneuver training. Consultation with Alaska Native tribes and other groups have indicated concern that past military training, testing, construction, or operation activities may have resulted in the potential release of munitions constituents or contaminants that may have affected water quality and wildlife resources. While military use has degraded pristine habitats from the original condition before World War II, the withdrawal of land for military use has also had a long-term positive effect on natural resources, as the areas likely would have otherwise been enveloped by the expansion of Fairbanks, North Pole, and Delta Junction. Most of the land outside of the Main Post cantonment area remains undeveloped, affected only by training impacts. In 1970, Fort Wainwright adopted a policy of actively conserving natural resources. Proactive natural resources conservation programs since then have mitigated impacts from military training and have resulted in positive impacts on natural resources.

2.2.3.2.2 Present Impacts

Military training can be separated into two broad categories that can cause impacts to natural resources: maneuver training and (live-fire) weapons training. While these two activities can be conducted at the same time (especially on the new Battle Area Complex and Multi-Purpose Training Ranges), maneuver generally occurs in training areas and weapons training occurs on live-fire ranges and impact areas.

Maneuver training is conducted primarily in training areas, a space for ground and air combat forces to practice movements and tactics. Each training area is managed and scheduled by Range Control. Different unit types may work in support of one another (combined arms), or the unit may operate on its own to practice a specific set of tasks. Included in these training areas are bivouac sites, maneuver areas, roads, trails, base camps, drop zones, landing zones, observation points, and other miscellaneous training sites. Primary impacts to soils, vegetation, and wetlands occur from driving vehicles on and off-road. Localized impacts can occur in bivouacs, base camps, and assembly areas from digging, vegetation damage, spills, and trash. These activities also carry the minor risk of the potential for hazardous waste spills or fire starts. These activities can cause erosion, road degradation, creation of new trails, and long-term habitat change.

Live-fire weapons training also has land-based requirements. Direct fire weapons training occurs primarily on firing ranges; indirect fire weapons training occurs on mortar or artillery firing points and munitions from firing ranges land in surface danger zones or impact areas. A live-fire operation is defined as a training event that uses service (or real) ammunition as opposed to blank ammunition. A direct fire operation occurs when ammunition is delivered on target by sighting directly on the target using the weapon system's sighting equipment. During a direct live-fire event, Soldiers maintain an unimpeded direct line-of-sight between their location and the targets, while shooting real bullets at those targets. Indirect fire means that weapons are fired up in the air at a trajectory. Soldiers do not maintain an unimpeded direct line-of-sight between their location and targets, but rather track munitions through a forward observer or other technological means. Live-fire ranges are maintained and targets replaced on a regular basis to provide realistic training. While some impacts occur on range berms and target locations, most impacts on the environment occur in impact areas. Impacts to soils, water, and vegetation from live-fire weapons training include cratering, target scrap, munitions residues, the potential for unexploded ordnance, and fire starts.

U.S. Army Garrison Fort Wainwright is conducting soil and water quality monitoring in impact areas to identify and detect if any munitions residues are moving out of impact areas. Preliminary data from these studies suggests that munitions residues are not moving out of impact areas through surface water, groundwater, wind-blown soils, or wildlife.

The Army recognizes that training to doctrinal standards under realistic combat conditions will affect the environment. Providing premiere and realistic training opportunities requires training lands to be in good environmental condition. It is in overcoming the apparent conflict between force readiness and environmental stewardship that the Integrated Training Area Management program serves the overall needs of the Army. The Integrated Training Area Management program essentially acts as an ongoing mitigation program for Army maneuver training activities. It is the Army's formal strategy for focusing on sustained use of training lands, and it provides the Army with the sound planning and execution mandatory to protect Army land as an essential asset for training. The integration of stewardship principles into training land and conservation management practices ensures that the Army's lands remain viable to support future training and mission requirements.

As part of the Integrated Training Area Management program, U.S. Army Garrison Fort Wainwright has developed a hierarchical classification system (termed environmental limitations overlays) for use with existing military installation maps to inform Soldiers and units where, when, and how military operations can be conducted. These classifications are applicable to all Army training lands in Alaska and are used by military units and Range Control when making scheduling decisions. These overlays serve as the primary guide in regulating and minimizing surface disturbance from maneuver and general military training in the field.

There are also positive effects of the military mission on natural resources. The USARAK military mission fosters relatively healthy, stable ecosystems. The most basic and significant reason for this is found in the very nature of the infantry's use of the land. While infantry-related exercises may cause localized damage, they very seldom threaten ecosystems or biodiversity. Also extremely important is U.S. Army Garrison Fort Wainwright's commitment to natural resources management, including minimizing and mitigating military mission damage. This commitment is beneficial for both natural resources in general and people who use them. Instead of conflict with the mission, natural resources management emphasizes the accomplishment of multiple objectives for both natural resources management and military training. Habitat enhancement areas—especially those for species that depend on primary successional vegetation such as moose, bison or grouse—are often used as bivouac areas for training.

Conversely, training exercises can be used as a tool to accomplish natural resources management objectives.

2.2.3.2.3 Future Impacts

USARAK's mobilization mission is expected to change over the next five-year period as units experience longer home-station dwell times. The demands on ranges and training areas will increase as new and more lethal weapons systems with greater engagement ranges are developed and fielded. These demands will require more effective range and training land management practices. Training facility managers will have to consider redesigning or renovating / relocating existing ranges and training lands to meet the increased demand. More reliance will be placed on Training Aids, Devices, Simulators, and Simulations for many of the familiarization and sustainment training needs of selected weapons systems. Because of this, opportunities to perform live-fire training tables must be maximized and live-fire training facilities must become more effective and efficient. This will place more emphasis on modernizing or renovating direct fire range facilities to accurately account for rounds fired and hits scored and to provide flexible and programmable scenario-driven target presentations.

Impacts of the continuing withdrawal of land for military purposes are addressed in the *Final Legislative Environmental Impact Statement for Alaska Army Lands Withdrawal Renewal, Vol. 1-2* (USARAK 1999). Impacts of current and future military activities on Army lands are addressed in the *Final Environmental Impact Statement for Transformation of U.S. Army Alaska, Vols. 1 and 2* (USARAK 2004). Activities at Donnelly Training Area are further analyzed in the *Final Environmental Impact Statement for the Construction and Operation of a Battle Area Complex and a Combined Arms Collective Training Facility within U.S. Army Training Lands in Alaska* (USARAK 2006a). The *Environmental Assessment and Finding of No Significant Impact for Conversion of the Airborne Task Force to an Airborne Brigade Combat Team* covers additional changes (USARAK 2005a). Most recently in 2009, USARAK completed the *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement* to evaluate the environmental effects of the Army proposal to station and train a new aviation unit in Alaska. These respective NEPA documents address the regular, ongoing impacts of USARAK's mission. The impacts of the maneuver missions were modeled using the Army's Training and Testing Area Carrying Capacity methodology (USARAK 2004). Future impacts to natural resources as a result of a mission changes that are not covered under current planning documents will be addressed by separate NEPA documentation. Natural resources management is a requirement to comply with multiple laws. All of these NEPA documents require natural resources management as mitigation for military impacts. This is in addition to Sikes Act requirements for natural resources management on all military lands.

2.2.3.3 Impacts of Natural Resources on Army Training

Natural resources on Fort Wainwright impact the Army's training mission both from a regulatory and compliance standpoint and based upon the physical structure and functions on the landscape. Regulatory limitations involve restrictions on land use and construction as a result of federal and state laws, executive orders, and Army policy. Major drivers include the Clean Water Act; Migratory Bird Treaty Act; Endangered Species Act; Sikes Act; and Comprehensive Environmental Response, Compensation, and Liabilities Act sites. Physical structures and functions that impact training include: wetlands, adverse terrain, soil conditions, dense vegetation, wildland fire, and wildlife interactions. All these factors can be incorporated into an environmental limitation overly to communicate limitations to units and Soldiers.

Several physical resource conditions existing at Fort Wainwright may present potential environmental issues or constraints for existing or potential training requirements. These conditions include wetlands, terrain, poorly developed soils, vegetation, wildland fire, and wildlife resources. Most limitations involve wetlands protected by executive order, federal and state laws, and Army policies, but also include

limitations resulting from Migratory Bird Treaty Act vegetation clearing guidelines, outdoor recreation, wildlife calving, and Superfund clean-up sites. All these factors are included into the environmental limitations overlay, which communicates these limitations to units and Soldiers.

Wetlands encompass a majority of all training lands and pose both physical and regulatory constraints to training. Collectively, U.S. Army Garrison Fort Wainwright has successfully mitigated these constraints by obtaining regulatory permits in advance of field training exercises / construction activities and directing units to alternative upland training locations during the summer. While not directly related to specific training events, wetlands continue to pose significant issues and costs for range maintenance, upgrades, and new construction projects that support the training mission.

Terrain poses a physical constraint to maneuver training and range construction activities. Excessive slope limits trafficability and poses challenges for range construction.

Poorly developed soils and permafrost soils impact both maneuver training and limit options for range construction. Permafrost initially stabilizes soils but can degrade, resulting in saturated soil conditions and / or subsidence that impact both maneuver and range construction. Poorly developed soils are relatively unproductive and once degraded are prone to rutting and erosion. Rehabilitation efforts can be costly with limited resources resulting in areas being unavailable for training.

Vegetation constitutes a physical barrier to maneuver throughout most of the training lands. Continual maintenance is required to remove woody vegetation from drop zones, landing zones, firing ranges, and maneuver areas. Vegetation clearing guidelines designed to protect migratory birds provide an additional regulatory constraint on range maintenance and construction activities.

High fire danger imposes a number of restrictions on live-fire training throughout the summer. Severely dry conditions coupled with high winds and high fuel loading in some locations increases the risk of wildland fire. During high and extreme fire danger, the use of pyrotechnics is restricted. These risks are reduced through an active fuel reduction program.

Since no threatened or endangered species exist within Fort Wainwright maneuver and training lands, there are no wildlife impacts on training due to compliance with the Endangered Species Act. Training activities can be restricted through compliance with other laws such as the Bald and Golden Eagle Protection Act, through agreements detailed later in this document and through mitigations agreed to in NEPA documents. Many of these restrictions apply only if the wildlife species of concern is present or during certain times of year or at specific locations. Historically, these restrictions have had only a minimal impact on training. Specific wildlife limitations are detailed in *Memorandum of Agreement between U.S. Army Garrison Fort Wainwright and United States Department of Interior, U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.*

CHAPTER 3. MANAGEMENT STRATEGY AND SUSTAINABILITY

3.1 Ecosystem Management

Fort Wainwright's natural resources program has traditionally been based on multiple use management philosophies. Military training, however, is the primary land use. This philosophy will continue through into the future, with one important addition – maintaining functional ecosystems is now the goal of land and natural resources management programs. "Realistic training lands" are often quoted as essential needs by military trainers. For training to be realistic, the military must train in non-degraded ecosystems with natural vegetation and terrain features. Such ecosystems must also be maintained for the long-term because the acquisition of new training lands is difficult at best. This means that functional ecosystems on Army lands must be sustained indefinitely. Thus the future of USAG-FWA and the USARAK military mission, as well as the local communities that depend upon the Fort Wainwright lands, relies on maintaining functional ecosystems.

3.1.1 Introduction

The Department of Defense has endorsed ecosystem management nationwide. The Department of Defense goal with regard to ecosystem management is: "To follow an ecosystem-based management approach to natural resources-related practices and decisions, using scientifically sound conservation procedures, techniques, and data." Ecosystem management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance with environmental laws, quality of life, and integration. The specific ecosystem management goals and objectives for Fort Wainwright are listed below:

- Provide an indicator of ecosystem integrity, status of sensitive species or communities, and other special interests.
- Implement an adaptive management strategy by providing current and predictive natural resources information that will affect land use decision-making.
- Pinpoint areas where management could positively affect ecosystems.
- Protect and conserve all biological communities, including game and nongame species.
- Ensure that Fort Wainwright's natural resources program is coordinated with other agencies and conservation organizations with similar interests.
- Sustain natural landscapes required for the training and testing necessary to maintain military readiness.
- Provide the greatest return on Department of Defense's investment to preserve and protect the environment.
- Expedite the environmental compliance process and help avoid conflicts.
- Engender public support for the military mission.
- Improve the quality of life for military personnel.

Objectives and guidelines for achieving these goals are listed below:

- Develop a vision of ecosystem health.
- Develop priorities and reconcile conflicts in land use decisions.
- Maintain and improve the sustainability and native diversity of ecosystems.
- Administer with consideration of ecological units and evolutionary time frames.
- Support sustainable human activities.

- Develop and implement coordinated approaches to work toward ecosystem health.
- Use benchmarks to monitor and evaluate outcomes.
- Implement through installation plans and programs.
- Support the military mission.
- Use joint planning between natural resources managers and military operations personnel.
- Integrate conservation of ecosystem integrity into Integrated Natural Resources Management Plan, Integrated Training Area Management, and other planning protocols.
- Involve internal and external stakeholders up front.
- Emphasize the regional (ecosystem) context.
- Involve scientists and use the best science available.
- Concentrate on results.

3.1.2 Current Management

As stated above, the goal of the ecosystem management program is to maintain ecosystem integrity while continuing to train Soldiers to a high level of military readiness. Ecosystem integrity, sometimes referred to as biodiversity, includes the concept of biological diversity as well as the ecological and evolutionary processes that contribute to the maintenance of functioning ecosystems and the production of biological diversity itself. Ecosystem integrity also encompasses several levels and geographic scales in the hierarchy of life, including ecosystem diversity, community diversity, species diversity, and genetic diversity (Noss and Cooperrider 1994). Fort Wainwright is using an ecosystem management process to maintain ecosystem integrity by managing for a large number of species simultaneously, managing for a variety of habitats and structural vegetation types, and striving to maintain natural processes on the landscape.

The Department of Defense is developing a policy for the management of ecosystem integrity that will use the Integrated Natural Resources Management Plan (INRMP) process as the implementation tool. A first step in this process was the preparation of *A Department of Defense Biodiversity Management Strategy* (The Keystone Center 1996). In that report, the authors note that the challenge is "*to manage for biodiversity in a way that supports the military mission."* The Keystone Center strategy identifies the INRMP as the primary vehicle to implement protection of ecosystem integrity on military installations.

Conservation of ecosystem integrity is a large commitment, and ecosystem management is increasingly recognized as an important means to achieve this commitment. Although ecosystem management is not mandated by law, its implementation is a proactive approach that will help in the process of complying with existing environmental laws such as the Endangered Species Act, Sikes Act, Clean Water Act, and National Environmental Policy Act.

3.1.3 Proposed Management

Fort Wainwright will continue to implement the ecosystem management process as a foundation and integrator for all other management programs. The procedures for implementing ecosystem management are found in Appendix G of this document. Fort Wainwright has developed a number of proposed ecosystem management prescriptions for each ecosystem management unit found in Chapter 4.

3.2 Watershed and Wetlands Management

Fort Wainwright's watershed and wetland management program encompasses soil, vegetation, and water resources, the foundations for forestry, wildlife, fish and wildlife, outdoor recreation, and rare, threatened and endangered species programs. Watershed and wetlands management goals and objectives all

contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Army Regulation 200-1 (2009) and DoDI 4715.03 (2008) establish the following objectives for soil, vegetation, and water resources on Army lands:

- Conserve all soil, vegetation, and water resources.
- No net loss of wetlands.
- Ensure that Fort Wainwright is in compliance with all applicable federal and state laws and regulations regarding wetlands.
- Provide wetland areas for realistic military training, while maintaining ecosystem integrity and minimizing impacts to wetlands.
- Distribute wetland management prescriptions to all user groups: military, recreationalists, Directorate of Public Works, and Alaska Fire Service.
- Promote early coordination between installation staff and the Environmental Resources Department to prevent adverse impacts to wetlands.
- Control or eliminate sources of pollution to surface water or groundwater through conventional or innovative treatment systems.
- Demonstrate leadership in attaining the national goal of zero discharge of water pollutants.
- Provide drinking water that meets applicable standards.
- Cooperate with federal, state, and local regulatory authorities in forming and implementing water pollution control plans.
- Control or eliminate runoff and erosion through sound vegetative and land management practices.

Fort Wainwright will continue to implement the watershed and wetlands management program. A much more detailed management component plan is found in Appendix B. Future projects to be completed are also found in Chapter 4. The procedures for implementing watershed and wetlands management are found in Appendix G. Site-specific goals, objectives, and projects are found in Chapter 4.

3.2.1 Soil Resources Management

Soil resources management on Fort Wainwright lands entails the conservation of soils. Fort Wainwright practices soil conservation through survey, monitoring, rehabilitation, and effective management strategies, which are described below. More details on soil resources management can be found in Appendix B, Section B2.1.

3.2.1.1 Soil Resources Inventory and Monitoring

Fort Wainwright conducts planning level soil surveys and soil resource monitoring. The first program, planning level surveys, inventories topography and soil resources across the installation. The Integrated Training Area Management program conducts annual monitoring of soils and vegetation through the Range and Training Land Assessment program.

3.2.1.1.1 Soil Planning Level Survey

Development of a multiple use natural resources management program requires an inventory and classification of the resources present. The Fiscal Year 2010-17 Army Environmental Funding Guidance (2010) requires installations to identify and evaluate the condition of soil resources. Soil planning level surveys (PLSs) produce or update maps of the approximate location, classification, and distribution of soils on an installation. NRCS soil surveys do not exist for over 750,000 acres of installation and need to be field-truthed for remaining 850,000 acres. Fort Wainwright's PLSs identify and map soils, correlate soils to permafrost areas, and establish relationships among terrain features. Soil surveys are essential for

effective management of withdrawn public lands, and soil data are required for input into the military training and scheduling process.

3.2.1.1.2 Topographical Planning Level Survey

Fort Wainwright updates topographical planning level surveys every ten years. An accurate topographical planning level survey is required by Army Regulation 200-1 and is required to implement this INRMP as mandated by Public Law 86-797 (Sikes Act).

3.2.1.1.3 Soil Monitoring

Soil monitoring is conducted through the Range and Training Land Assessment program, the monitoring component of the Integrated Training Area Management program. Current and past disturbance resulting from military training and recreational use is delineated and quantified in terms of "land condition." Annual Range and Training Land Assessment reports detail the levels of disturbance and land condition on Forts Richardson and Wainwright.

3.2.1.2 Soil Resources Rehabilitation and Management

Soil resources management consists primarily of prevention activities and actual restoration of disturbed areas. The Integrated Training Area Management Five Year Management Plan and this INRMP (Appendix G) contain best management practices, which are in concert with installation storm water prevention techniques. Restoration of disturbed areas is conducted by erosion control and streambank stabilization programs, as well as the mission-related Land Rehabilitation and Maintenance program.

3.2.1.2.1 Erosion Control and Streambank Stabilization

Installation sources of dust, runoff, sediment, and debris are controlled to prevent damage to land, water and air resources, equipment, and facilities, including those on adjacent properties. A protective vegetative cover is maintained over all compatible areas. Fort Wainwright uses bio-engineered erosion control practices when possible, including live plantings, root wads, coir logs, and spruce tree revetments, to provide erosion protection and habitat for fish and wildlife. Other materials that are used for erosion control include gravel, fabrics, mulch, riprap, and other materials that are environmentally safe and compatible with the site and approved by the Alaska Department of Natural Resources, Office of Habitat Management and Permitting. When bare ground is required to accomplish mission objectives, other soil conservation measures are used to control dust, erosion, and sedimentation.

3.2.1.2.2 Land Rehabilitation and Maintenance

Land rehabilitation and maintenance consists of strategies and resource allocations for resting and repairing the soils on training lands on a rotational basis as well as repairing other problem erosion areas as the need arises. Land rehabilitation and maintenance includes programming, planning, designing, and executing land rehabilitation and maintenance projects based on requirements and priorities identified by the Training Requirements Integration and Range and Training Land Assessment components of the Integrated Training Area Management program.

3.2.1.2.3 Agriculture/Grazing Outlease

Leasing of land for uses that are compatible with mission requirements can reduce installation maintenance efforts, provide opportunities for accomplishing land maintenance by the lessee at no cost to the installation, provide funds which the Army can use to support leasing efforts and other natural resources requirements, and support community relations and the local economy. While there currently are no outleases on Fort Wainwright lands, Fort Wainwright will continue to search for opportunities that could contribute to soil resources management.

3.2.2 Water Resources Management

Water resource management goals and objectives contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and program integration. Surface water management protects creek sides, streambanks, lake shores, and sensitive areas adjacent to surface waters. Groundwater management consists of restoration projects to resolve individual sources of pollution. These projects are not classified as natural resources management and are not included within this INRMP. More details on water resources management can be found in Appendix B, Section B2.2.

3.2.2.1 Water Resources Inventory and Monitoring

Fort Wainwright water resources inventory is accomplished by conducting planning level surface water surveys and annual surface water and groundwater monitoring. Planning level surveys delineate the extent of surface water within the installation. Surface water monitoring monitors the quality of water in surface water bodies surrounding impact areas and groundwater monitoring monitors the quality of water in ground water wells. Groundwater monitoring responsibilities are not part of Fort Wainwright's natural resources program but rather the responsibility of its compliance program. A brief summary of groundwater monitoring is provided below to demonstrate its importance as an environmental compliance activity.

3.2.2.1.1 Surface Water Planning Level Survey

Fort Wainwright's surface water planning level surveys delineate the extent of surface water across the installation's 1.6 million acres. Shifts in waterlines driven by glacially fed riverine systems and desiccation of ponds and lakes from long-term drought result in constantly changing surface water boundaries. Fort Wainwright maintains and updates a "fence line to fence line" surface water planning-level survey at a minimum of once every ten years.

3.2.2.1.2 Surface Water Monitoring

Water quality monitoring is an important tool for measuring ecosystem health. Surface water monitoring is conducted to evaluate the presence of munitions residues from impact areas and evaluates the quality of water entering and leaving Fort Wainwright. Fort Wainwright has developed monitoring protocols to evaluating soil and water quality in training areas where concentrations of heavy metals and munitions residues are potentially high. Surface water sampling locations are located in areas where rivers and creeks enter and leave the installation. Soils are also sampled in rivers and creeks near the edges of the impact areas. Water quality monitoring is necessary for compliance with the Clean Water Act and other environmental laws and regulations and for formulating options for managing species that are highly dependent upon high water quality, as required by the Sikes Act and Army Regulation 200-1.

3.2.2.1.3 Groundwater Monitoring

Fort Wainwright's compliance program oversees groundwater monitoring. The need for groundwater monitoring became evident after Fort Wainwright was placed on the National Priorities List in 1994. Fort Wainwright is committed to monitoring groundwater and has installed approximately 100 monitoring wells. Groundwater levels in monitoring wells are inspected on a monthly basis, and groundwater samples undergo extensive chemical testing on a quarterly basis. This program is important to natural resources management but is not considered a natural resources function. Details of this program are not included within this INRMP but can be found by contacting Fort Wainwright Environmental office.

3.2.2.2 Water Resources Management

Managing the installation's water quality requires implementation of storm water pollution prevention plans and best management practices designed to protect and preserve water quality. Water quality management is necessary for compliance with Section 402 of the Clean Water Act and the Sikes Act, the latter which requires "no net loss" in the capability to support the military mission of Fort Wainwright. Water resources management actions at Fort Wainwright are centered around storm water planning and management, erosion control, best management practices, and impact area management.

3.2.2.2.1 Storm Water Pollution Prevention Plan

Storm water is generated when water from rain and snowmelt flows over land and does not infiltrate into the ground. As the runoff flows over impervious surfaces, such as paved roads, sidewalks, parking lots, and soils compacted by urban development, it accumulates debris, chemicals, sediments, and other pollutants that can adversely affect water quality if the runoff enters waterbodies untreated. To control storm water discharges, Fort Wainwright employs a number of best management practices, many which are required by the Alaska Department of Environmental Conservation's Division of Water. Operators of construction projects disturbing one or more acres of land must obtain an Alaska Construction General Permit, which requires the preparation and implementation of a storm water pollution prevention plan. As an industrial facility, Fort Wainwright has also obtained a Multi-Sector General Permit, under which Fort Wainwright is required to maintain storm water control measures to minimize pollutants in storm water runoff and follow an installation-wide storm water pollution prevention plan. The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 ft2 shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

3.2.2.2.2 Erosion Control Best Management Practices

Fort Wainwright employs a set of best management practices for erosion control. These best management practices help to ensure that sediment and other contaminants do not enter wetlands or other waters of the U.S. These best management practices are all listed in the Range Complex and Training Land Upgrades Programmatic Range Environmental Assessment (USAGAK 2010) as well as in Appendix G of this INRMP.

3.2.2.2.3 Impact Area Management

In impact areas, managing water quality requires implementation of best management practices designed to reduce potential release from expended munitions. Activities such as locating targets away from open water and wetlands are used to reduce the likelihood that potential releases may occur.

Fort Wainwright recognizes that release of contaminants into the environment and response actions necessary for removing released contaminants may have adverse impacts to natural resources addressed in this INRMP. The Installation Restoration Program is responsible for identifying contaminant releases, considering risks and assessing impacts to the environment (including impacts to endangered species, migratory birds and biotic communities), and developing and selecting response actions when unacceptable risk to ecological receptors from a release is likely. The installation's natural resources management staff, in coordination with the USFWS and Alaska Department of Environmental Conservation will identify, when required, the potential impacts to natural resources caused by the release of contaminants and communicate those impacts to the Installation Restoration Program.

3.2.3 Vegetation Management

Vegetation management on Fort Wainwright lands entails the conservation of vegetation for military cover and concealment, wildlife habitat, timber, and erosion control. Fort Wainwright contributes to

vegetation conservation through surveys, monitoring, rehabilitation, and effective management strategies. More information on vegetation management can be found in Appendix B, Section B2.3.

3.2.3.1 Biodiversity

Most of the land was relatively undisturbed when it was withdrawn for military use. Because there are little or no data on most species prior to the last 20 years or so, it is unknown how the military presence has affected biodiversity on Fort Wainwright. Changes in ecosystems have been localized and may have affected species abundance for short periods, but probably have not affected overall species richness.

There is no evidence that Army use has affected any plant or animal species beyond specific sites of construction or military activity. Greatest losses of habitat are associated with the Main Post due to construction and associated urban development and use.

3.2.3.2 Vegetation Inventory and Monitoring

Vegetation inventory efforts are accomplished by conducting comprehensive "fence line-to-fence line" flora and vegetation community planning level surveys. Vegetation monitoring is accomplished through the Ecosystem Management program.

3.2.3.2.1 Flora Planning Level Survey

Fort Wainwright conducts a baseline floristic survey to identify all vegetative species that occur on all Fort Wainwright lands. This survey is updated at least once every ten years to determine trends in floristic biodiversity and to improve the quality of the floristic database. Floristic inventory activities set the foundation on which many decisions regarding land management are based.

3.2.3.2.2 Vegetation Communities Planning Level Surveys

Fort Wainwright also conducts a vegetation community survey for all of its lands. This survey is also updated at least once every ten years. Vegetation surveys are conducted as part of an ecological land classification that synthesizes results from integrated resources studies to map ecologically sensitive portions of the landscape to facilitate land management and minimize impacts to ecosystems. The project is designed to emphasize three aspects of ecosystem management: the sensitivity and recovery of ecosystems to disturbance, permafrost distribution and relative stability, and the value of wildlife habitats. The identification of ecologically sensitive areas and threats to these areas are critical to management of the entire installation.

3.2.3.2.3 Vegetation Inventory Monitoring

Vegetation monitoring is conducted through the Ecosystem Management program and the monitoring component of the Integrated Training Area Management program. Current and past disturbance to vegetation resulting from military training and recreational use is delineated and quantified in terms of "land condition." The Annual Range and Training Land Assessment reports detail the levels of disturbance and land condition on Fort Wainwright lands.

3.2.3.3 Vegetation Management

All five of the Integrated Training Area Management components support vegetation management. Range and Training Land Assessment monitors vegetation condition, Land Rehabilitation and Maintenance repairs and revegetates disturbed areas, Training Requirements Integration schedules training on areas that can support that training, and Sustainable Range Awareness minimizes vegetation damage through soldier education. Geographical Information System displays and maintains data, including vegetation

information. The Integrated Training Area Management program is described in more detail below in Section 3.2.9.

Vegetation is also managed through the Fort Wainwright forestry and fish and wildlife programs. Hand thinning, mechanical methods, and prescribed fire are all used to improve wildlife habitat, reduce hazard fuels, conduct timber stand improvement, improve accessibility and maneuverability, and maintain overhead cover. Other programs also affect vegetation. Both range maintenance and roads and grounds maintenance control vegetation to maintain roads, maintain ranges, increase accessibility to facilities, and improve sight lines to range targets.

3.2.4 Wetlands and Waterbody Management

Fort Wainwright's wetland and waterbody management program facilitates compliance with Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbor Act, and other environmental regulations. Wetlands are lands that support hydrophytic vegetation, hydric soil, and wetland hydrology. Waterbodies are areas permanently or seasonally covered with surface water (flowing or unflowing) that do not support vegetation due to the movement of flowing surface water or depth of unflowing surface water. Wetlands and waterbodies are important landscape features that provide numerous beneficial services to humans, fish, and wildlife. Examples of these services, or functions, include: provision of essential breeding, spawning, nesting, and wintering habitats for many of the nation's fish and wildlife species; protection and improvement of water quality by impeding erosive forces of moving water and trapping waterborne sediment and associated pollutants; maintaining base flow to surface waters through the gradual release of stored flood waters and groundwater; and providing a natural means of flood control and storm damage protection through the absorption and storage of water during high flow periods.

Wetland and waterbody management on Fort Wainwright lands is implemented on the primacy that completion of the military mission must comply with applicable laws and should not result in long-term damage to the environment. Training and testing that incorporates environmental stewardship make this possible and allow for the maintenance of a quality military training and testing environment, as well as protection of sensitive habitats, such as wetlands. More information on wetland and waterbody management can be found in Appendix B, Section B2.4.

3.2.4.1 Wetlands and Waterbody Inventory and Monitoring

Wetland and waterbody inventory and monitoring provide an indicator of ecosystem integrity, status of sensitive plant species and communities, and data required to comply with Section 404 of the Clean Water Act, executive orders, directives, and other regulations. Inventory and monitoring are important tools for identifying areas where improvements or rehabilitation are needed to maintain ecosystem integrity and support military training activities.

3.2.4.1.1 Wetlands and Waterbody Inventory

Wetland and waterbody inventories are required for management of withdrawn public lands. Fort Wainwright meets this requirement through the implementation of wetland and waterbody planning level surveys. Planning level surveys provide a broad-scale identification and characterization of wetlands and waterbodies over expansive areas. Characterization of wetlands and waterbodies follows Cowardin et al.'s (1979) Classification of wetlands and deepwater habitats in the United States, a nationally accepted hierarchical wetland and deepwater habitat classification system that imposes boundaries on natural aquatic ecosystems for the purposes on inventory, evaluation, and management. Fort Wainwright also refers to the USFWS's National Wetland Inventory (NWI), which inventories wetlands and waterbodies throughout the nation for conservation purposes. While the NWI is useful as a planning tool, the maps it

produces for Alaska tend to over-look small but nevertheless aquatic features and digital maps are currently only available for approximately 31% of the installation.

In addition to planning level surveys, smaller, site or project specific wetland and waterbody delineations are conducted on an annual basis. Wetland and waterbody delineations require field visits to determine the precise location of wetland, waterbody, and upland boundaries. Wetland delineations follow the technical guidance and procedures outlined in the USACE's Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (V 2.0). Completed delineations are submitted to the USACE for jurisdictional determination, a process for determining whether wetlands and other water bodies are federally regulated. Currently, wetlands adjacent to traditional navigable or interstate waters, wetlands that directly abut relatively permanent waters, and wetlands adjacent to jurisdictional tributaries to traditional navigable water or interstate waters are considered to be jurisdictional.

3.2.4.1.2 Wetland and Waterbody Monitoring

Wetlands and waterbody monitoring concentrates on areas that are used for maneuver training, such as military maneuvers, bivouac (camping) activities, and live-fire operations from permanent firing ranges. Almost all military training tasks involve a maneuver component that can take place on and off-road. The goal of wetland and waterbody monitoring is to quantify the extent and severity of disturbance to wetlands and waterbodies from military and civilian land use. The Range and Training Land Assessment component of the Integrated Training Area Management program monitors military and non-military use of wetlands. In addition to quantitative monitoring through the Range and Training Land Assessment, Fort Wainwright staff conducts qualitative assessments of wetlands use during large military training field exercises.

3.2.4.2 Wetland and Waterbody Management

The goal of wetland and waterbody management is to maintain or improve the current condition of the installation's wetlands and waterbodies. Fort Wainwright's approach to wetland and waterbody management is watershed-based, meaning it considers water resources as well as the surrounding land from which the water drains. Wetland and waterbody management is key to Fort Wainwright's ability to offer high-quality, realistic training opportunities across its landscape. Wetland and waterbody management at Fort Wainwright establishes a basis for conservation and protection of wetlands and waterbodies, and it facilitates the implementation of training activities by reducing the time required to obtain Clean Water Act Section 404 permits and Rivers and Harbor Act Section 10 permits. Various courses of action in support of wetland and waterbody management are described in Appendix G. They set specific procedures for management of military training, recreational use, facilities management, and fire prevention and suppression activities in wetlands and waterbodies.

3.2.4.2.1 Wetland and Waterbody Protection and Damage Prevention

Preventing environmental damage is more effective and less costly than attempting to restore degraded ecosystems. However, the most effective prevention measure – prohibition of land development and training activities – is generally not an option on military installations. Thus, a compromise between total protection of the environment and unrestricted military training must be reached.

Fort Wainwright follows wetland protection measures recommended by the USACE regulatory office, some which were required in a five-year Clean Water Act Section 404 permit issued to Fort Wainwright in 2000. The protection measures identify and restrict activities that are likely to damage wetlands, based on the time of year during which the activity will occur, the location of the activity (e.g., forest wetland versus stream), the degree of soil disturbance the activity will cause, the activity's direct and indirect affect on water quality, and the activity's potential to impact wildlife and fisheries.

Outdoor recreation can also impact wetlands (Racine et al. 1998 and Jorgenson et. al. 2007). These issues are addressed in Appendix E, Outdoor Recreation Management.

3.2.4.2.2 Wetland and Waterbody Regulations and Compliance

Permits for most construction activities in waters of the U.S., including wetlands, are required under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbor Act, and Army Regulation 200-1. Under EPA's approval and oversight, the U.S. Army Corps of Engineers' regulatory program evaluates permit applications for construction activities that occur in the nation's waters. Waters of the U.S. are loosely defined as rivers, streams, sloughs, lakes, ponds (all referred to as "waterbodies" elsewhere in this INRMP), and wetlands (see 40 CFR 230.3(s) for an official definition of waters of the U.S.). Section 404 of the Clean Water Act regulates the discharge of dredge material, fill material, or both in to waters of the U.S. Section 10 of the Rivers and Harbor Act regulates activities conducted below the ordinary high water mark of navigable waters of the U.S., such as structure placement or removal, dredging, disposal of dredged material, and modification of a navigable waterway.

Compensatory mitigation for losses of aquatic resources, such as wetlands and other waters of the U.S., is required under 33 CFR Parts 325 and 332. When permitted Army construction or training activities require unavoidable impacts to waters of the U.S., the Army must demonstrate how it has attempted to avoid and minimize impacts to wetlands and other waters of the U.S. When the impacts are considerable, the Army must offset the loss of wetland and aquatic resource functions in the watershed through compensatory mitigation, preferably within the same 6th-level watershed where the impacts will occur. Three mechanisms for compensatory mitigation are available: mitigation banking, in-lieu-fee mitigation, and permittee-responsible mitigation. Mitigation banking allows permittees, upon approval of regulatory agencies, to purchase credits from a mitigation bank, which is a wetland area that has been restored, established, enhanced, or preserved, to meet compensatory mitigation requirements. This type of mitigation is performed off-site, meaning it is not located on or immediately adjacent to the site of impacts but is within the same watershed. In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu sponsor (usually a public agency or non-profit organization) that uses the funds to build and maintain a mitigation site. Similar to banking, in-lieu fee mitigation is off-site. Permittee-responsible mitigation involves the restoration, establishment, enhancement, or preservation of wetlands undertaken by a permittee. The permittee is responsible for the implementation and success of the mitigation, which can occur at the site of impacts or at an off-site location within the same watershed.

3.2.4.2.3 Wetlands Reclamation

Fort Wainwright reduces impacts from military and non-military activities to wetlands and waterbodies through the implementation of site-specific repair and restoration techniques approved by the USACE and other regulatory agencies. Wetland reclamation is coordinated through the Land Rehabilitation and Maintenance program. Techniques for repairing damage include installing water bars on roads and paths to prevent erosion and re-contouring and re-vegetating areas where erosion has occurred. Specific procedures for the rehabilitation of military training activity areas are outlined in Appendix G. Recreational use impacts are often similar to those resulting from military activities. Thus, rehabilitation measures used for military training impacts also applied to areas damaged by recreational use. Environmental Resources Department staff are responsible for monitoring and documenting the effectiveness of rehabilitation efforts.

3.2.4.2.4 Army Compatible Use Buffer (ACUB) Program and Wetlands

Fort Wainwright has partnered with governmental and non-governmental agencies to protect wetlands and training through the implementation of a comprehensive ACUB program. Fort Wainwright's ACUB establishes buffer areas around the installation that limit the effects of encroachment and maximize the amount of land inside the installation that can be used to support the installation's mission. By establishing buffers in open areas, the ACUB helps preserve wetlands, waterbodies, and other high-value

ecosystems while limiting incompatible development in the vicinity of Fort Wainwright, which benefits the mission, environment, and surrounding community.

3.2.5 Pest Management

Pest management goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Pest management goals and objectives are:

- Meet requirements defined by the Army pest management program measures of merit.
- Use alternative strategies (sanitation, trapping, biological control, mechanical control, etc.).
- Select the least toxic pesticides.
- Select precision application techniques that target specific pests and habitats.
- Emphasize education, communication, monitoring, inspection, and record keeping.

Additional information on pest management can be found in the Fort Richardson and Fort Wainwright Installation Pest Management Plans (Fort Wainwright 2008) and in Appendix B, Section B2.5.

3.2.5.1 Installation Pest Management Plan

Environmental Resources Department is responsible for maintaining and updating the Installation Pest Management Plan. The goal of the Installation Pest Management Plan is to minimize the adverse environmental impacts of using pesticides while achieving an acceptable level of control and cost-effectiveness. Completion and updates of the plan are required to meet Installation Management Office - Pacific Region pest management measures of merit. This plan discusses specific actions necessary to accomplish pest management. Pest management planning is a requirement of Army Regulation 200-5 and DOD Instruction 4150.07. The Fort Wainwright Installation Pest Management Plan must be reviewed annually and updated at least once every five years.

3.2.5.2 Pest Management Monitoring

Pest inventory and monitoring is accomplished through surveys by pest control personnel. Other natural resource monitoring efforts also contribute to pest inventory and monitoring. Range and Training Land Assessment, in particular, monitors vegetation annually and identifies any invasive and exotic plant species in the training areas.

3.2.5.2 Pest Management

Application of all herbicides and pesticides must be conducted in accordance with the Fort Wainwright Pest Control Plan and all applicable laws and regulations. Pest management is accomplished through the maintenance and update of an Installation Pest Management Plan as well as through direct measures designed to control pests. Vegetation control is required on the airfield, shoulders of main roads, storage areas, and in pavement cracks. Weeds such as dandelions, knotweed, crabgrass, etc. are treated when requested on a service or work order. Chemical control is a last resort option. Any plant control activities associated with withdrawn lands will consider the BLM strategic noxious weed control plan.

Pest management is the responsibility of Directorate of Public Works, specifically a certified pest controller. Other organizations involved include Provost Marshal's Office Conservation Officers and Directorate of Public Works Environmental Resources. The Pest Management Coordinator is not involved in routine pest management operations, but serves as a technical advisor to the program.

3.2.6 Invasive Species

Executive Order 13112 requires all federal agencies to prevent the introduction of invasive species, to provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species may cause. Invasive species can be a threat to natural resources, impact local economies, and adversely affect the military mission. EO 13112 established the national invasive species council and the invasive species advisory committee. This committee has defined Invasive Species as those species that are not native to the ecosystem under consideration and that cause or are likely to cause economic or environmental harm or harm to human, animal, or plant health. Plant and animal species under domestication or cultivation and under human control are not *invasive species*. Furthermore for policy purposes, to be considered invasive, the negative impacts caused by a non-native species will be deemed to outweigh the beneficial effects it provides. Finally, a non-native species might be considered invasive in one region but not in another. Whether or not a species is considered an *invasive species* depends largely on human values. By attempting to manage *invasive species*, we are affirming our economic and environmental values. Those non-native species judged to cause overall economic or environmental harm or harm to human health may be considered invasive, even if they yield some beneficial effects. Society struggles to determine the appropriate course of action in such cases, but in a democratic society that struggle is essential. Additional information on invasive species management can be found in Appendix B, Section B2.6.

Fort Wainwright's goal is to detect and manage invasive species in order to inhibit negative impacts to the environment and military training operations. Objectives of the program are to:

- Conduct annual surveys for invasive species including but not limited to plants, fish, birds mammals, amphibians and insects.
- Determine the location and extent of invasive species on Fort Wainwright lands.
- Map locations of invasive populations, maintain a current Geographic Information System database for proactive management, and share information with the Alaska Natural Heritage Program (AKEPIC) invasive database.
- Develop and implement protocol to inhibit movement of invasive species among posts from military convoys and training exercises.

Invasive species monitoring has occurred informally through the Range and Training Land Assessment program and natural resources program. The Range and Training Land Assessment program has quantitatively documented invasive plant species on training lands at plot locations, and pest control manages invasive plant species in cantonment areas. New methods are needed for surveying Army lands that specifically focus on invasive alien species. Fort Wainwright lands currently have few faunal invasive species and the primary focus of these efforts are currently invasive vascular plants such as *Elodia spp*..

3.2.6.1 Invasive Species Survey and Monitoring

Various natural resources studies are continually occurring within the installation. These projects span fisheries management, small mammal inventories, flora and fauna planning level surveys and a multitude of avian surveys. These surveys document invasive species present. If the presence of a new invasive species is discovered, the ecosystem management team discusses management options and appropriate actions are taken to minimize potential damage to the environment and military training opportunities. This has been done opportunistically to date.

The Range and Training Land Assessment program conducts annual natural resources monitoring on training lands and documents vegetation and invasive species during surveys. Range and Training Land Assessment conducts three types of invasive plant surveys: Assessment plots, incidental spotting surveys, and target area surveys. Formal comprehensive inventories have not been conducted. Invasive species that occur, their locations, infestations and distributions need to be identified and a formal monitoring program implemented.

3.2.6.2 Invasive Species Management

Invasive weed species are often spread through purchase, transportation and use of contaminated seed, forages, topsoil, gravel and plant materials. Mechanized travel by road and waterways is the most common agent for spreading invasive plant species. Control methods for invasive species are determined based on the species, and degree and extent of infestation. For invasive plant species, no one control method or solution usually exists for management. Several methods shall be considered including biological control (using organisms to reduce populations), manually pulling, mowing, and herbicides. After it has been decided to take management action, the main options available to land managers for control of invasive species are prevention, and mechanical, biological, and chemical treatment.

Invasive species management should include collaborative efforts with area agencies and entities. Much work on invasive species is being conducted by the ADFG, National Park Service, University of Alaska Fairbanks, BLM, and the Alaska Committee for Noxious and Invasive Plants Management in Alaska. Fort Wainwright's invasive species program strives to include recommendations from management plans developed by these agencies.

3.2.7 Agricultural Outlease Management

Military land will be routinely examined to determine what areas, if any, can be made available for outlease in accordance with Army Regulation 405-80. In accordance with the concept of multiple land use, areas that are required to support the military mission may also be outleased for agricultural purposes. Frequently, areas that are held for future development support the military mission as buffer, security, or safety zones; and areas used for training, ranges, storage, airfields, etc., can be leased for the growing of agricultural crops or livestock grazing and still fulfill the required military use. Leasing of land for uses that are compatible with mission requirements can reduce installation maintenance efforts, provide opportunities for accomplishing land maintenance by the lessee at no cost to the installation, provide funds which the Army can use to support leasing efforts and other natural resources requirements, and support community relations and the local economy.

Currently, there are no areas in Fort Wainwright that are used for agricultural leases. If any Fort Wainwright lands are evaluated in the future for this type of outlease, agriculture outleasing shall be conducted in such a manner to support mission operations, support conservation compliance, and execute natural resources stewardship, maintain healthy ecosystems, sustain biodiversity. Additional information on agricultural outleases can be found in Appendix B, Section B2.7.

3.2.8 Minerals Management

Mineral resources on public lands withdrawn for military purposes in Alaska are managed by BLM under federal regulations found in 45 CFR 3000. Sale and/or free use of mineral materials require National Environmental Policy Act review and Fort Wainwright concurrence. Unauthorized use of mineral materials is considered trespass and will be resolved jointly by the military and the BLM.

Minerals management goals and objectives are listed below:

- Manage the mineral resources on Fort Wainwright lands in the best interest of the public within the framework of the military mission.
- Provide the military with a source of saleable construction materials for military construction purposes.

The BLM identifies three categories of mineral resources on federal lands:

Locatable minerals include most metals, metallic ores, and some non-metallic minerals. If the land is open to mineral location under the federal mining laws, private citizens may stake or "locate" a claim, perform assessment work, and develop the resources. Valid mining claims can result in private ownership of the mineral resources. The withdrawn areas have been closed to mineral location since the 1950s. There are no valid or existing claims within the withdrawals.

Leaseable minerals include oil, gas, coal, geothermal resources, oil, shale, gilsonite, phosphate, potassium, and sodium. These mineral resources are leased from the federal government for a period of time and do not become the developer's property. The withdrawn areas have been closed to mineral leasing since the 1950s. There are no valid leases on withdrawn lands.

Saleable minerals consist basically of construction materials such as sand, gravel, riprap, cinders, pumice, clay, limestone, and dolomite. They are purchased outright from the federal government. Saleable materials on the withdrawals have been used locally by the Army and other authorized agencies, but have not been extracted commercially since the lands were first withdrawn in the 1950s.

The military may use sand and gravel for its purposes; this authority flows from the military withdrawal act itself. Measures to safeguard resource values outlined in 43 CFR 3100, 43 CFR 3600, and 43 CFR 3809 will apply to mineral development on the withdrawn lands. Under the terms of the Military Lands Withdrawal Act of 2001, should the withdrawn lands be opened to mineral location, mineral patents would convey title to locatable minerals only. These patents would also carry the right to use as much of the surface as is necessary for mining under the guidelines established by the Secretary of the Interior by regulation.

Mining and other activities which involve substantial ground disturbance are prohibited from all drop zones and landing fields, where a relatively smooth surface is necessary for safe military operations, and within one mile of all existing roads and major trails. Mineral material sites are exceptions to this.

3.2.9 Integrated Training Area Management

Army training is designed to challenge Soldiers, leaders, and units. As the Department of Defense's premiere land force, the Army relies on land to achieve its training and testing objectives and to maintain force readiness. Force readiness depends on high quality realistic training. The use of these lands for training and testing purposes causes damage that can potentially reduce the quality of training on these lands. The Integrated Training Area Management program serves the overall needs of the Army by overcoming the apparent conflict between force readiness and stewardship.

There are five components of the Integrated Training Area Management program. These five components work in unison to accomplish the Integrated Training Area Management mission:

- Range and Training Land Assessment
- Training Requirements Integration
- Land Rehabilitation and Maintenance

- Sustainable Range Awareness
- Geographical Information System (see Section 4.8.1 for details).

The Integrated Training Area Management program is the Army's formal strategy for focusing on sustained use of training and testing lands. The intent of the Integrated Training Area Management program is to systematically provide a uniform training land management capability across the total Army. The Army will manage its lands in a manner to ensure no net loss of training capabilities and to support current and future training and mission requirements. The integration of environmental stewardship principles into training land and conservation management practices ensures that the Army's lands remain viable to support future training and mission requirements. Additional information on the Integrated Training Area Management program can be found in the USARAK Range Complex Master Plan, section 3 - Training Lands.

3.2.9.1 Range and Training Land Assessment

Range and Training Land Assessment is the component of the Integrated Training Area Management program that provides for the collecting, inventorying, monitoring, managing, and analyzing of tabular and spatial data concerning land conditions on an installation. Range and Training Land Assessment provides data needed to evaluate the capability of training lands to meet multiple use demands on a sustainable basis. It incorporates a relational database and Geographic Information System to support land-use planning decision processes. Range and Training Land Assessment collects physical and biological resources data to relate land conditions to training and testing activities. These data are intended to provide information to effectively manage land use and natural resources.

3.2.9.2 Training Requirements Integration

Training Requirements Integration is a decision support procedure that integrates all requirements for land use with natural and cultural resources management processes. Training Requirements Integration integrates the installation training and testing requirements for land use derived from the Range and Training Land program, the range operations and training land management processes, and the installation training readiness requirements with the installation's natural resources conditions. The integration of all requirements occurs through continuous consultation among Range Control, natural and cultural resources managers, and other environmental staff members. Training Requirements Integration supports the Army's requirements for environmentally sustainable training lands. Training Requirements Integration improves coordination and facilitates cooperation, decision-making, and allocation by providing uniform information regarding land conditions, trends, and any necessary modification of requirements. The Training Requirements Integration goals are achieved when training and environmental requirements are balanced in the decision-making process.

3.2.9.3 Land Rehabilitation and Maintenance

Land Rehabilitation and Maintenance is a preventative and corrective land rehabilitation and maintenance procedure that reduces the long-term impacts of training and testing on an installation. It mitigates training and testing effects by combining preventive and corrective land rehabilitation, repair, and/or maintenance practices. It includes training area redesign and/or reconfiguration, and training area access improvements to meet training requirements. Land Rehabilitation and Maintenance uses vegetation management and erosion control techniques to maintain soils and vegetation required to support the military mission. These specifically designed efforts help maintain quality military training lands and minimize long-term costs associated with land rehabilitation or additional land purchases.

3.2.9.4 Sustainable Range Awareness

Sustainable Range Awareness is the component of the Integrated Training Area Management program that seeks to foster a conservation ethic in military personnel. The educational materials produced by the Sustainable Range Awareness program describe the principles of land stewardship and the practices of reducing training and/or testing impacts. Sustainable Range Awareness provides a means to educate "other land users" on their environmental stewardship responsibilities as well. Sustainable Range Awareness materials also include information geared towards environmental professionals concerning the operational requirements for Army training. The Sikes Act requires "no net loss" in the capability of military lands to support the military mission. Sustainable Range Awareness supports this compliance goal by reducing maneuver damage, reducing long-term maintenance costs for repair of training lands, and improving operational security skills. When land users practice environmental stewardship in the field, they are also achieving Army mission objectives. The Sustainable Range Awareness program provides the land users with an understanding of how mission, training, testing, and other activities impact the land's capacity for sustaining a realistic training environment. Sustainable Range Awareness also educates land users on how their land use affects the resident wildlife and vegetation.

3.3 Forestry and Wildland Fire Management

Forest and wildland fire management is an extremely important tool to protect, maintain, and enhance military training environments. Interior Alaska ecosystems require fire for continued functionality. However, wildfires are also a concern in Alaska due to their impact on human activities and structures, and military operations. Without forest and wildland fire management, vegetation communities become much less diverse, and animal species normally associated with certain successional stages find the environment unsuitable. Forest and wildland fire management rejuvenates these ecosystems and supports the military mission.

The Forestry and Wildland Fire Management Plan is a component of the Fort Wainwright Integrated Natural Resources Management Plan Appendix C. This plan covers the management, maintenance, protection, and improvement of forest vegetation on Fort Wainwright managed lands in Alaska. This plan meets the Public Law 106-65 requirement for a forest management plan on military withdrawn lands in Alaska as outlined in the BLM Fort Wainwright and Fort Greely Resource Management Plans (BLM 1995b/a). This plan meets the Army requirement for an Integrated Wildland Fire Management Plan and supports the Alaska Interagency Fire Management Plan.

3.3.1 Forest Management

The Fort Wainwright forest management program is required to support and enhance the immediate and long-term military mission and meet natural resource stewardship requirements set forth in federal laws. Forest ecosystems perform important, sometimes unique, natural resource functions which are inherently valued and which are of benefit to all living things. The objectives and benefits of forest ecosystem management include: biodiversity of species and habitat; natural beauty; outdoor recreation opportunities; wildlife habitat, including habitat for threatened and endangered species of plants and animals; soil conservation and watershed protection, including erosion control; improvement of air and water quality; sustained production of commercially valuable forest products; noise abatement; and the sustainment of viable and diversified training lands to meet the military mission.

3.3.1.1 Forest Management Planning and Integration

A forest management plan is a required component of the INRMP for Fort Wainwright lands in Alaska. The Fort Wainwright (BLM 1994b) and Fort Greely (BLM 1994a) Resource Management Plans also require the development of forest management plans compatible with achieving the military mission. This component plan meets both of these requirements. The forest management plan must consider military mission, preservation of habitat, and recreation for all of these forested acres. Harvests of timber products from Fort Wainwright lands are permitted, but not mandatory. Management of the forest ecosystem is one of the most critical aspects of land management on the installation due to the high percentage of forested land and its importance to wildlife. The management of forest and woodland resources on Fort Wainwright is consistent with ecosystem management principles. It must also consider ecosystem management principles of preservation and manipulation of habitat, conservation of wildlife, outdoor recreation, and public safety. This forest management plan addresses allowable harvest levels, reforestation methods, and appropriate silvicultural methods by measuring the impact of each on military needs, recreational opportunities, and economic considerations.

3.3.1.2 Forest Inventory and Monitoring

Inventory and monitoring of Fort Wainwright's forest resources provide an indicator of ecosystem integrity, biodiversity of species and habitats, and sustained production of commercially valuable forest products. In addition, inventory and monitoring help to determine areas where improvements or rehabilitation are needed to maintain ecosystem integrity and to support military training activities. Inventories are conducted by forestry crews from the Fort Wainwright Natural Resource Forestry Office with equipment purchased for the purpose of conducting these inventories.

3.3.1.3 Forest Protection

Forest resources are protected on Fort Wainwright lands through this INRMP as well as through local and Army wide regulations. The three primary activities on Army lands that can affect forest resources are military activities, timber sales and construction activities. USARAK Regulation 350-2, *Range Regulation*, regulates military activities. USARAK Regulation 350-2 allows minor use of vegetation during training exercises but prohibits clearing of trees larger than 4 inches in diameter. Spruce boughs are only to be collected from trees sized less than four inches diameter-breast-height. USARAK Regulation 350-2 also prohibits open fires in the training areas. This INRMP establishes best management practices (see Appendix G, Supplements) during the conduct of timber sales, clearing or construction activities to protect surrounding forest resources, wetlands, surface water and wildlife. Construction activities that affect commercial forest resources are regulated by Army Regulation 200-1, *Environmental Protection and Enhancement* (2009) and DoDI 4715.03 which state:

> "Commercial forest products will not be given away, abandoned, carelessly destroyed, used to offset costs of contracts, or traded for products, supplies, or services. All forest products are to be accounted for and commercial harvests completed prior to the start of any construction that may impact forest resources. When forest products are removed from Army lands by any means other than a commercial timber sale, a dollar amount equal to the fair market value is to be deposited to Budget Clearing Account 21F3875.3960 20-C S99999 for products removed."

If construction activities cannot avoid clearing of forest resources, construction activities must follow the Fort Wainwright forest timber policy to minimize impacts and effectively utilize forest products. The timber policy is found in Appendix C, Section 2.1.3 as well as Appendix G, Section G3.1.

3.3.1.4 Forest Health

Maintaining good forest health is a primary objective of the Fort Wainwright forestry program. The Fort Wainwright forestry program must be integrated with the Fort Wainwright Installation Pest Management program and the U.S. Department of Agriculture Forest Service. Section S of the Cooperative Forestry Assistance Act of 1978 (16 U.S.C. 2101) authorizes the Secretary of Agriculture to protect trees and forests, wood products, stored wood and wood in use from insects and diseases. The Forest Service has the delegated responsibility for carrying out the provisions of the Cooperative Forestry Assistance Act on Fort Wainwright lands. It is intended that the Forest Service will provide technical assistance and appropriate funds to meet specific pest management project objectives to provide foliage protection, reduce specific insect and disease populations, reduce the risk of artificial spread to uninfested areas, and prevent tree mortality. Additional information on the forest health program is found in Appendix C, Section C2.1.4.

3.3.1.5 Forest Land Improvement

Forest land improvement on Fort Wainwright lands involves reforestation, timber stand improvement and habitat improvement using scientific silvicultural principles. Fort Wainwright uses hand thinning, mechanized thinning and clearing, timber sales and prescribed burning to accomplish these silvicultural treatments. The major objective of the Fort Wainwright's forestry program is to promote a healthy ecosystem capable of supporting mission and conservation requirements. Silvicultural treatments will be designed to restore, maintain, and improve the ecological functions and values of the particular forest unit being managed. Silvicultural treatments used on Army lands will be designed to improve military mission areas and, when possible, attain multiple use and sustained yield timber management while enhancing watersheds, wildlife habitats, and natural beauty values along scenic corridors.

Fort Wainwright strives to design management activities to maintain a mix of native forest types (including aspen, birch, mixed hardwood-spruce, and white spruce types) and stand ages. Harvests activities are located and designed to provide key benefits of natural disturbances, particularly fire. These benefits include warmer soils, increased sunlight, a mosaic of vegetation patterns, fuel reduction, and some wood left on harvested sites, such as snags, logs, and diseased trees. Specific cuttings will be designed to achieve site-by-site objectives.

The objective of Fort Wainwright's silvicultural program is to promote a healthy ecosystem capable of supporting the military mission and conservation requirements. Silvicultural treatments are designed to restore, maintain, and improve the ecological functions and values of the particular forest unit being managed. Silvicultural treatments used will improve military mission areas and, when possible, attain multiple use and sustained yield timber management while enhancing watersheds, wildlife habitats, and natural beauty values along scenic corridors. When silvicultural treatments provide opportunity for commercial sale of forest products, each commercial forest activity will be performed in accordance with 10 USC 2665, and operating expenses will be commensurate with anticipated financial returns on lands on which the Army holds vegetation rights.

3.3.1.5.1 Reforestation

The objective of the forest regeneration program is to quickly reestablish trees on cleared and harvested sites. Regeneration of forests, either natural or planned, is an essential part of forest ecosystem development. Regeneration of forests can be made through planting seedlings, planting sprigs, coppice cuts or seeding. Regeneration of forests, either naturally or artificially, is an essential part of forest ecosystem development.

3.3.1.5.2 Timber Stand Improvement

Timber stand improvement activities are designed to improve the quality of forest stands, support military training activities, and improve wildlife habitat. Timber stand improvement is often categorized as noncommercial activities used to improve the quality of commercial timber, but it may also be used to improve forest conditions for other uses. Timber stand improvement may include thinning, spacing, chemical injection, chipping, prescribed burning, etc., all of which are designed to improve species composition, quality, and/or growth rate of existing stands by removing competing vegetation to allow preferred trees to grow faster. Timber stand improvement is also an effective treatment for wildland fire hazard fuel reductions and insect and disease control. Usable material from timber stand improvement projects will be disposed of through timber sales or the personal use firewood program.

3.3.1.5.3 Forest Timber Sales

Timber sale activities are designed to improve the quality of forest stands, support military training activities, and improve wildlife habitat. Timber sales are categorized as commercial activities. Timber sales on portions of Fort Wainwright lands could be used to improve conditions for conduct of the military mission as well as and enhance the local economy. BLM and Army timber management practices and contract stipulations govern timber sales on Fort Wainwright lands. Timber sales on withdrawals where the Army holds vegetation rights will be governed by Army practices and contract stipulations. Any sale of timber on the PL106-65 withdrawn lands would be governed by common BLM timber management practices, contract stipulations, and the mandates of the State's forest practices regulations.

3.3.1.5.4 Firewood/Personal Use Program

The Firewood/Personal Use program consists of Christmas tree cutting, house log harvesting, and firewood cutting. Christmas tree permits are free and available starting December 1 each year. Designated cutting areas vary year by year. The topping of larger trees is not allowed, nor is cutting trees over 15 feet tall. On Fort Wainwright lands where Fort Wainwright controls vegetation rights, firewood permits are sold for current market value. Long term designated firewood cutting areas are established in several training areas.

3.3.1.6 Urban Forestry

The integrated urban forest ecosystem encompasses many environments, disciplines, and concepts. This includes open lands, water, and vegetated areas in and adjacent to improved and semi-improved grounds as well as woodland borders. The urban forest includes individual trees as well as groupings and small tracts scattered among more dominant land uses. Multiple use of this resource must occur within and among this complex system of interspersed land uses. Urban forests are valued primarily for their non-consumptive contributions to our everyday lives and the environment in which we live.

3.3.1.6.1 Landscape Plantings

All planting, pruning, cultivation, and other maintenance will conform to criteria in Army Technical Manual 5-630, ANSIZ60 standards, and the approved Installation Design Guide. Landscaping will be functional in nature, simple and informal in design, and meet professional standards for species selection and installation design. The landscaping will be compatible with adjacent surroundings, and complementary to the architectural features and the overall natural setting of the area.

3.3.1.6.2 Tree City USA

The National Arbor Day Foundation, in cooperation with the United States Department of Agriculture, Forest Service and the National Association of State Foresters, recognizes towns and cities across America that achieve the standards of the Tree City USA program. The Tree City USA program is

designed to recognize those communities that effectively manage their public tree resources, and to encourage the implementation of community tree management based on four Tree City USA standards. Fort Wainwright will apply annually for the Tree City USA designation when resources allow and Fort Wainwright has met the requirements to apply.

3.3.1.6.3 Installation Aesthetics and the Army Communities of Excellence Program

The Army Communities of Excellence and self-help program initiatives provide a means to enhance the aesthetics of the installation, provide an opportunity for all personnel to improve their living and working areas, reduce maintenance costs, and increase the overall value of the Army's physical establishment. Special days (Arbor Day, Earth Day, and so forth.) should be designated to promote annual self-help awareness and participation. Both day-to-day type operations and maintenance and project type work will be performed in a way to enhance installation aesthetics.

3.3.1.6.4 Nurseries

Expenditure of appropriated funds is not authorized for the operation of commercial plant nurseries. Trees and shrubs will be obtained from commercial nurseries and federal and state agencies when available. If economical, and in compliance with the INRMP and the Installation Master Plan, trees and shrubs from planted areas as well as natural areas may be used, providing they can be transplanted with sufficient roots and soil to meet American Association of Nurseryman Standards and that the site and associated biological resources will not be adversely impacted.

3.3.1.7 Forestry Outreach

Public involvement is a key component to Fort Wainwright's commitment to community outreach. Implementation of this plan requires keeping the public informed of firewood and Christmas tree cutting areas, providing permits, and other items of interest. Arbor Day activities are centered around the public tree planting ceremony. Additional activities include educational presentations on Arbor Day, tree care, and forestry practices. The Environmental Resource Offices schedule media and tree seedling give-away events at Fort Wainwright for Arbor Day.

3.3.1.8 Forestry Funding

Installation forest management and silvicultural expenses may be charged to various Army accounts, including Base Operations - Environmental Conservation, Maintenance and Repair - Grounds, Fire and Emergency Response Services. Forest management and silvicultural activities may be supplemented by the Conservation Reimbursable Forestry Account. The Conservation Reimbursable Forestry Account is a supplemental fund that fluctuates, in terms of total Army-wide proceeds, from year to year based on mission needs, force protection level, forest product market conditions, etc. Allocation of installation specific Conservation Reimbursable Forestry Account funds will be determined through the process outlined in the Protocol for Determining Recommended Installation Specific Forestry Automatic Reimbursable Authority - Initial Budget Build and Continuing Adjustments. Projects must support the mission. Projects must not encumber land that is needed for conducting mission operations. Projects must comply with applicable laws and have an INRMP developed in accordance with the National Environmental Policy Act that addresses the impact, if any, on the composition, structure, and function of natural communities and biological diversity. Projects must be a fiscally sound investment and capable of ecosystem sustainability.

The Department of Defense Forestry Reserve Account was established under 10 USC 2665, to collect surplus funds from the sale of forest products. These funds are the monies remaining after program expenses are reimbursed and the state entitlements are paid. Installations of all the Services may apply for Department of Defense Forestry Reserve Account funds to fund natural resources management projects,

even if that installation has not received Conservation Reimbursable Forestry Account dollars. The state of Alaska is entitled at the end of each year to 40% of the net revenue of forest product disposal from Fort Wainwright lands. Net revenue is defined as the gross proceeds received less the amount of reimbursement of appropriations to the Department of the Army on an installation pro-rata basis.

3.3.2 Integrated Wildland Fire Management

Fire is critical for maintaining the viability of boreal ecosystems, yet fire can also be a threat to human life, property, and valued resources. The realization that fire plays an essential ecological role, but also has a destructive potential in relation to human life and values can render the decision-making process very difficult. This component plan describes the programs, policies and procedures for integrated wildland fire management on Fort Wainwright lands.

This component of the INRMP serves as the Fort Wainwright Integrated Wildland Fire Management Plan (for the entire Integrated Wildland Fire Management Plan, see Appendix C, Section 2.2). This Integrated Wildland Fire Management Plan reduces wildfire potential, effectively protects and enhances valuable natural and cultural resources, integrates applicable state and local permit and reporting requirements and implements ecosystem management goals and objectives on Fort Wainwright lands. The Integrated Wildland Fire Management Plan directly supports USARAK missions and is consistent with Fort Wainwright emergency operations plans, while being integrated into the INRMP, the Fort Wainwright's fire and emergency services plan, and the Integrated Cultural Resources Management Plan.

The goal of the Fort Wainwright Integrated Wildland Fire Management Plan is to establish fire management procedures and protocols to provide Fort Wainwright the capability to complete its mission to maintain combat readiness and fulfill resource management intent. Implementation of this Integrated Wildland Fire Management Plan maintains and enhances the health, productivity, and biological diversity of Fort Wainwright lands.

Wildland fire management in Alaska requires multi-agency cooperation. Fire management is a joint effort by Fort Wainwright and the BLM, Alaska Fire Service. The agencies have developed agreements which establish the Alaska Fire Service's responsibility for all fire detection and suppression on installation lands. In exchange, the Army provides the Alaska Fire Service with use of certain buildings, utilities, land, training services, air support, and other support services.

The values to be protected on Army training lands from wildfires include personnel safety, built-up improvements (structures, electronic weaponry, and targets) some 3rd party permitted equipment and cultural resources. Unauthorized structures will be allowed to burn during wildfires. Alaska Fire Service has been notified of the locations of all known illegal structures. Since fire is a natural component of the ecosystem in Alaska, there are no natural resources that require protection.

3.3.2.1 Pre-Suppression Actions

In fire-prone areas, climate, human activity, and types of vegetation (or fuels) determine the level of wildland fire risk. Pre-suppression activities are those activities that reduce wildland fire risk. These pre-suppression actions are planning, prevention, fuels management, and prescribed burning.

3.3.2.1.1 Pre-Suppression Planning

Pre-suppression planning stresses safety, effective fire response planning, and pre-suppression priority. Public and firefighter safety is the first and highest priority. Safety is the responsibility of everyone assigned to a wildfire incident. Safety is an attitude that must be promoted at all operational levels. Once personnel are committed to an incident, those resources become the highest value to be protected. Fire

response planning is a continuing process. Most fire planning is based on five years of records including both fire weather and fire occurrence. Pre-suppression priorities for Fort Wainwright lands are established by this Integrated Wildland Fire Management Plan component of the INRMP. Pre-suppression priorities are shown for each training area in Chapter 4. The Alaska Wildland Fire Management Plan established four fire management options to be used by land owners to determine pre-suppression priorities: Critical, Full, Modified, and Limited. Land managers may select among these options for different parcels of land, based on evaluation of legal mandates, policies, regulations, resource management objectives, and local conditions (Alaska Wildland Fire Coordinating Group 1998).

3.3.2.1.2 Prevention

Fire prevention activities include fire prevention education, enforcement, engineering, Fire Danger Rating system, automated weather stations, and ignition control policy. In coordination with Range Control and resource protection managers, fire prevention orientation and training programs will be designed and implemented to explain wildfire ignition potentials, probability of escape, impact on natural resources, and the threat to high value areas within and outside of each installation. The FireWise Program was established nationwide to convey information to private homeowners on how to protect their property from wildfires. Enforcement is a very important component of an effective fire prevention program. Engineering involves the alteration of a range design/alignment or physically disrupting the fuels to reduce the likelihood of a fire starting or to reduce its effects if one does start. The Fire Danger Rating System is outlined in USARAK Range Regulation 350-2. The system follows the Canadian Forest Fire Danger Rating System and utilizes the Fire Weather Index. Currently there are seven fire weather stations located across Fort Wainwright training areas: Fort Wainwright Small Arms Complex, Manchu Range, Stewart Creek Impact Area, Blair Lakes Range, Mark Lake, Battle Area Complex and OP 26 in Donnelly Training Area. There are also fire weather stations located on the cantonment areas at Fort Wainwright and Fort Greely. Ignition control is accomplished primarily through the enforcement of the Fire Danger Rating system by controlling the use of classes of ammunition and pyrotechnics that have higher fire hazards associated with their use. The Fire Danger Rating is provided to Range Control, which restricts the use of munitions and pyrotechnics as fire danger increase.

3.3.2.1.3 Fuels Management

Wildfire danger can be reduced through the management of fuels. Fort Wainwright conducts fuel management by conducting fuel hazard assessments and by constructing and maintaining a combination of fuel breaks and firebreaks through the mechanical removal of fuels and through prescribed burning. Fuel assessments evaluate vegetation flammability at a landscape scale, weather, historical fire patterns, fire behavior and proximity to values at risk. Fuels modification is defined as removing and/or modifying an area or wide strip of flammable vegetation. Fuel modification can provide a reduction in radiant and convective heat, thereby providing fire suppression forces a safer area in which to fight the fire. Fire hazard is managed by changing the vegetation type. The goal is to maintain a fuel condition that makes fires easier to control. Maintenance treatments are necessary because the flammable biomass will grow back over time thus making fires more difficult to suppress. Fort Wainwright maintains a fuel break/firebreak system on locations with the highest wildfire risk to minimize the spread of fires. If a wildfire escapes the initial attack, fuel breaks and other fuel modification areas provide the most logical location for fire containment lines. Well-maintained fuel breaks and fuel modifications provide defensible space that aids in wildfire containment.

3.3.2.1.4 Use of Prescribed Fire

Prescribed burning is defined as the controlled application of fire under specified environmental conditions that allow the fire to be confined to a predetermined area while at the same time producing fire behavior required to attain resource management objectives. Prescribed burns mimic the important ecosystem functions of wildfire while reducing risk to human environments and other resources. Fort Wainwright, in cooperation with the Alaska Fire Service, conducts prescribed burns on its installations to

improve wildlife habitat, to decrease the potential for ignitions and fire escape from live firing, and to increase the size of military training areas. Because of the potential for unintended circumstances, extensive planning, coordination, and risk management must be completed prior to ignition of any prescribed burn.

3.3.2.2 Fire Suppression Actions

The objective of fire suppression is to attack and suppress wildfires at minimum cost while protecting values at risk and minimizing the impacts from suppression activities. In some cases, a wildfire on Army training lands can be controlled with a single attack response vehicle; in others, large numbers of firefighters, fire apparatus, and equipment may be required. Because of this range of resource needs, fire suppression can be relatively simple and straightforward or extremely complex.

3.3.2.2.1 Wildfire Incident Coordination

Wildfire suppression follows the incident command system. The incident commander is responsible for suppression and management of a wildfire. The military zone of Alaska Fire Service is dedicated to the management of wildfires on Fort Wainwright lands. The Fort Wainwright Fire Chief is responsible for all fires and must be informed of the status of new and ongoing wildfires.

3.3.2.2.2 Fire Suppression Actions

Wildfire suppression is conducted by the BLM, Alaska Fire Service and/or the military fire department. The State of Alaska, Division of Forestry may be called upon for assistance as well as local fire departments. Alaska Fire Service is responsible for wildfires on Fort Wainwright lands in exchange for use of the facilities at Fort Wainwright. The Wildland Fire Situation Analysis is a systematic and documented decision process employed to determine the most appropriate suppression strategy for a particular situation.

3.3.2.2.3 Special Considerations for Suppression

Protection of the local environment will be considered in fire management strategies, particularly in the location of fuel breaks and control lines. Bulldozers are a useful tool in fire suppression efforts but can have a severe impact on natural and cultural resources. Fire managers must be familiar with the long-term effects of physical ground/vegetation disturbance, potential of alien vegetation introduction, through the use of dirty equipment or the creation of invasion routes, creation of erosion problems, protection of cultural sites, limitations on use of fire suppression chemicals (foam and retardant), the aerial use of chemical retardant, fire foam and saltwater will be weighed against the potential for fire damage to sensitive plants.

Use of aerial fire retardant near lakes, wetlands, streams, rivers, sources of human water consumption, and areas adjacent to water sources should be avoided to protect fish habitat and water quality. If feasible in these areas, the use of water rather than retardant is preferred. When the use of retardant is necessary, avoid aerial or ground application of retardant or foam within 300 feet of a waterway; application beyond 500 feet is preferred. Examples of when the use of retardant is authorized are for the protection of:

- Human life.
- Permanent year-round residences.
- National Historic Landmarks.
- Structures on or eligible for the National Register of Historic Places.
- Government facilities.
- High value resources on BLM managed land and those of adjacent land owners.
- Threatened, endangered, and sensitive species habitats as identified by resource specialist.

3.3.2.2.4 Fire Detection and Reporting

All wildfires are to be immediately reported to Range Control. Range Control will then notify the BLM, Alaska Fire Service and/or the military fire department. Monitoring is defined as the systematic process of collecting, recording and mapping of fuels, topography, weather, fire behavior, and fire effects data to provide a basis for evaluating and adjusting wildland fire management programs.

3.3.2.2.5 Public Information

Wildfire progress monitoring is conducted by the BLM, Alaska Fire Service. Updates can be obtained on their web site http://fire.ak.blm.gov/. Updates for fires where suppression action is required can also be obtained by contacting the public information officer at Alaska Fire Service. The Fort Wainwright installation forester acts as a liaison with the wildfire incident command staff on an as-needed basis conveying land management concerns and providing institutional knowledge of the land. The Fort Wainwright installation forester also relays information from the wildfire command staff to the various installation directorates.

3.3.2.3 Post Fire Actions

3.3.2.3.1 After-Action Review

At the end of each fire season an interagency review of the fire plan implementation and fire suppression operations will be held with fire suppression personnel and land managers. Land managers and fire suppression personnel will be given the opportunity to identify plan implementation problems and operational concerns.

3.3.2.3.2 Rehabilitation

Firelines and camp areas will be rehabilitated to stabilize the burn area and to mitigate the effects of suppression activities. The agency administrator will ensure that the Incident Commander consults with natural resource managers, as needed, regarding any specific rehabilitation needs. When possible, burned areas will be allowed to regenerate naturally. Firelines will be monitored to ensure rehabilitation plans are followed and successful. Invasive species colonization and erosion control are some of the main items monitored after fires.

3.3.2.3.3 Fire Research and Monitoring

Wildfires are monitored for several years after a burn to determine vegetation response, identify erosion issues, and determine if fire suppression actions have been adequately rehabilitated. Monitoring is conducted using a combination of aircraft flyovers, photo points, vegetation plots, and permanent fuel loading sample plots. Prescribed fires are monitored to determine if burn objectives are met, determine fuel loading, and identify rotational periods between burns.

3.3.2.3.4 Fire History

Fire is a frequent and widespread disturbance in interior Alaska that causes well documented stages of vegetation succession. Since fire records were kept starting in 1947, nearly 1.3 million acres of Fort Wainwright has burned. This implies that nearly all of Fort Wainwright has burned since 1947 but some of the burned acreage has burned more than once since 1947. Fire return intervals as high as every 30-55 years have been reported for some forest types in interior Alaska.

Bonito (1980) bases the following summary of post-fire succession on a literature review. The first year after a fire, grasses, fireweed, horsetail, and morel mushrooms are common. Grasses and sedges along streams recover quickly, and birch seeds germinate by the second year. In wet muskeg, a continuous cover of grasses usually can be found within three to five years after a fire. Willow, Labrador tea, and birch recover first, followed by black spruce, and perhaps 100-200 years later, spruce-dominated sites

develop again into muskegs. Post-fire successional stages can differ from this based on the ecotype that burned, the intensity of the fire, and numerous other variables. Lichens may take 50-150 years to recover after a burn. On dry sites, aspen and birch replace willow. The birch may remain for 150 years and may be replaced by white spruce. Repeated burning tends to favor birch/aspen communities.

Alaska Fire Service maintains a wildfire history data base dating back to 1947. A complete list of all recorded fires from Fort Wainwright lands can be found in Appendix C Section 2.2.5 Post Fire Actions. The following sentences present a short summary of the data. 124 fires have been reported on Fort Wainwright since 1947. The average fire size is 10,700 acres. It should be noted that most fires on Fort Wainwright are smaller than 100 acres but fire records at Alaska Fire Service did not record fires less than 100 acres before 1990. 34 fires were reported in the Tanana Flats Training Area for a total area burned of 602,000 acres. Several large fires greater than 20,000 acres burned in the Tanana Flats Training Area in 1957, 1980, 2001, 2009 and 2012. Much of the Tanana Flats Training Area is represented by early successional vegetation communities. 25 fires have been reported in the Yukon Training Area since 1959. 68,000 acres have burned in the Yukon Training Area since 1959 and only one fire was over 20,000 acres. 43 fires have burned in Donnelly Training Area since 1954 with a total area burned of 618,000 acres. 11 fires were over 20,000 acres in Donnelly Training Area. The Gerstle River Training Area has had 4 fires since 1947 with a total area burned of 16,500 acres. The largest fire in the Gerstle Training Area occurred in 1994 and burned over 11,000 acres. Black Rapids Training Area reported one fire in 1950 which burned 1100 acres.

3.4 Fish and Wildlife Management

The fish and wildlife management program provides for the regulation and conservation of game and non-game populations and their habitats. These management practices are consistent with accepted scientific principles, and in compliance with the Endangered Species Act and all other applicable laws and regulations. Further, these goals are in harmony with the total natural resources program. Emphasis is placed on the maintenance and restoration of habitat favorable to the production of indigenous fish and wildlife. Lands and waters suitable for conservation of fish and wildlife resources are managed to conserve fish and wildlife resources. Non-game as well as game species are considered when planning activities. Fort Wainwright's natural resources program has traditionally been based on a multiple-use management philosophy. However, military training has always been and will continue to be the primary land use. Currently maintaining functional ecosystems is priority goal of land and natural resources management programs. "Realistic training lands" are often quoted as essential needs by military trainers.

3.4.1 Fish and Wildlife Memorandum of Agreement

In accordance with the Sikes Act (16 USC 670a), the Fish and Wildlife Memorandum of Agreement (MOA) is the component of the INRMP that describes how the fish and wildlife resources at an installation will be managed. It is a tripartite agreement between the Sikes Act's required partners: Fort Wainwright, the USFWS and ADFG. The MOA provides a program for developing management strategies to conserve fish, and game between the three parties. The MOA provides for fish and wildlife habitat improvements or modifications, wildlife considerations in all range rehabilitation, control of off-road vehicle traffic, use and protection of fish and wildlife resources, to include both consumptive and non-consumptive use, and natural resources law enforcement requirements, and designated responsibilities for the control and disposal of feral animals. The Fish and Wildlife MOA located at the end of this INRMP.

3.4.2 Fish and Wildlife Inventory and Monitoring

Fish and wildlife inventory includes comprehensive planning level surveys designed to identify all faunal species on Fort Wainwright lands. Monitoring involves annual surveys of selected species to track population trends.

3.4.2.1 Fish and Wildlife Planning Level Surveys

Fish and wildlife planning level surveys include baseline surveys for all fish and wildlife species that occur or may occur on Fort Wainwright. These surveys establish presence or absence of species that are identified on Fort Wainwright.

3.4.2.2 Fish and Wildlife Inventory

Faunal inventories include planning level surveys for fish and wildlife. These surveys include surveys for migrant birds, upland gamebirds, waterfowl, waterbird, resident passerines and corvids and raptor species (including bald and golden eagles); moose, bison, caribou, sheep, bear, furbearers, small mammals, amphibians and anadromous and resident fish species.

3.4.2.3 Fish and Wildlife Monitoring

Fish and wildlife monitoring involves the continuation of existing programs and the creation of new long-term monitoring programs for fish and wildlife. Current monitoring efforts specific to Fort Wainwright lands focus on waterfowl productivity, cliff swallow nesting on buildings, sandhill crane roosting, sheep lambing and habitat use, whimbrel nesting, etc. In addition, Fort Wainwright participates in multiple formal interagency efforts to monitor wildlife such as ADFG state surveys for ruffed grouse, willow ptarmigan, and sharp-tail grouse; University of Alaska Natural Heritage Program spring wood frog call counts; University of Alaska Natural Heritage Program Loon and Grebe Watch Monitoring Program; and USGS Alaska Landbird Monitoring Survey and USGS Breeding Bird Survey. Lastly, Fort Wainwright partners with ADFG to conduct annual surveys of moose and sheep on training lands. These monitoring programs are a major component of the Ecosystem Management Program.

3.4.3 Fish and Wildlife Management

Fish and wildlife actions fall into two categories: population management and habitat management. Fish and wildlife population management is accomplished through actions directly affecting wildlife species. Setting population goals and managing harvests are the primary actions used in population management. Habitat management, on the other hand, affects wildlife populations indirectly by manipulating their habitat.

On Fort Wainwright, fish and wildlife populations are managed from local, regional, and ecosystem scales. Local site management occurs when there is specific interest in geographic points or features for monitoring, training, or development purposes. With regional management, a geographic area is targeted for these same reasons. Ecosystem scale management occurs at the level of the range of a particular species because animals are migratory and exhibit seasonal movements that do not adhere to political boundaries such as installations and training areas. Consequently, it is necessary for fish and wildlife management to occur at a larger more inclusive scale.

Fort Wainwright, as a land unit, only contains portions of fish and wildlife populations; therefore, Army management actions will affect the greater population that exists within and outside of the installation boundaries. For example, moose in the Tanana Flats Training Area commonly move into the Tanana uplands of the Yukon Training Area, two distinct ecoregions that exist in the annual range of Interior Alaska moose. For this reason, the Fort Wainwright Natural Resource office carefully considers how fish

and wildlife management will affect populations at larger scales that include portions of both summer and winter ranges.

3.4.3.1 Fish and Wildlife Population Management

Population management includes tracking the health and status of fish and wildlife populations. It includes estimating abundance and/or identifying trends as well as setting quotas for sustained health and harvest of fish and wildlife populations. For example, the ADFG, which establishes hunting, trapping and fishing regulations and harvest objectives, stocks fish in Post lakes, controls nuisance animals, conducts habitat enhancement, and coordinates other projects to conserve and enhance game and non-game populations. Wildlife populations will be managed in accordance with the objectives set forth in this INRMP (detailed under items of specific cooperation between Fort Wainwright, USFWS, and ADFG).

3.4.3.1.1 Fish Stocking

The ADFG, Fairbanks office, stocks lakes on Fort Wainwright through the Statewide Stocking for Recreational Fisheries Plan (ADFG 2011). The ADFG stocks lakes on Fort Wainwright Main Post, Yukon, and Donnelly Training Areas. Donnelly Training Area has nineteen stocked lakes that provide opportunities for recreational fishing.

3.4.3.1.2 Fish and Wildlife Transplanting

There are no plans for transplanting wildlife onto or from Fort Wainwright lands at this time. All proposed introduction or reintroduction of wildlife species will be thoroughly assessed in accordance with the NEPA and associated USFWS requirements to determine the impact on existing flora and fauna and the installation mission.

3.4.3.1.3 Nuisance Fish and Wildlife Control

Under the Migratory Bird Treaty Act (MBTA), it is unlawful “by any means or manner, to pursue, hunt, take, capture or kill” any migratory bird except as permitted by regulation (16 U.S.C. 703-704). Regulation (50 CFR 21.11) prohibits the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted in the implementing regulations. Where the purpose of an installation action is to intentionally and directly take any migratory bird species (e.g., eradicate nuisance birds; clear nesting, adding eggs), the installation must apply for and obtain a depredation, special purpose, or scientific collection and education permit or other regulatory authorization from the USFWS prior to taking action(s) and record any birds purposefully and intentionally taken under the permit and provide an annual report to the USFWS.

Removal of fish and wildlife on Fort Wainwright lands is the responsibility of the Fort Wainwright Pest Control section, in coordination with Military Police Conservation Officers and Environmental Department personnel. Removal of larger game animals is the responsibility of the ADFG in coordination with Military Police Conservation Officers and Environmental Department personnel.

3.4.3.1.4 Invasive Species Management

Executive Order 13112 requires all federal agencies to prevent the introduction of invasive species, to provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species may cause. See section 3.3.6 for Fort Wainwright invasive species management goals.

3.4.3.1.5 Harvest

Fish and wildlife harvest is the most commonly used form of population management. Levels of hunting, trapping, and fishing are forms of outdoor recreation that the ADFG uses to set population goals. Hunting, fishing, and trapping are conducted under regulations promulgated by the ADFG to ensure that the population can be supported by the available habitat as well as be able to sustain recreational demand.

Fort Wainwright manages hunting, trapping, and fishing in terms of training activities, access, dates within ADFG seasons, safety requirements, permit and reporting requirements, and other parameters to avoid conflicts with the military mission and to provide safe, high quality recreational experiences.

3.4.3.1.6 Wildlife Protection and Conflict Avoidance

It is Fort Wainwright's intention to avoid conflicts between military training and wildlife. Fish and wildlife are protected under a number of statutes, such as the Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, State of Alaska fish and game laws, etc. As a result, USARAK Regulation 350-2 prohibits Soldiers from intentionally targeting fish and wildlife when conducting firing activities, and from harassing fish and wildlife during their maneuver activities. The U.S. Air Force is required to shut down exercises in portions of the Oklahoma/Delta Creek Impact Area if large numbers of the Delta caribou herd are calving there. Historically, neither of these animal-military encounters has posed much of a problem to accomplishing the military mission.

Fort Wainwright will minimize activities or operations directly and negatively impacting fish and wildlife during sensitive time periods or seasons. Fort Wainwright will notify the ADFG when Fort Wainwright concludes that the presence of fish and wildlife during these time periods is too low for there to be significant effects from activities or operations. Fort Wainwright will minimize disturbance to bison calving areas on Donnelly Training Area during 15 April –31 May if bison are present. Fort Wainwright will minimize disturbance to bison pre-migration areas 1 July –31 August if bison are present. Fort Wainwright will not conduct indirect fire operations within 2,000 meters of bison in the impact area during any time of the year. Fort Wainwright will not conduct activities or operations within 500 meters of any bison during any time of year to minimize the impacts on bison. Fort Wainwright will minimize activities or operations in Oklahoma Impact Area or Delta Creek Impact Area from 1-31 May for caribou pre-calving, calving, and post-calving if caribou are present in significant numbers. Fort Wainwright will not conduct indirect fire or bombing operations within 8,000 meters of caribou from 1–31 May. Fort Wainwright will limit disturbance in sandhill crane areas each year from 25 April through 15 May, and 1 September through 30 September when sandhill cranes are present. The Army can conduct military activities in these areas if they first consult with ADFG. Fort Wainwright will also limit activities or operations in or near unique or sensitive habitats (wetlands) during time periods or seasons (spring migration, nesting) that are likely to have a significant adverse effect on fish and wildlife. For instance, Fort Wainwright will limit military operations and outdoor recreational activities in high function wetlands from 1 May – 15 July for migratory bird protection during nesting seasons.

National Bald Eagle Management Guidelines have been established for activities around nests. Those that are most appropriate for military use include: (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. For activities that have temporary impacts, such as the use of loud machinery, other activities, use seasonal restrictions. These types of activities can generally be carried out outside of the breeding season without causing disturbance. Suggested buffer distances depend on the size of the project and visibility of the nest. These suggested buffers range from 330 feet to 660 feet depending on project and landscape. No use of water-craft or off-road vehicles with 330 feet of nest. Except for biologists, avoid operating any aircraft within 1,000 feet of the nest. Also avoid blasts or other loud noises within ½ mile of active nests. For assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of an eagle nest, contact the nearest USFWS Field Office.

Vegetation clearing, site preparation, or other construction activities not conducted during military readiness activities that may result in the destruction of active bird nests or nestlings would violate the

Migratory Bird Treaty Act. In and Interior Alaska, USFWS recommended these activities not be conducted during 1 May – 15 July each year. The timing guidelines are not regulations, but are intended as recommendations to help comply with the Migratory Bird Treaty Act. Some species and their nests have additional protections under other federal laws, including those listed under the Endangered Species Act and bald and golden eagles (protected under the Bald and Golden Eagle Protection Act).

Table 3-1. Excerpt from "Recommended Time Periods for Avoiding Vegetation Clearing in Alaska in order to Protect Migratory Birds (from USFWS 2005)".

HABITAT TYPE → REGION ↓	Forest or woodland[1] *(i.e., trees present)*	Shrub or Open *(i.e., shrub cover or marsh, pond, tundra, gravel, or other treeless/ shrubless ground habitat)*	Seabird colonies *(including cliff and burrow colonies)*	Raptor and raven cliffs
Interior *(Includes Fort Wainwright Main Post, Yukon Training Area, Tanana Flats Training Area, Donnelly Training Area, Gerstle River Training Area, and Black Rapids Training Area)*	May 1 – July 15[2]		May 1 – July 20 [5]	April 15 – August 1

Owl species may begin to nest two or more months earlier than other forest birds, and are common breeders in most forested areas of Alaska. You may wish to survey for nesting owls prior to tree-cutting. It is your responsibility to protect active owl nests from destruction.
[2]Canada geese and swan habitat: begin April 20
[3]Storm petrel burrow habitat: April 1 – October 15
[4]Black scoter habitat: through August 10
[5]Seabird colonies in Interior refer to terns and gulls

The Migratory Bird Treaty Act prohibits "take" of migratory birds. However, the Department of Defense has been granted an exemption for military operational readiness activities that allows "unintentional take". This rule authorizes the Department of Defense to take migratory birds associated with military readiness activities, subject to certain limitations and subject to withdrawal of the authorization to ensure consistency with the provisions of the migratory bird treaties. The 2003 National Defense Authorization Act (Pub. L. 107-314, 116 Stat. 2458, Dec. 2, 2002, 16 U.S.C. 703 note) required the Secretary of Defense, in consultation with the Secretary of the Interior, to identify ways to minimize, mitigate, and monitor take of migratory birds during military readiness activities and required the Secretary to prescribe, with the concurrence of the Secretary of Defense, a regulation that exempts such activities from the Migratory Bird Treaty Act's prohibitions against take of migratory birds. This INRMP further clarifies military readiness activities to include (1) air and ground maneuver training, (2) live-fire demolition, direct and indirect fire activities, (3) range construction, range upgrade and range maintenance activities which are required for military operational readiness, and (4) those vegetation management activities which directly support readiness activities and Soldier safety such as prescribed burning and mechanical or hand thinning to reduce fire danger in range training areas.

3.4.3.1.7 Regional Population Management Cooperative Efforts

Fort Wainwright participates in a number of regional cooperative efforts to manage fish and wildlife. Fort Wainwright works cooperatively with ADFG to monitor and manage moose, caribou, sheep, bison, and upland gamebird populations on Fort Wainwright lands. Fort Wainwright supports ADFG efforts to attract birds to Creamers Field Migratory Waterfowl Refuge in Fairbanks and away from the military airfield on Fort Wainwright. This effort supports Fort Wainwright Bird Air Strike Hazard initiatives by farming additional acreage at Creamer's Field to attract problem geese away from the Fort Wainwright airfield. Fort Wainwright participates in the USGS Alaska Landbird Monitoring Program and USGS

Breeding Bird Survey to monitor avian species. Fort Wainwright also partners with University of Alaska Natural Heritage Program to conduct wood frog call counts in the spring.

3.4.3.2 Fish and Wildlife Habitat Management

Habitat management efforts will be accomplished in a manner to conserve and enhance existing flora and fauna consistent with the Army goal to conserve, protect, and sustain biological diversity while supporting the accomplishment of the military mission. Management activities will maintain healthy ecosystems and to restore degraded ecosystems to their historic functions and values. Primary management consideration will be given to indigenous listed, proposed, and candidate species habitats. When habitat enhancement projects affect fish bearing lakes or streams, Fort Wainwright will obtain a fisheries resource permit from ADFG Division of Sport Fish. If the water body is classified as anadromous, Fort Wainwright will conduct a project-specific Essential Fish Habitat Consultation with National Marine Fisheries Service.

3.4.3.2.1 Habitat Enhancement

Habitat enhancement primarily includes the development and improvement of habitat for bison, moose, grouse, furbearers, and small mammals. Some habitat improvement may also be undertaken for fish, waterfowl, and raptors, such as osprey nesting platforms and nesting boxes. Fort Wainwright uses two primary methods of manipulating habitat, prescribed burning and mechanical removal of vegetation. Fort Wainwright also uses herbaceous and woody vegetation plantings in the cantonment area to improve habitat. Streambank rehabilitation projects have also been used on Fort Wainwright to stop siltation and provide habitat for anadromous and resident fish species.

3.4.3.2.2 Habitat Protection

Migratory bird habitat is protected during nesting season by the Migratory Bird Treaty Act. Because it is so difficult to identify birds and bird nests in forests, the USFWS has promulgated guidance that restricts vegetation clearing in Interior Alaska from 1 May to 15 July annually (see Table 3-1 above). In addition, Fort Wainwright has created a number of special interest areas that protect habitat, such as the Tanana Flats Migratory Bird Special Interest Area (see section 3.6.5.1.2). Many of the special interest areas contain high function palustrine or wetland areas that provide habitat for multiple species. Special management controls exist for these areas which exceed the protective measures that apply everywhere else on Fort Wainwright lands. In the past, Fort Wainwright received a five-year Clean Water Act, Section 404 permit that allowed certain types of military maneuver training in low function wetlands while protecting high function wetlands.

3.4.3.3 Outreach

Public involvement is key to Fort Wainwright's commitment to community outreach. Implementation of this public outreach requires keeping the public informed of recreation regulations, providing harvest forms, military maps and other items of interest. Documents pertaining to wildlife and habitat work will be made available on Fort Wainwright's Natural Resources web site (http://www.wainwright.army.mil/env/NR.html). These include:

- Outdoor Recreation Regulation Supplement
- USARTRAK and Recreation Access Permit information
- Environmental documents pertaining to wildlife management, monitoring and habitat creation
- Recreation opportunities available on post
- Maps (including off-limits and restricted areas)
- Contact phone numbers

3.5 Outdoor Recreation Management

Fort Wainwright strives to maintain an interactive relationship with local communities by providing as many opportunities for public access as allowed by current military training, military security, safety and environmental conditions. Listed in this section are specific programs to provide recreation opportunities on Fort Wainwright lands, consistent with the military mission. These programs are directly related to natural resources management and include access, off-road recreational vehicles, hunting, trapping and fishing. Additional information on outdoor recreational management can be found in Appendix E.

3.5.1 Public Access

While the Army has been training Soldiers around the world for more than a century, it also has provided access to quality recreational opportunities for Soldiers, their families, employees, and the general public. If recreational or management activities conflict with military activities, the military mission comes first. Fort Wainwright, however, has shown that these two goals can be met even in the most rigorous and demanding of training environments.

Traditionally, there have been ample opportunities for the public to participate in recreational activities on Fort Wainwright lands. In maintaining a liberal policy of public access, Fort Wainwright relies on a responsible public to adhere to installation policies designed to promote physical security, minimize safety hazards, and protect natural and cultural resources. Access to Fort Wainwright lands for recreation is authorized on specific training areas, and all recreation activities must be conducted in accordance with applicable rules and regulations.

3.5.1.1 Public Access Policy

Civilians and military personnel requesting recreational access to Fort Wainwright's lands and waters must obtain a Recreation Access Permit (RAP card). This permit provides conditional authorization to enter Army training lands and is good for two calendar years. Permits can be obtained online (http://usartrak.isportman.net), at Fort Wainwright and Fort Greely Visitor Centers; Morale, Welfare and Recreation Office at Fort Wainwright; or Environmental Office. After the Recreation Access Permit is obtained and prior to entering Fort Wainwright lands, all recreational users must log in, using the permit number located on the Recreation Access Permit, to the U.S. Army Recreational Tracking System (USARTRAK) to ascertain which training areas are available for recreational use. Individuals are prohibited from entering areas other than those indicated as open on the USARTRAK system. Individuals are also prohibited from entering any of the areas indicated as closed by placard, blockade, verbal warning, red flag or other means of communication. Authorization for access is subject to change based on the current Force Protection Condition levels and mission training requirements.

3.5.1.2 USARTRAK

Fort Wainwright has established the U.S. Army Recreation Tracking (USARTRAK) system to facilitate recreational access onto military lands. All persons (civilian and military) desiring to recreate on Army lands in Alaska must obtain a Recreational Access Permit and must use the USARTRAK system. USARTRAK is an automated access system that allows registered users (RAP card holders) to telephonically or via the web to access range opening data and to check in to areas open to recreation. Updates and improvements are continuing to be developed. The most current recreational information for Fort Wainwright can be found online at: http://www.wainwright.army.mil/env/RecAccess.html.

3.5.1.3 Public Access and Military Land Use

The amount of limitations and restrictions on public use of military lands depends on the type of military use of each area. Military use can be broken down into four general categories that affect access. Public access into training areas is allowed subject to safety restrictions and military security, when access does not impair the military mission, as determined by the Garrison Commander. Public access into firing ranges, surface danger zones, and non-dudded impact areas is normally not allowed due to conflicts with the military mission. However, there are times during the year when public use does not conflict with military training and public access is allowed into these areas. If additional potentially dangerous sites are found, the federal government would close them to public use. Unless explicitly opened by the Army, all military structures are off limits to nonmilitary use. Public access into dudded impact areas is prohibited because of the hazard of unexploded ordnance. When firing occurs into an impact area, the affected portion of the impact area and a two mile buffer adjacent to the affected tract are off limits to all access and use. Public access into urban areas is allowed subject to safety restrictions and military security, when access does not impair the military mission, as determined by the Garrison Commander. All portions of the withdrawal are subject to temporary closures when the military needs them to conduct training and testing. Such closures would be for the minimum areas and periods necessary for the military's exclusive use.

3.5.1.4 Encroachment Policy

Encroachment may be defined as legal activities and land use on or next to a military installation that are incompatible with long-term military mission sustainability and success. Building residences and subdivisions up to the installation boundary can result in conflicts with the public due to noise and dust. Fort Wainwright is committed to working with surrounding landowners to minimize these types of potential conflicts.

Over the last ten years, Fort Wainwright has been inundated with numerous requests and proposals from state, federal, and municipal government agencies, businesses, utilities, clubs, organizations, and individuals for authorization or permission to use Army lands on a long-term basis for nonmilitary purposes. Requests often have included commercial or long-term real estate interests involving rights-of-way, easements, land use permits, leases, outgrants, land transfers, exclusive use areas, and special concessions. It is the position of Fort Wainwright to generally deny requests for nonmilitary uses of Fort Wainwright properties if those requests include or involve a requirement for long-term real estate commitments, such as leases, easements, or land transfers, or if they create a potential adverse impact on the military mission or the environment.

Fort Wainwright has developed an Army Compatible Use Buffer Program (ACUB) to address these encroachment issues. The ACUB program is an integral component of the Army’s sustainability triple bottom line: mission, environment, and community. The program is an innovative tool to address encroachment and achieve conservation objectives by proactively addressing encroachment that causes costly workarounds or compromises training realism. Title 10, Section 2684a of the United States Code authorizes the Department of Defense to partner with non-Federal governments or private organizations to establish buffers around installations. The Army implements this authority through the ACUB program, which is managed jointly at Army Headquarters level by the offices of the Assistant Chief of Staff for Installation Management and the Director of Training.

An ACUB allows an installation to work with partners to encumber land to protect habitat and training without acquiring any new land for Army ownership. Through ACUBs, the Army reaches out to partners to identify mutual objectives of land conservation and to prevent development of critical open areas. The

program allows the Army to contribute funds to the partner's purchase of easements or properties from willing landowners. These partnerships preserve high-value habitat and limit incompatible development in the vicinity of military installations.

3.5.1.4 Trespass

Illegal entry onto Fort Wainwright lands is the most common form of trespass. Most illegal activities either directly or indirectly affect natural resources. Since trespass is often the precursor to most illegal range activity, reducing trespass could also reduce illegal range activity. Crossing the installation boundary or the internal boundary of an off-limits area without approval constitutes trespass. Little of the installation's boundary is fenced or posted with installation boundary signs, which adds to the problem. Most attempts at posting any boundary are often removed or destroyed requiring constant maintenance that is not resource appropriate. However, trespass is often premeditated. Posting the boundary would reduce accidental trespass, but the effect on premeditated trespass would be minimal. Boundary marking can only be effective in concert with enforcement efforts associated with premeditated trespass. Entering Fort Wainwright Lands without obtaining a RAP card and checking in using the USARTRAK system is considered trespass.

3.5.2 Hunting and Trapping Programs

Both hunting and trapping are important natural resources based forms of outdoor recreation on Fort Wainwright lands. In 2012, according the USARTRAK website, users of Fort Wainwright lands logged over 7,281 user days of outdoor recreation on Army lands; hunting and trapping accounted for 80% of the recorded total outdoor recreational usage on Fort Wainwright lands (big game hunting = 61%, small game hunting = 17% and trapping = 2%). Additional information on hunting and trapping programs are in Appendix E, Section E2.2.

3.5.2.1 Hunting and Trapping Management

Hunting and trapping on Fort Wainwright are conducted under regulations promulgated by the ADFG and Game to ensure a sustainable harvest of game and furbearer species. Fort Wainwright manages hunting and trapping in terms of areas available, dates within ADFG seasons, safety requirements, permit and reporting requirements, and other parameters to avoid conflicts with the military mission and provide safe, high quality recreational experiences. Fort Wainwright also may institute hunting and trapping regulations (including season closures or bag limit decreases) that are more restrictive than those promulgated by the ADFG. For this reason, hunters and trappers must consult Army rules and regulations prior to attempting to harvest game on Fort Wainwright lands. Additional restrictions can be found in the Fort Wainwright Recreation Supplement to the USAG-FWA Regulation 190-13.

3.5.2.2 Authority to Hunt, Fish, and Trap

Hunting, fishing, and trapping may be permitted within the current sustainable population levels and carrying capacity of specific wildlife habitats. The number of users of fish and wildlife resources may be limited on a daily or seasonal basis. Membership in an organization, including rod and gun clubs, will not be a prerequisite to obtain permits or authorization to hunt, fish, or trap on Fort Wainwright lands. All hunting, fishing, or trapping on a military installation under the control of the Department of the Army will be in accordance with applicable federal, state, laws and regulations.

There will be no hunting, fishing, or other recreational activities in officially designated and marked impact areas and associated buffer zones. Impact areas that have been permanently or temporarily closed may be opened to hunting and fishing only after approval from the Installation Range and Safety Officers

and the Fort Wainwright Commander. The Range, Safety, and Natural Resources offices will determine recreational use boundaries (pursuant to the INRMP) that are adjacent to impact areas.

3.5.2.3 Permits

3.5.2.3.1 Fort Wainwright Recreation Access Permits

As stated above, all civilians and military personnel who desire to hunt, fish, trap or otherwise recreate on Fort Wainwright lands are required to obtain a Recreation Access Permit. All hunters and trappers on Fort Wainwright lands must also have all required state and federal hunting licenses and stamps and state issued hunter safety cards (when applicable) in possession while hunting or trapping on Fort Wainwright lands. Additional information on requirements to hunt in the state of Alaska can be found on the ADFG web site: http:/www.adfg.alaska.gov/.

3.5.2.3.2 Hunting and Fishing Permit Fees

Almost all military installations issue permits for hunting, fishing, and trapping and most are charging a fee for those permits. Army funding policies are making it almost impossible to fund hunting and fishing programs unless a fee system is installed. Pursuant to16 USC 670a-f and Army Regulation 200-1, the Fort Wainwright Garrison Commander is authorized to collect, spend and administer fees for hunting, fishing, or trapping on Fort Wainwright lands. Such fees are administered in accordance with Army Regulation 200-1 and are used on the installation from which they are collected for the protection, conservation, and management of fish and wildlife, including habitat restoration and improvement, biologist staff and support costs, and related activities, as stipulated in the Fish and Wildlife Cooperative Plan, but for no other purpose.

3.5.2.4 Regulations

Hunting, fishing and trapping on Fort Wainwright lands are regulated by both the State of Alaska, through its hunting and trapping regulations, and the federal government through Army-wide and installation specific regulations. The ADFG issues various regulations that are applicable to hunters and trappers in Alaska on Fort Wainwright lands. These regulations include the Alaska Hunting Regulations, Alaska Trapping Regulations, Migratory Bird Hunting Regulations, and Alaska Sport Fishing Regulation Summary. These regulations describe seasons and bag limits and are updated annually. Army Regulation 200-1, *Environmental Protection and Enhancement*, and USAG-FWA Regulation 190-13, *Conservation Program – Enforcement on Fort Wainwright, Alaska*, are the primary means of establishing additional controls on hunting and trapping as well as other natural resources-related activities on Fort Wainwright. USAG-FWA Regulation 190-13 pertains to hunting, trapping, fishing and off-road recreational vehicle use on Fort Wainwright lands. The Fort Wainwright Recreation Supplement (updated as needed) condense these regulations into a user-friendly format and are distributed to the public

3.5.3 Fishing Program

Fishing on Fort Wainwright is conducted under regulations promulgated by the ADFG and summarized in the Alaska Sport Fishing Regulation Summary to ensure a sustainable harvest of fish species. Fort Wainwright manages fishing in terms of areas available, dates within ADFG seasons, safety requirements, permit and reporting requirements, and other parameters to avoid conflicts with the military mission and to provide safe, high quality recreational experiences. Fort Wainwright staff works with biologist from the ADFG Sport Fish Division to conduct surveys of native fish and to stock lakes on Army lands. Fort Wainwright also may institute fishing regulations (including season closures or creel limit decreases) that are more restrictive than those promulgated by the ADFG. For this reason, anglers must consult Army rules and regulations prior to fishing on Fort Wainwright lands. Additional information of the fisheries program on Fort Wainwright lands can be found in Appendix E, Section E2.3.

3.5.4 Subsistence

Subsistence has been legally defined to include the customary and traditional uses of fish and game in all of Alaska's rural areas. Food is one of the most important subsistence uses of wild resources. However, there are other important uses of subsistence products, such as clothing, fuel, transportation, construction, home goods, sharing, customary trade, ceremony and arts and crafts. All of these uses of wild resources are recognized and protected in law. Subsistence is a rich pattern of living, of which food is but one important part (Wolfe 1989).

Since 1989, laws of the United States and the State of Alaska governing subsistence in Alaska have been in disagreement. Because of this unresolved discrepancy, the State of Alaska and United States governments each maintain separate programs for providing for subsistence on their separate lands and waters within the state. This INRMP does not attempt to solve these discrepancies or differences. Rather, the following section and Appendix E, Section E2.4 (in greater detail) attempt to explain the differences in the federal subsistence program, the state subsistence program, and traditional subsistence and then discuss how those programs apply to Fort Wainwright lands.

All Army lands in Alaska are federal lands. Fort Wainwright consists of mostly public domain land withdrawn for military purposes. Federal regulations do not provide for subsistence priority on lands withdrawn for military use. 50 CFR 100.3(d), published 27 December 2005, in the Federal Register states: (d) The regulations contained in this part apply on all other public lands, other than to the military, U.S. Coast Guard, and Federal Aviation Administration lands that are closed to access by the general public, including all non-navigable waters located on these lands.

While there are no subsistence priorities on military lands for those who qualify under federal or state rules, subsistence users do utilize subsistence resources on military lands. Fort Wainwright is responsible for managing these subsistence resources for all users and the impacts must be assessed. Fort Wainwright lands were also traditionally used for subsistence activities by Alaska Natives and the Army has a trust responsibility to conserve the resources.

3.5.5 Off-Road Recreational Vehicles and Watercraft

Off-road recreational vehicles are used in association with many activities in the Alaskan Interior. These vehicles are used to access hunting, fishing, and trapping areas, for recreational riding and for other activities. Fort Wainwright will maintain opportunities for off-road recreational vehicle use provided it does not conflict with the military mission or adversely affect the environment. The Army is a trustee of public lands and has a responsibility to protect and enhance environmental quality, conserve natural resources, and provide opportunities for outdoor recreation. Nevertheless, the land under Army control was acquired solely for national defense purposes. Other uses are therefore secondary to mission needs.

3.5.5.1 Suitability

To determine the suitability of areas and trails for off-road recreational vehicles, each type of motorized off-road recreational vehicles will be considered separately, taking into account potential environmental impacts, the season of use, and opportunities to balance seasonal use with other recreational uses. If the Garrison Commander, or designee, determines that off-road recreational vehicle use is causing or will cause considerable adverse effects to the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources, the use of the type of off-road recreational vehicle causing such effects will be immediately prohibited. If necessary, designated sites will be closed. Restrictions on off-road recreational vehicle use

or closure of designated sites will remain in effect until such adverse effects have been eliminated, including site restoration if necessary, and appropriate measures implemented to prevent any such recurrence.

The environmental and related impacts of off-road recreational vehicle use will be assessed according to Army Regulation 200-1 and 32 CFR 651. Coordination with adjacent private and public landowners and managers will be included in the assessment process. Coordination must be made to ensure all local, state, and federal requirements are met. Although many off-road recreational vehicle riders use established trails and roads, off-road recreational vehicles have the potential for damage to natural resources. Restrictions for off-road recreation vehicles of Fort Wainwright can be found in the Fort Wainwright Regulation 190-13.

Army lands may be designated for one or more types of off-road recreational vehicle use in response to a demonstrated need, provided that sufficient suitable areas are available. Lands that may not be designated for one or more types of off-road recreational vehicle use are as follows:

- Areas restricted for security or safety purposes, such as explosive ordnance impact areas.
- Areas containing geological and soil conditions, flora or fauna, or other natural characteristics of fragile or unique nature, which would be subject to excessive or irreversible damage by use of off-road recreational vehicles.
- Areas where the use by a type or types of off-road recreational vehicles would cause unequivocal and irreversible damage or destruction as a result of such use, provided, however, that types of off-road recreational vehicles not causing such damage or destruction may be permitted to use such areas.
- Areas that are key fish and wildlife habitats, as identified under environmental consideration.
- Areas that contain archeological sites, historic sites, petroglyphs, pictographs, or areas set aside for their scenic value, and areas in which noise would adversely affect other uses or wildlife resources.
- Areas in or adjacent to outdoor recreation areas where noise or vehicle emissions would be an irritant to users of the outdoor recreation area.
- Noise sensitive areas such as housing, schools, churches, or areas where noise or vehicular emissions would be an irritant to inhabitants.
- Areas or trails set aside for horses and their recreational use.
- Areas where off-road recreational vehicle use would disturb nesting or breeding of wildlife, especially those protected under Endangered Species Act or Migratory Bird Treaty Act.

3.5.5.2 Off-Road Recreational Vehicle and Motorized Watercraft Use on Fort Wainwright Lands

Off-road recreational vehicles have great potential for damage to natural resources. Army policy on off-road recreational vehicles is very restrictive. Fort Wainwright Regulation 190-13 addresses areas open and closed to off-road use on Fort Wainwright lands. Use of privately owned off-road recreational vehicles on Fort Wainwright lands is allowed on a limited basis. No off-road recreational vehicles are allowed to run along the Trans-Alaska Pipeline System's work pad used for maintenance along its line without the permission of Alyeska Pipeline Service Company, BLM, and the District Corps of Engineers. ORVs weighing less than 1,500 pounds may cross the pipeline. ORVs weighing more than 1,500 pounds would need approval to cross the pipeline.

3.5.5.2.1 Land Based Off-Road Recreational Vehicles

Off-road recreational vehicles are defined as motorized vehicles primarily designed for operation on land and other hard surfaces such as frozen lakes and rivers. Off-road recreational vehicles are further divided into two classifications, those with a Gross Vehicle Weight Rating (GVWR) of 1500 lbs. or less, and those over 1500 lbs. Off-road recreational vehicles in excess of 1500 lbs. are prohibited from leaving any improved roadway without a permit. Fort Wainwright Garrison Commander may issue permits for off-road recreational vehicles in excess of 1500 lbs GVWR to enter training lands and travel off improved roads (Fort Wainwright Regulation 190-13). Off-road recreational vehicles include snowmachines, dirt bikes, four-wheelers, swamp buggies, civilian use small unit support vehicles and four-wheel-drive vehicles.

3.5.5.2.2 Motorized Watercraft

Motorized watercraft is defined as watercraft propelled by machinery. This term includes any vessel temporarily or permanently equipped with a motor (e.g. riverboats, airboats, hydrofoils, personal watercraft, and etc).

3.5.5.2.3 Off-Road Recreational Vehicle and Motorized Watercraft Areas

All land and water areas will be closed to recreational use by motorized off-road recreational vehicles except those areas and trails that are determined suitable and specifically designated for such under the procedures established in this Integrated Natural Resources Management Plan and Fort Wainwright Regulation 190-13. In determining suitability of areas and trails for off-road recreational vehicle and motorized watercraft use, each type of motorized vehicle will be considered separately, taking into account its potential environmental impact, the seasonal nature of its use and opportunities for counter-seasonal use with other recreational uses.

Fort Wainwright is managed for a number of different types of public recreational use. All areas that are determined open for recreational use may be closed temporarily during periods of military use. All users must check in through USARTRAK prior to entering Fort Wainwright lands to determine if areas are open to recreational use. Fort Wainwright uses the following classification system to describe recreation areas on the installation.

Off road recreation vehicles with a ground vehicle weight of less than 1500 lbs Gross Vehicle Weight (GVW) can be operated in Open Use Areas and Modified Use Areas. Vehicles greater than 1500 lbs GVW can be operated on improved roads or within open use areas with a special permit issued by the garrison commander. Off road vehicles are not authorized in Limited Use Areas, Special Use Management Areas, or Closed areas. Open Use Areas, Modified Use Areas, Limited Use Areas, Special Use Management Areas and Closed Areas are further defined in section 4.1.5.4 Outdoor Recreation Management.

USAG-FWA Regulation 190-13, and the Fort Wainwright Recreation Supplement, address areas open and closed to off-road recreational vehicle use on Fort Wainwright lands. Maps showing open, modified, limited, closed, and special use management areas are shown in Chapter 4 of this INRMP. Use of privately owned off-road recreational vehicles on post is allowed on a limited basis. The Fort Greely Resource Management Plan (BLM 1994a) restricts off-road recreational vehicle use along the Trans-Alaska Pipeline System right-of-way without permission from Alyeska Pipeline Service Company. Alyeska currently requires recreational users to get Recreational User Group (RUG) pass to access the pipe line corridor. These passes can be obtained from personnel at any of the pump stations or from Alyeska corporate headquarters in Anchorage.

3.5.6 Other Recreational Activities

Fort Wainwright strives to maintain an interactive relationship with local communities by providing many recreational opportunities to the public. Other recreational activities include picnicking, camping, hiking, cross-country skiing, snowshoeing, dog mushing, boating, rafting, and berry picking.

3.5.6.2 Boating and Rafting

All personal use boats and rafts will adhere to Alaska state law for safety and registration requirements on Fort Wainwright properties. There may be restrictions on some water bodies on use of motors or closed seasons due to insufficient water levels and the potential to impact fragile ecosystems. More information can be found in the recreation supplement to the Fort Wainwright 190-13. The current supplement can be found the Fort Wainwright web site at http://www.wainwright.army.mil/env/Outdoor.html.

3.5.7 Recreational Use Monitoring

Fort Wainwright monitors recreational use on its lands to determine ecosystem impacts Monitoring includes field surveys, aerial surveys, and user surveys to determine location, type, duration and frequency of use. Monitoring of training areas also locates trespass structures. Recreational use of military land in Alaska creates impacts on military training lands, primarily a result of legal recreational use and illegal trespass of recreational vehicles. A basic tenet of ecosystem management is the importance of human values and use. Fort Wainwright's outdoor recreation program affects ecosystems in terms of both renewable resources (fish and game species, firewood, etc.) and disturbance associated with recreational use. Fort Wainwright is well aware of the need to ensure these activities do not significantly impact ecosystem integrity. There are a number of elements of the outdoor recreation inventory and monitoring program. Recreational facility inventory, recreational user monitoring, recreational impact monitoring, and trespass structure monitoring and inventory are all components of the outdoor recreation monitoring and inventory program.

3.5.8 Public Outreach

The public outreach program develops informational materials, conducts briefings, attends public meetings and events, and conducts surveys of public desires for natural and cultural resources management on Fort Wainwright lands that will improve public awareness about the diverse and unique natural and cultural resources found on Army lands in Alaska. The goal of the public outreach program is to provide an awareness of recreational opportunities and responsibilities to hunters, trappers, anglers and others who participate in recreational activities on Fort Wainwright lands. More information is available in Appendix E, Section E2.8.

3.5.9 Conservation Enforcement

Many aspects of natural resources management require effective enforcement if they are to be successful. Such features as harvest controls, protection of sensitive areas, pollution prevention, hunting and fishing recreation, non-game protection, and others are dependent upon effective law enforcement. Enforcement of laws primarily aimed at protecting natural and cultural resources, outdoor recreation activities are an integral part of the installation's natural resources management program. Game laws must be implemented in accordance with applicable state and federal laws and as approved by the commander in the INRMP. Whenever hunting, fishing, or trapping is allowed on Army installations, enforcement of natural resources laws and regulations will be in accordance with the installation Fish and Wildlife

Cooperative Plan and will be performed by natural resources law enforcement professionals and/or Provost Marshal if practicable, or as required under the Status of Forces Agreement, outside the continental United States.

The Director of Emergency Services is the senior Fort Wainwright law enforcement official. The director is responsible for coordination and supervision of fish and wildlife law enforcement on all Army lands in Alaska. The Fort Wainwright Chief of Police supervises the Conservation Enforcement program. They also coordinate and receive technical direction from the Chief of Natural Resources in accordance with Army Regulation 200-1 and USAG FWA Regulation 190-13.

Fort Wainwright lands have concurrent jurisdiction. Conservation enforcement can be performed by officers with federal or state commissions. Enforcement is a joint responsibility of Fort Wainwright, USFWS, the Alaska Department of Public Safety (State Troopers), and BLM. ADFG employees are also deputized to enforce fish and game regulations. Citations written by Fort Wainwright personnel are adjudicated by the Federal Magistrate, whereas citations issued by Alaska State Troopers go through the state system for adjudication. The Directorate of Public Works; Directorate of Community Activities, Directorate of Emergency Services, BLM, USFWS, and ADFG all have responsibilities here.

There are five components of the Fort Wainwright conservation enforcement program which include enforcing conservation laws, reducing theft and vandalism, interacting with the public, enforcing trespass, and conservation officer training.

Enforcement of laws primarily aimed at protecting wildlife and other natural resources is an integral part of the installation's natural resources management program. Conservation enforcement on Fort Wainwright includes enforcement of all natural resource related and environmental laws, enforcement of trespass, interaction with the public, and conservation enforcement officer training. Effective law enforcement is critical to natural resources conservation and the continuance of hunting, trapping, and fishing programs on a sustained basis. Trespass is often the first step to most illegal range activity and reducing illegal trespass could also reduce illegal range activity. Conducting conservation enforcement is required by Public Law 86-797 (Sikes Act) to implement the INRMP.

During the fall hunting season, Fort Wainwright personnel use flights to monitor any trespass within the impact areas and other restricted areas on post. Fort Wainwright conservation officers also contact individuals and groups of people that are hunting in areas that are closed for training. Conservation officers play a key role during the hunting season as they are the only members of the Fort Wainwright Law Enforcement community that is familiar with the training areas. Fort Wainwright has trespassers every year in training areas that were closed for training events. All training activities must cease until the trespasser has been removed. The most likely time to have trespass issues is during the hunting season (Aug 10 - Apr 31), however trespass does occur at all times of the year. When a quick response is needed to remove trespassers from areas closed for training the conservation officers are the only ones that can respond in a timely manner.

Crossing the installation boundary or the internal boundary of an off-limits area without approval constitutes trespass. Trespass is the most frequent infraction occurring on military installations, which is often the precursor to other illegal activities. Simply crossing the boundary without approval constitutes this action.

Theft of military ordnance (both unexploded and debris) and other items is an important issue with the Federal Bureau of Investigation and other enforcement agencies. These agencies work with military installations where this is a serious problem. People who enter Fort Wainwright lands and other

installations to steal military ordnance and other items are called “scrappers.” This issue is not thought to be as serious at Fort Wainwright as it is at some other installations in the nation.

Timber and cultural resources are real property and the responsibility of Fort Wainwright to protect these resources. Timber theft is an activity that is increasing on Fort Wainwright lands. Theft of timber resources changes the characteristics of training areas and negatively impacts military training. Cultural artifacts have value both for personal enjoyment and commercial sale. Protection of timber and cultural resources is directly related to the control of trespassers.

In many cases, conservation officers are the primary contact between Fort Wainwright natural resource management and the public. This is a very important role for the conservation officers to play, because they represent not only the conservation program but also all of Fort Wainwright. These contacts are an excellent opportunity for Fort Wainwright to accomplish public outreach, awareness, and education.

Army Regulation 200-1 and the Sikes Act require effective natural resources law enforcement on military installations. There are requirements that this enforcement be closely coordinated with the natural resources organization and that enforcement be accomplished by professionally trained conservation enforcement personnel. A generally recognized requirement exists for a Land Management Police Training course through the Federal Law Enforcement Training Center (or equivalent natural resources training) and an additional 40-hour-minimum annual refresher training for enforcement officers.

3.6 Rare, Threatened and Endangered Species Management

There are no known federally endangered or threatened species on Fort Wainwright lands; therefore, management focuses on rare, uncommon, and priority species as well as species of concern. Rare, threatened and endangered species monitoring contributes to our natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. The Fort Wainwright Ecosystem Management Plan (Appendix G) identifies management of these species in detail including management guidelines and implications for department and military training.

It is an important goal of the Fort Wainwright natural resources program to take proactive approaches, develop rigorous strategies and create adaptive management based programs to minimize the potential for Fort Wainwright species to become threatened or endangered. The Fort Wainwright Ecosystem Management Program identifies rare, uncommon priority management species, species of concern, and species at risk. The Fish and Wildlife Management program, Invasive Species Management program and Special Interest Areas Management program help to ensure continued effective management on Fort Wainwright lands in Alaska for years to come. The programs mentioned above and their associated plans, as well as the information in this plan, encompass these principles and provide a solid framework for rare, threatened and endangered species management on Fort Wainwright lands.

There are no known federally endangered or threatened species on Fort Wainwright lands; therefore, management focuses on rare, uncommon, and special status species. Rare, threatened and endangered species monitoring contributes to our natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. The Ecosystem Management Plan (Appendix G) identifies management of these species in detail including management guidelines and implications for department and military training.

It is an important goal of the Fort Wainwright Natural Resources Program to take proactive approaches, develop rigorous strategies, and create adaptive management based programs to minimize potential for Fort Wainwright species to become threatened or endangered. The Fort Wainwright Ecosystem

Management Program evaluates other agencies' conservation plans, strategies, and special status species lists.

Species of concern (Endangered Species Act definition) is an informal term referring to a species that might be in need of conservation action. This may range from a need for periodic monitoring of populations and threats to the species and its habitat, to the necessity for listing as threatened or endangered. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing. A similar term is "species at risk," which is a general term for listed species as well as unlisted ones that are declining in population. Canada uses the term in its new "Species at Risk Act." "Imperiled species" is another general term for listed as well as unlisted species that are declining

The Fish and Wildlife Management program, Invasive Species Management program and Special Interest Areas Management program help to ensure continued effective management on Fort Wainwright lands in Alaska for years to come. The programs mentioned above and their associated plans, as well as the information in this plan, encompass these principles and provide a solid framework for rare, threatened and endangered species management on Fort Wainwright lands.

3.6.1 Threatened and Endangered Species

An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. There are currently no federally threatened or endangered species on Fort Wainwright lands.

3.6.2 Special Status Species

Although there are no threatened or endangered species found on Fort Wainwright lands, there are a number of other special status species that require monitoring and management.

3.6.2.1 Candidate Species and Species at Risk

Species that are candidates for federal listing as threatened or endangered are not protected under the Endangered Species Act. Fort Wainwright will consider decisions that may affect candidate species, as they may be listed in the future. Fort Wainwright will avoid taking actions that result in the need to list candidate species as threatened or endangered. Installations are encouraged to develop Endangered Species Management Component Plans for candidate species and to participate in conservation agreements with the U.S. Fish and Wildlife Service. Affirmative action to conserve candidate species can preclude the need to list such species. At a minimum, installations will document the distribution of candidate species on the installation and monitor their listing status. Fort Wainwright will strive to understand the status of candidate species across the installation through inventory and monitoring, research, and management.

Species of concern (Endangered Species Act definition) is an informal term referring to a species that might be in need of conservation action. This may range from a need for periodic monitoring of populations and threats to the species and its habitat, to the necessity for listing as threatened or endangered. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing. A similar term is "species at risk," which is a general term for listed species as well as unlisted ones that are declining in population. Canada uses the term in its new "Species at Risk Act." "Imperiled species" is another general term for listed as well as unlisted species that are declining

The Army's policy is to proactively manage species at risk in order to prevent critical habitat designations associated with Endangered Species Act listing that could severely degrade military readiness. Army species at risk are official candidates for Endangered Species Act listing, classified by NatureServe as critically imperiled or imperiled on a global scale, and/or a concern for ESA listing in the foreseeable future. There are three species at risk on Fort Wainwright lands. They are the Alaska starwort (*Stellaria alaskana*), G3; Tanana locoweed *Oxytropis tananensis*, G2G3; and the Rusty blackbird (*Euphagus carolinus)*, G4. Managing species of concern is a critical requirement. Fort Wainwright must prioritize species at risk management requirements within allocated resources to ensure that species of concern requirements are adequately addressed. The objective of the Army species at risk initiative is to focus conservation efforts on species at installations that have an Army-wide strategic and enduring mission capability and where there are indications that the listing of a species at risk may be imminent due to population declines.

3.6.2.2 State-Listed Species

Army installations must be sensitive to those species listed as endangered or threatened under state law. There are no state-listed species on Fort Wainwright Lands. Whenever feasible, installations should cooperate with state authorities in efforts to conserve these species. The Alaska Watchlist, compiled by Audubon Alaska and updated in 2010, highlights bird species at risk. The State of Alaska Wildlife Action Plan, developed by ADFG in 2005, highlights species with special conservation needs. As of August 15, 2011, ADFG no longer maintains a Species of Special Concern list. The list had not been reviewed and revised since 1998 and was out of date and no longer considered valid. Currently, ADFG uses the Wildlife Action Plan, which is supported through the State Wildlife Grant program, ADFG to assess the needs of species with conservation concerns, and to prioritize conservation actions and research. See the Wildlife Action Plan to view the species-focused plan.

3.6.2.3 Other Status Fauna

Nineteen species confirmed on Fort Wainwright lands are included on the Boreal Partners in Flight *Priority Species of Conservation* list for monitoring because of declines in populations noted across the Americas (Table 1).

Six species confirmed on Fort Wainwright lands are listed on the Bureau of Land Management (BLM) Sensitive Species List for Alaska, produced in 2005 and revised in 2011 (Tab 1). There are no legal requirements to manage these species although all migratory bird species are afforded some protection under the Migratory Bird Treaty Act (Ruth Gronquist, Bureau of Land Management, personal communication).

The U.S. Fish and Wildlife Service (USFWS), Division of Migratory Bird Management, maintains a list of *Birds of Conservation Concern* for each bird conservation region, updated in 2011. There are ten species listed for this ecoregion (BCR 4 Northwestern Interior Forest, Alaska) that have been documented on Fort Wainwright (Table 1).

Department of Defense (DOD) maintains an interagency bird list that is a compilation of eight species of concern lists: USFWS Division of Migratory Bird Management Birds of Conservation and Management Concern, Non-migratory Bird Species of Concern, USFWS North American Waterfowl Management Plan, USGS North American Waterbird Conservation Plan, USFWS Shorebird Conservation Plan, Partners in Flight (Rocky Mountain Bird Observatory), and USFWS Threatened and Endangered Species (50 CFR 17.11).

Drawing from these lists, DOD Partner in Flight developed a Mission Sensitive Priority Bird Species List published in August of 2012. The DoD Partners in Flight Program has identified nearly 100 bird species that occur on DoD lands and are at risk of becoming listed as threatened or endangered under the federal Endangered Species Act if current population trends continue. The purpose of this list is to help DoD resource managers better prioritize monitoring and management efforts on those species (and their habitats) having the highest potential to impact the military mission should they become federally listed. A secondary focus was on those species with significant conservation concern on DoD lands.

To determine what migratory bird species are of highest "concern" to the Department of Defense, each DoD Partners in Flight Working Group member was tasked in 2008 with providing a list of their "Top 10" species of concern within their area of responsibility (exclusive of federally listed species). DoD representatives from all regions (Southeast, Northeast, Midwest, West, Alaska, and Hawaii), representing all military service branches, provided the initial input. Installation managers on Oah'u, Kauai'i and Hawai'i were queried for Hawaiian priority species. After two annual meetings of the DoD Partners in Flight Working Group and numerous reviewed iterations of the list, a final list was generated for use as a baseline for making better decisions about how to focus future DoD avian monitoring efforts. All bird species on the USFWS 2010 Candidate Notice of Review list known to occur on DoD lands are included. In addition to helping prioritize monitoring programs and National Environmental Policy Act (NEPA) documents, the final list will be used as a basis to evaluate proposals for funding from the Legacy Resource Management Program and guide the development of conservation measures to support Executive Order 13186 (*Responsibilities of Federal Agencies To Protect Migratory Birds*), the associated Memorandum of Understanding, and the Final Migratory Bird ("Readiness") Rule. BirdLife Caribbean also reviewed the list and identified Important Bird Areas in the Caribbean where these species over-winter. Of the species on this list six occur on Fort Wainwright Lands see Table 3-2.

Table 3-2. Species of concern as identified by Partners in Flight, BLM, USFWS (USFWS), and Department of Defense (DOD) and found on Fort Wainwright, Alaska, 2013.

Common Name	Scientific Name	Boreal Partners in Flight *Priority Species of Conservation*	BLM *Alaska Sensitive Animal List*	DOD Partners in Flight *Mission Sensitive Priority List*	USFWS Division of Migratory Bird Management *Birds of Conservation Concern*
Horned Grebe	*Podiceps auritus*				X
Trumpeter swan	*Cygnus buccinator*		X	X[1]	
Greater Scaup	*Aythya marila*			X[2]	
American Widgeon	*Anas Americana*			X[2]	
Golden Eagle	*Aquila chrysaetos*		X		
Peregrine Falcon	*Falco peregrines*				X
Gyrfalcon	*Falco rusticolus*	X		X[1]	
Northern goshawk	*Accipiter gentilis*			X[2]	
Sharp-tailed Grouse	*Tympanuchus phasianellus*	X			
White-tailed Ptarmigan	*Lagopus leucurus*	X			
Whimbrel	*Numenius phaeopus*				X
Lesser Yellowlegs	*Tringa flavipes*			X[3]	X
Upland Sandpiper	*Bartramia longicauda*				X

Common Name	Scientific Name	Boreal Partners in Flight *Priority Species of Conservation*	BLM *Alaska Sensitive Animal List*	DOD Partners in Flight *Mission Sensitive Priority List*	USFWS Division of Migratory Bird Management *Birds of Conservation Concern*
Solitary Sandpiper	*Tringa solitaria*			X[2]	X
Spotted Sandpiper	*Actitis macularia*			X[3]	
Great grey owl	*Strix nebulosa*	X			
Boreal owl	*Aegolius funereus*	X		X[2]	
Short-eared Owl	*Asio flammeus*		X	X[2]	
Northern Hawk Owl	*Surnia ulula*			X[1]	
Black-backed woodpecker	*Picoides arcticus*	X		X[1]	
Three-toed Woodpecker	*Picoides tridactylus*			X[2]	
American Dipper	*Cinclus mexicanus*	X			
Northern shrike	*Lanius excubitor*	X		X[2]	
Rusty Blackbird	*Euphagus carolinus*	X	X		X
Bank Swallow	*Riparia riparia*			X[3]	
Boreal Chickadee	*Poecile hudsonica*			X[3]	
Varied Thrush	*Ixoreus naevius*	X		X[2]	
Gray-cheeked Thrush	*Catharus minimus*	X		X[2]	
Swainson's Thrush	*Catharus ustulatus*			X[2]	
Alder Flycatcher	*Empidonax alnorum*			X[2]	
Hammond's Flycatcher	*Empidonax hammondi*	X		X[1]	
Olive-sided Flycatcher	*Contopus cooperi*	X	X	X[2]	X
Gray Jay	*Perisoreus Canadensis*			X[3]	
Blackpoll Warbler	*Dendroica striata*	X	X	X[1]	
Townsend's Warbler	*Dendroica townsendi*	X			
Wilson's Warbler	*Wilsonia pusilla*			X[3]	
Northern Waterthrush	*Seiurus noveboracensis*			X[3]	
White-crowned Sparrow	*Zonotrichia leucophrys*			X[3]	
Golden-crowned Sparrow	*Zonotrichia atricapilla*	X			
Dark-eyed Junco	*Junco hyemalis*			X[3]	
Smith's Longspur	*Calcarius pictus*	X		X[1]	X
Bohemian Waxwing	*Bombycilla garrulus*	X			
Pine Grosbeak	*Pinicola enucleator*			X[2]	
Gray-crowned Rosy Finch	*Leucosticte tephrocotis*			X[2]	
White-winged Crossbill	*Loxia leucoptera*	X		X[3]	

[1] DOD Partners in Flight (High Overall Priority)
[2] DOD Partners in Flight (High Regional Priority)
[3] DOD Partners in Flight (Additional Watchlist Species)

The continental little brown bat (*Myotis lucifugus*), is being imperiled by white-nose syndrome (*Geomyces destructans*). Little brown bats have been reported on Fort Wainwright associated with anthropogenic structures. In Alaska, very little is known about bats including where they occur and how long they have been here, which is particularly true for Interior Alaska and Fort Wainwright. Baseline information about habitat and distribution is needed to evaluate how pervasive declines from white-nose syndrome in the lower 48 may be affecting Alaska bats. Fort Wainwright will consider proactive approaches to investigate bat ecology in the event that little brown bats are evaluated as a candidate for ESA listing. Avoiding inappropriate critical habitat designations for endangered species is of particular interest to military training activities. First needed is basic information to guide the research necessary for circumventing blanket assumptions about bat ecology, in the interest of neither bats nor the Army.

3.6.2.4 Fort Wainwright's Species of Concern and Priority Management Species

Comprehensive management of species at risk, priority species and species of concern on Fort Wainwright lands began in 2000 with the inception of the Fort Wainwright Ecosystem Management program (Schick 2003). Planning for the program was initiated in 1999 and implementation started in 2002, coinciding with the implementation of the Integrated Natural Resources Management Plan (USARAK 2001). The Ecosystem Management Plan is broadly-based and relies heavily on the principles of both conservation biology (Soule 1986) and landscape ecology (Forman 1995). The program follows guidance for effective ecosystem management described in Grumbine (1994), Noss and Cooperrider (1994), Kohm et al. (1996), Yaffee et al. (1996), Leslie et al. (1996), and Boyce and Haney (1997). The concept of managing complete ecosystems is a relatively new approach to land management and is largely a response to the recognition that single-species management and local scale conservation efforts often do not serve to support the processes that keep larger ecosystems functioning. With a broader, ecosystem approach to management, both the spatial and ecological scale of management efforts are greatly expanded so that management is conducted for many species over much larger geographic regions, including species at risk. Ecosystem management also recognizes that humans have been and will continue to be part of the landscape, and it endeavors to integrate human and non-human uses of the land. Importantly, ecosystem management seeks to place management actions within a larger landscape context, specifically recognizing that the effects of actions at a local scale, for example, can have larger ramifications at a landscape scale (Schick 2003).

In preparation for this INRMP revision, in 2011-12, select members of the Fort Wainwright Ecosystem Management Team revamped the Installation's Species of Concern and Priority Management Species lists. All of the above mentioned lists and numerous others were utilized and ranking criteria were developed specific to military lands. This enabled quantifiable results for each species that occurs on Fort Wainwright lands.

Priority management species (Ecosystem Management definition) are species that are politically sensitive in nature. These species, regardless of populations, must be addressed in planning documents and during project development.

Species of concern (Ecosystem Management definition) are species often defined on lists of other agencies or within the scientific community as species at risk because of population declines or threats to their habitat.

Table 3-3. Fort Wainwright Priority Management Species.

Common Name	Scientific Name

Moose	*Alces alces*
Caribou	*Rangifer tarandus granti*
Bison	*Bison bison bison*
Dall Sheep	*Ovis dalli dalli*
Black Bear	*Ursus americanus*
Brown Bear	*Ursus arctos*
Wolf	*Canis lupus*
Wolverine	*Gulo gulo*
Lynx	*Lynx canadensis*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Ruffed Grouse	*Bonasa umbellus*
Spruce Grouse	*Falcipennis canadensis*
Willow Ptarmigan	*Lagopus lagopus*
Rock Ptarmigan	*Lagopus muta*
White-tailed Ptarmigan	*Lagopus leucura*
Bald Eagle	*Haliaeetus leucocephalus*
Golden Eagle	*Aquila chrysaetos*
Trumpeter Swan	*Cygnus buccinator*
Sandhill Crane	*Grus canadensis*
Peregrine Falcon	*Falco peregrines*
Arctic Grayling	*Thymallus arcticus*
King Salmon	*Oncorhynchus tshawytscha*
Coho Salmon	*Oncorhynchus kisutch*
Chum Salmon	*Oncorhynchus keta*

Table 3-4. Fort Wainwright Species of Concern by Training Area in Order of Priority.

Donnelly East	
Olive-sided Flycatcher[1]	*Contopus cooperi*
Rusty Blackbird[2]	*Euphagus carolinus*
Lesser Yellowlegs[2]	*Tringa flavipes*
Wilson's Snipe[2]	*Gallinago delicata*
Upland Sandpiper[3]	*Bartramia longicauda*
Solitary Sandpiper[3]	*Tringa solitaria*
Varied Thrush[3]	*Ixoreus naevius*
Whimbrel[3]	*Numenius phaeopus*
Little Brown Bat[4]	*Myotis lucifugus*
Blackpoll Warbler[4]	*Dendroica striata*
Wilson's Warbler[4]	*Wilsonia pusilla*
Greater Scaup[4]	*Aythya marila*
Lesser Scaup[4]	*Aythya affinis*

Northern Waterthrush[4]	*Seiurus noveboracensis*
Townsend's Warbler[4]	*Dendroica townsendi*
Western Wood-Pewee[5]	*Contopus sordidulus*
Great Gray Owl[5]	*Strix nebulosa*
White-winged Crossbill[5]	*Loxia leucoptera*
Donnelly West	
Olive-sided Flycatcher[1]	*Contopus cooperi*
American Golden plover[2]	*Pluvialis dominica*
Lesser Yellowlegs[2]	*Tringa flavipes*
Wilson's Snipe[2]	*Gallinago delicata*
Rusty Blackbird[2]	*Euphagus carolinus*
Upland Sandpiper[3]	*Bartramia longicauda*
Solitary Sandpiper[3]	*Tringa solitaria*
Varied Thrush[3]	*Ixoreus naevius*
Whimbrel[3]	*Numenius phaeopus*
Little Brown Bat[4]	*Myotis lucifugus*
Blackpoll Warbler[4]	*Dendroica striata*
Least Sandpiper[4]	*Tringa melanoleuca*
Wilson's Warbler[4]	*Wilsonia pusilla*
Greater Scaup[4]	*Aythya marila*
Lesser Scaup[4]	*Aythya affinis*
Northern Waterthrush[4]	*Seiurus noveboracensis*
Gyrfalcon[4]	*Falco rusticolus*
Townsend's Warbler[4]	*Dendroica townsendi*
Surfbird[5]	*Aphriza virgata*
Western Wood-Pewee[5]	*Contopus sordidulus*
Great Gray Owl[5]	*Strix nebulosa*
White-winged Crossbill[5]	*Loxia leucoptera*
Gerstle River	
Olive-sided Flycatcher[1]	*Contopus cooperi*
Lesser Yellowlegs[2]	*Tringa flavipes*
Wilson's Snipe[2]	*Gallinago delicata*
Rusty Blackbird[2]	*Euphagus carolinus*
Upland Sandpiper[3]	*Bartramia longicauda*
Solitary Sandpiper[3]	*Tringa solitaria*
Varied Thrush[3]	*Ixoreus naevius*
Little Brown Bat[4]	*Myotis lucifugus*
Blackpoll Warbler[4]	*Dendroica striata*
Wilson's Warbler[4]	*Wilsonia pusilla*
Greater Scaup[4]	*Aythya marila*

Lesser Scaup[4]	*Aythya affinis*
Northern Waterthrush[4]	*Seiurus noveboracensis*
Townsend's Warbler[4]	*Dendroica townsendi*
White-winged Crossbill[5]	*Loxia leucoptera*
Black Rapids and Whistler Creek	
Wilson's Snipe[2]	*Tringa flavipes*
Upland Sandpiper[3]	*Bartramia longicauda*
Varied Thrush[3]	*Ixoreus naevius*
Blackpoll Warbler[4]	*Dendroica striata*
Wilson's Warbler[4]	*Wilsonia pusilla*
Gyrfalcon[4]	*Falco rusticolus*
White-winged Crossbill[5]	*Loxia leucoptera*
Tanana Flats	
Olive-sided Flycatcher[1]	*Contopus cooperi*
Lesser Yellowlegs[2]	*Tringa flavipes*
Wilson's Snipe[2]	*Gallinago delicata*
Rusty Blackbird[2]	*Euphagus carolinus*
Solitary Sandpiper[3]	*Tringa solitaria*
Varied Thrush[3]	*Ixoreus naevius*
Little Brown Bat[4]	*Myotis lucifugus*
Blackpoll Warbler[4]	*Dendroica striata*
Wilson's Warbler[4]	*Wilsonia pusilla*
Greater Scaup[4]	*Aythya marila*
Lesser Scaup[4]	*Aythya affinis*
Northern Waterthrush[4]	*Seiurus noveboracensis*
Townsend's Warbler[4]	*Dendroica townsendi*
Western Wood-Pewee[5]	*Contopus sordidulus*
Great Gray Owl[5]	*Strix nebulosa*
White-winged Crossbill[5]	*Loxia leucoptera*
Yukon	
Olive-sided Flycatcher[1]	*Contopus cooperi*
Lesser Yellowlegs[2]	*Tringa flavipes*
Wilson's Snipe[2]	*Gallinago delicata*
Rusty Blackbird[2]	*Euphagus carolinus*
Upland Sandpiper[3]	*Bartramia longicauda*
Solitary Sandpiper[3]	*Tringa solitaria*
Varied Thrush[3]	*Ixoreus naevius*
Little Brown Bat[4]	*Myotis lucifugus*
Blackpoll Warbler[4]	*Dendroica striata*
Wilson's Warbler[4]	*Wilsonia pusilla*

Greater Scaup[4]	*Aythya marila*
Lesser Scaup[4]	*Aythya affinis*
Northern Waterthrush[4]	*Seiurus noveboracensis*
Townsend's Warbler[4]	*Dendroica townsendi*
Western Wood-Pewee[5]	*Contopus sordidulus*
Great Gray Owl[5]	*Strix nebulosa*
White-winged Crossbill[5]	*Loxia leucoptera*
Main Post	
Olive-sided Flycatcher[1]	*Contopus cooperi*
Lesser Yellowlegs[2]	*Tringa flavipes*
Wilson's Snipe[2]	*Gallinago delicata*
Rusty Blackbird[2]	*Euphagus carolinus*
Solitary Sandpiper[3]	*Tringa solitaria*
Varied Thrush[3]	*Ixoreus naevius*
Little Brown Bat[4]	*Myotis lucifugus*
Blackpoll Warbler[4]	*Dendroica striata*
Wilson's Warbler[4]	*Wilsonia pusilla*
Greater Scaup[4]	*Aythya marila*
Lesser Scaup[4]	*Aythya affinis*
Northern Waterthrush[4]	*Seiurus noveboracensis*
Townsend's Warbler[4]	*Dendroica townsendi*
Western Wood-Pewee[5]	*Contopus sordidulus*
Great Gray Owl[5]	*Strix nebulosa*
White-winged Crossbill[5]	*Loxia leucoptera*

*Corresponding superscript numbers indicate equal ranking.

Management of specific fish and wildlife species is covered in the Ecosystem Management Plan as well as this Integrated Natural Resources Management Plan, Appendix D. The management of special interest areas is covered under Appendix F, Section F2.3. The complete process and criteria for creating the FWA SOC and PMS lists are described in Appendix D.

3.6.2.5 Special Status Flora

A comprehensive survey of rare plants was included as part of the floristic inventory for Fort Wainwright conducted in 1995. Rare plant surveys were also included in a floristic inventory for Donnelly Training Area conducted in 1996, 1997, and 1998. There are 16 vascular plant species of concern that are known to occur on Fort Wainwright. These plants are being tracked by the Alaska Natural Heritage Program because they are thought to be uncommon or rare in Alaska and/or uncommon or rare globally (Alaska Natural Heritage Program 2006). Eighteen species collected during a floristic inventory of Donnelly Training Area (Racine et al. 2001) were vascular plants being tracked by the Alaska Natural Heritage Program's Biological Conservation Database for interior Alaska. Rare plant surveys have been conducted on Donnelly Training Area since the floristic inventory to update knowledge of species distribution, habitat association and population status (Mason 2006). All additional surveys have been on Donnelly Training Area East and focused on species occurring in habitats on or near the road system. The Donnelly

Training Area Range and Training Land Assessment program also maintains records of rare plants located during impact assessment and vegetation monitoring. A detailed Geographic Information System database of rare plant locations has been created. Species status on Donnelly Training Area has been assessed and is used in the ecosystem management program to help guide land use planning and rare species conservation. Rare and sensitive plants found on Fort Wainwright and Donnelly Training Area can be found in Appendix F, Section F2.2.1.4.

3.6.3 Rare, Threatened and Endangered Species Monitoring

Rare, threatened and endangered species monitoring on Fort Wainwright lands entails monitoring avian, mammalian, amphibian and plant species and protecting sensitive habitat. Because there are no known federally endangered or threatened species on Fort Wainwright lands monitoring involves conducting surveys and protecting, conserving, and enhancing habitat for rare, uncommon, or priority species.

The Alaska Natural Heritage Program's Plant Tracking Database is used to guide efforts to conserve uncommon plant taxa, and the National and Boreal Partners in Flight Program's listings of conservation priority species are used for uncommon or declining bird species. The ADFG has developed a wildlife action plan to address management plans for species of concern by the state of Alaska. The University of Alaska Fairbanks Museum is also developing a list of mammal species of concern for Alaska (Jarrel, personal communication).

Monitoring is accomplished through the Ecosystem Management Plan, flora and fauna planning level surveys, Range and Training Land Assessment surveys, aerial monitoring and other monitoring programs. Rare, uncommon, or priority species and their habitats found on Fort Wainwright lands are identified and delineated through these planning level surveys and monitoring efforts.

3.6.4 Priorities for Rare, Threatened and Endangered Species Management

The determination of which species to manage on Fort Wainwright lands was not done in any systematic way until the Ecosystem Management Plan was implemented in 2002. Prior to the Ecosystem Management Plan, species were selected primarily based on input from federal and state management agencies (e.g., USFWS and ADFG), or in the case of moose and caribou, because of their status as large and economically important game species. Under the Ecosystem Management Plan, a protocol was established to determine whether or not a species should be managed based on considerations generated from an ecosystem approach to management, and in addition, a priority ranking system was created to determine which species, of those selected, are most important for management.

3.6.5 Special Interest Areas

Designation of special protection status for important or fragile natural areas is an effective management tool. In accordance with Army Regulation 200-1, areas that contain natural resources that warrant special conservation efforts will be identified during the inventory and classification process. After appropriate study and coordination, such areas may be managed as "special interest areas" for their unique features. Per Army Regulation 200-1, this Integrated Natural Resources Management Plan "will address the special management necessary for these areas, and all current and future land-uses will consider the uniqueness of these areas and plan accordingly to ensure conservation of their resources."

Designation of special protection status for sensitive or fragile areas is an important management tool. It is easier and more cost effective to place restrictions on the use of some areas, to minimize damage or disturbance, than to repair damage or disturbance after it has occurred. Special interest area management

includes protecting special interest areas through regulations, map overlays showing restrictions, and actual barriers. USARAK Regulation 350-2, *Range Regulation*, has many general provisions to protect environmental resources, including special interest areas.

Military mission-related restrictions within special interest areas are included in the environmental limitations overlay map and environmental awareness materials prepared for distribution to military units who use training areas. Most military mission-related restrictions involving special interest areas have been in place for some time with no significant adverse impacts on accomplishment of the mission. Physical barriers can be used to protect special interest areas. However, this is only used in extreme cases because barriers tend to draw attention to an area.

3.6.5.1 Fort Wainwright

Fort Wainwright has several areas with special natural features. They harbor sensitive or unique wildlife species or represent unique plant communities. The following are special interest area categories with accompanying restrictions.

3.6.5.1.1 Wood River and Clear Creek Buttes

Buttes near Blair Lakes and along the Wood River have cultural and ecological significance. Many of these buttes have cleared helicopter pads for military training, especially since they are on high, relatively dry ground. These buttes will be placed off-limits to ground and vegetation-disturbing activities with exception of existing helicopter pads. This restriction should not impact military training since most missions on buttes require vegetative cover for concealment.

3.6.5.1.2 Tanana Flats Migratory Bird Special Interest Area

The area between Crooked Creek and Willow Creek in the Tanana Flats Training Area harbors undisturbed fen wetlands and significant migratory bird nesting areas. No recreational activities are permitted in this area during 1 May through 15 July annually. This area presently has no trails and no new trails may be developed in this area.

3.6.5.2 Donnelly Training Area

Donnelly Training Area has several areas with special natural features. They harbor sensitive or unique wildlife species or represent unique plant communities. The following are special interest area categories with accompanying restrictions.

3.6.5.2.1 Delta Bison Area

A 1980 cooperative agreement (Bonito 1980) designated areas on Donnelly Training Area as important bison calving and summer range. The 1980 agreement also identified the East Training Area as important late summer and early winter range. An agreement in 1986 with the ADFG (U.S. Army 1986) also identified bison calving and summer range. Fort Wainwright has imposed restrictions to limit disturbance to bison habitat areas from mid February to early September when bison are present.

3.6.5.2.2 Sandhill Crane Roosting Area

The *Alaska Army Lands Withdrawal Renewal Final Legislative Environmental Impact Statement* (USARAK 1998) identified several areas along the Delta River on Donnelly Training Area as important for migrating sandhill cranes. Additional consultation with ADFG identified additional areas along Delta Creek near the Delta Creek Assault Landing Strip as important for migrating sandhill cranes. The Army agreed to limit disturbance in designated sandhill crane areas each year from 25 April through 15 May, and 1 September through 30 September when sandhill cranes are present. The Army can conduct military activities in these areas if it first consults with the ADFG. Survey data collected between the dates of 25

April and 15 May during the years of 2005 – 2012 have resulted in 0 observations of sandhill cranes roosting on the Delta River however observations in September show continued significant use.

3.6.5.2.3 Delta Caribou Calving and Post-Calving Areas

The *Alaska Army Lands Withdrawal Renewal Final Legislative Environmental Impact Statement* (USARAK 1998) also identified 12 parcels on Donnelly Training Area as important calving and post-calving areas for caribou. In the 1986 agreement, the Army agreed to suspend activities or operations that would adversely affect these areas during 15 May through 31 May without consultation with the ADFG. Restrictions in these areas are in effect only when caribou are present. In addition, all development and military actions in the caribou calving grounds will be conducted under winter conditions when there is sufficient snow cover and the ground is adequately frozen to minimize the damage to vegetation and soils.

CHAPTER 4. IMPLEMENTATION

The Sikes Act Improvement Act requires not just preparation and update of an Integrated Natural Resources Management Plan (INRMP), but “implementation” of the plan. The following section discusses the definition and funding implications of implementation.

Implementation anticipates the execution of all “must fund” projects and activities in accordance with specific time frames identified in the INRMP.

An INRMP is considered to be “implemented” if an installation:

- Actively requests, receives, and uses funds for “must fund” projects and activities.
- Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP.
- Coordinates annually with all internal and external cooperating offices.
- Documents specific INRMP action accomplishments undertaken each year.

Natural resource requirements defined by the Office of the Secretary of Defense as environmental "must fund" are those projects and activities required to meet recurring natural resources conservation management requirements or current natural resources compliance needs. The Army equivalent to Office of the Secretary of Defense's "must fund" projects are projects as described in classes 0 (recurring funds to maintain Sikes Act required trained personnel) and 1 (currently out of compliance with the Endangered Species Act, Sikes Act, Clean Water Act, Migratory Bird Treaty Act, etc. in current Army policy and guidance for identifying environmental program requirements.

All projects listed in an INRMP are not necessarily environmental class 0 or 1. Implementation of INRMPs is a shared responsibility among those activities that use the land (e.g., trainers, facility managers, provost marshal) as well as those who ensure compliance and provide overall program oversight. Accordingly, projects necessary to implement INRMPs are not limited to environmental funds. However, INRMPs should include all projects.

Projects are contained in this chapter will be reviewed and updated annually upon completion of Army review and validation processes.

4.1 Natural Resources Management Implementation

The objective of this section is to provide an operational component to this INRMP by taking all of the information that has been captured in previous sections of the plan and integrating the information. The intent of this format is to manage installation natural resources by ecosystem management units and sub-units. USAG FWA has been broken down into ecosystem management areas that could be represented by maneuver areas, ranges, training areas, watersheds, geographic areas, habitat types, etc. Each ecosystem management unit integrates goals and objectives for natural resources and training.

This ecosystem management appendix is organized by ecosystem management units. For each ecosystem management unit, a detailed description of the environment is followed by a description of each ecological management sub-unit. That description includes military use, natural resources management policy, public access policy, outdoor recreation policy, and subsistence policy applicable to each specific sub-unit. This section lays out goals and objectives for each sub-unit, integrates those objectives, and discusses management tools to be used to accomplish those objectives.

4.1.1 Fort Wainwright Land Management Units

4.1.1.1 Military Training Areas

Fort Wainwright organizes, schedules, and manages training through the use of training area boundaries. Fort Wainwright is broken down into a number of smaller training areas.

4.1.1.2 Ecological Management Units

Ecological management units in Fort Wainwright have been created to integrate fish, wildlife, and plant management with military and other land uses. Each ecological management unit will have a management prescription that will define compatible uses, prioritize those uses, define allowable public access, and delineate ecosystem management objectives. Prioritizing land uses for each management unit guides conflict resolution.

Ecological management units follow roughly the boundaries of the ecodistricts cited in the Fort Wainwright ecological land classification. Ecological management sub-units closely follow training area boundaries to allow more effective management, since the primary land use, military training, is scheduled by training area.

Ecosystem management units include Fort Wainwright Main Post, Tanana Flats Training Area, Yukon Training Area, Donnelly Training Area, Gerstle River Training Area, Black Rapids and Whistler Creek Rock Climbing Site. Although not specifically broken out separately in this appendix, this plan covers all Army lands in Alaska, to include but not limited to: Dyke Range, Seward Recreation Camp, Gulkana Glacier Training Site, , Haines Terminal, Tok Terminal and Haines-Fairbanks Pipeline.

4.1.2 Environment

Physical resources, biological resources, and cultural resources are described in detail below for each ecological management unit.

4.1.3 Military Use

Military land use can be separated into two broad groups: urban areas and training areas. Urban areas include most of the developed areas on an installation. Training areas also can be separated into two broad categories – maneuver training and weapons training. Maneuver training is conducted primarily in training areas. A training area is space for ground and air combat forces to practice movements and tactics as specified in the unit's Army Training and Evaluation Program. Different unit types may work in support of one another (combined arms), or the unit may operate on its own to practice a specific set of Army Training and Evaluation Program tasks. Included in these areas are bivouac sites, base camps, drop zones, artillery and mortar firing points, and other miscellaneous training areas. Each training area is managed and scheduled by Range Control. Weapons training also has land-based requirements. Weapons training occurs primarily on firing ranges, and munitions from firing ranges land in surface danger zones or impact areas. Descriptions for each military land use category are listed in Table 4-1.

Table 4-1. Military Land Use.

General Land Use Type	Primary Military Land Use Category	Secondary Military Land Use Category	Description

General Land Use Type	Primary Military Land Use Category	Secondary Military Land Use Category	Description
Urban Areas	Cantonment Area		The area where most of the buildings are located, including buildings for office use, indoor training facilities and housing for Soldiers and their families.
	Recreation Areas		Areas are designated as recreation areas when recreation use is the primary land use. Examples include Glass Park Recreation Area and the Chena Bend Golf Course.
	Ammunition Storage		Ammunition storage areas are off-limits areas where ammunition is stored. These areas are typically fenced off and are not compatible with other land uses.
Training Areas	Weapons Training	Firing Ranges	Ranges are semi-permanent or permanent facilities for weapons firing, demolition, assault courses, or other specific training, usually with associated buildings or berms. This includes firing ranges, assault courses, urban assault areas, etc. Firing ranges are areas, which are controlled and restricted for firing live ammunition from direct fire or line-of-sight weapons systems at targets within a controlled area. Typically, a range has left and right boundaries, which extend from the firing line forward to just past the last target array. Training ranges are normally reserved and equipped for practice and qualification in weapons delivery and/or shooting at targets. Further, training ranges constitute a functional complex that normally includes a Range Control tower with associated firing points, lanes or pits, a cleared or graded area, target system emplacements, and a firing flag and flagpole, in addition to equipment-in-place such as target control systems, target systems, targets and fixed PA system components. A range could include an area for back blast safety zones, which can have a secondary use as non-dudded impact area or maneuver area.
		Non-Dudded Impact Areas	A surface danger zone or a non-dudded impact area is an area that has designated boundaries within which ordnance that does not produce duds will impact. This area is composed mostly of the safety fans for small arms ranges. The primary function of the impact area is to contain weapons effects as much as possible using earthen berms or natural terrain features. These impact areas may be used for maneuver, at the cost of curtailing use of weapons ranges.
		Dudded Impact Areas	A dudded or high intensity impact area is an area having designated boundaries within which all potential dud-producing ordnance will detonate or impact. Vehicle bodies are sometimes placed in the area to act as targets for artillery direct and indirect fire. The primary function of the impact area is to contain weapons effects as much as possible using earthen berms or natural terrain features. Impact areas containing potential unexploded ordnance may not be used for maneuver.
	Maneuver Training Areas	Maneuver Areas	Maneuver areas generally are open to semi-open areas where vehicles can move without running into obstacles such as trees, range buildings, streams, wetlands, lakes, etc. Military activities that occur in maneuver areas include conducting offensive operations, conducting tactical movement, movement to contact, relocating a unit to a new site, defending assigned area, relocating/establishing new area of operations, trail construction, mobility and counter mobility operations, reducing obstacles with equipment, and constructing obstacles with equipment.

General Land Use Type	Primary Military Land Use Category	Secondary Military Land Use Category	Description
		Bivouac Areas	Bivouac areas are areas where units stop together for a period of time. Most often, bivouac areas are semi-open to semi-closed areas where the units "camp out." Activities conducted in bivouac areas are assembly area operations, combat service support operations, and unit security and defense operations.
		Foot Use Areas	Foot use areas are areas that show little or no impacts from military use. Units are on foot and are conducting movement to contact and land navigation.
		Drop Zones	Drop zones or landing zones are cleared areas used for dropping troops and equipment that are maintained by mowing and hydro axing. These areas should have vegetation, but are probably highly disturbed. Military activities include airborne assault, air assault in support of combined arms, aeromedical evacuation, and landing zones for rotary wing aircraft.
		Firing Points	Firing points are localized areas from which either artillery or mortars are fired. These areas are often open areas with high vegetation disturbance. Firing points are sometimes also designated by survey markers.
		Airstrips	Airstrips and assault strips are semi-permanent or permanent facilities for aircraft landing and taking off that are not paved or part of an urban area.
		Road Corridors	Road corridors are defined as semi-permanent or permanent access ways (including ditches and the open right-of-way on each side of the road), which are improved, semi-improved or receive some type of maintenance.
		Rights-of-Way	Rights-of-way are any areas used for utility or pipelines (electric, gas, or communication). Areas bordering either side of improved roads are part of the road corridor and are not considered a separate right-of-way polygon in this case.
		Excavations	Excavations are gravel pits or military engineer training areas and similar types of areas that show signs of digging, either manual or mechanical.

4.1.4 Access

Public access onto Fort Wainwright lands is allowed (subject to safety restrictions and military security) when access does not impair the military mission, as determined by the installation commander. Access is controlled through the USARTRAK check-in system. USARTRAK permits users to check in to certain areas if those areas are not closed for military training in compliance with Fort Wainwright regulations. The amount of permanent limitations and restrictions on public access in any given area within Fort Wainwright lands depends on the type of military land use. Military land use can be broken down into four general categories that affect access.

4.1.4.1 Training Areas and Non-firing Facilities

Public access into training areas is allowed (subject to safety restrictions and military security) when access does not impair the military mission, as determined by the installation commander. Compatible uses generally include natural resource management, habitat improvement, vegetative resource extraction, hunting, fishing, trapping, bird watching, hiking, skiing, sledding, dog mushing, and off-road recreational vehicle use. In general, activities that are not compatible with training areas include any permanent non-military structures, easements, or leases.

4.1.4.2 Firing Ranges and Surface Danger Zones

Public access into firing ranges and surface danger zones is normally not allowed due to conflicts with the military mission. However, there are times during the year when public use does not conflict with military training and public access is allowed into these areas. Compatible uses generally include natural resource monitoring, range maintenance, fire prevention and suppression, hunting, fishing, and trapping. In general, activities that are not compatible with firing ranges and surface danger zones include any permanent non-military structures, easements, or leases.

4.1.4.3 High Hazard Impact Areas

Public access into high hazard impact areas is prohibited because of the hazard of unexploded ordnance. Compatible uses include remote monitoring of natural resources and military impacts, and prescribed burning to reduce fire hazards and improve habitat. Activities that are not compatible with dudded impact areas include any ground-based natural resources management, any digging whatsoever, mineral extraction, commercial timber sales, hunting, fishing, trapping, bird watching, off-road recreational vehicles of any kind, dog mushing, airboats, camping, new construction, easements, and leases.

4.1.4.4 Urban Areas

Public access into urban areas is allowed subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander. Compatible uses generally include natural resource management, habitat improvement, mineral or vegetative resource extraction, bird watching, fishing, hiking, skiing, and sledding. In general, activities that are not compatible with urban areas are hunting and trapping.

4.1.5 Natural Resources Management

Natural resources management categories are shown in Table 4-2 and described in detail in the following sub-sections.

Table 4-2. Ecosystem Management Prescription Categories

Natural Resources Management Priorities	Fire Suppression Categories	Vegetation Management	Hunting, Trapping, Fishing	Recreational Use Management
• High use • Full • Modified • Limited	• Critical • Full • Modified • Limited	• Army • BLM	• Open • Closed	• Open • Modified • Limited • Closed

4.1.5.1 Natural Resources Management Priorities

Each ecological management unit will be managed under one or more natural resource management levels described below:

High Use Management. High use management areas are sub-units that are highly populated, receive high levels of use and are easily accessible by road. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted.

Full Management. Full management areas are sub-units that receive use and are accessible by road. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted with exception of high use urban area management options.

Modified Management. Modified management areas are sub-units that receive use, are not accessible by road, but are open to public access. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted, but may not be practical.

Limited Management. Limited management areas are sub-units where public access is prohibited. Methods of ecosystem management will concentrate on remote monitoring and passive means of conducting management.

4.1.5.2 Fire Suppression Categories

Fire suppression priorities are grouped into four categories: Critical, Full, Modified, and Limited. Summaries of each category are presented below.

Critical Management Option. Areas receive maximum detection coverage and are highest priorities for attack response. Immediate and aggressive initial attack is provided. Land owners/managers are notified of the situation as soon as possible. Critical management areas receive priority over adjacent lands and resources in the event of escaped fires.

Full Management Option. Areas receive maximum detection coverage and receive immediate and aggressive initial attack responses. If the initial attack response is successful or the fire is otherwise controlled within the first burning period, special agency notification is not required. When fires escape initial attack and require additional suppression, affected land owners/managers are notified to develop further fire strategy.

Modified Management Option. This option provides a management level between Full and Limited. The intent is to provide a relatively high degree of protection during periods of increased fire danger, but a lower level of protection when risks of fires are diminished. Modified areas receive maximum detection coverage. Initial attack action, or non-action, is based on a standardized evaluation date determined by the Alaska Interagency Wildland Fire Coordination Group. Unmanned fires are monitored.

Limited Management Option. This option recognizes areas where natural fire is important or the values at risk do not warrant the expense of suppression. Limited management areas receive routine detection effort. Attack response is based on needs to keep the fire within Limited management areas and to protect individual Critical management sites within Limited management areas. Land owners/managers are immediately notified of fires detected. Unmanned fires are monitored.

There is one special category on Army lands in Alaska. Restricted or Hot Zone is a category used for impact areas and other places where no on-the-ground fire fighting occurs. Fires can still be suppressed in Restricted Areas, but suppression is through back burning or aerial-dropped retardant.

4.1.5.3 Forestry and Vegetation Management

Timber utilization procedures depend on vegetation rights management authority. Three vegetation rights land management authority categories exist on Fort Wainwright lands: withdrawn lands for military use from public domain where vegetation rights are managed by the BLM, withdrawn lands for military use from public domain where vegetation rights are managed by Fort Wainwright, and fee simple lands purchased by the Army where vegetation rights are managed by Fort Wainwright. Under applicable withdrawal legislation for the Tanana Flats Training Area, Yukon Training Area, Donnelly Training Area East and West, and through Public Land Orders 2622 and 2676, the United States Department of the Interior, BLM retains vegetation rights. Any vegetation manipulation by Fort Wainwright is done in cooperation with BLM (BLM). BLM and Fort Wainwright timber management practices and contract stipulations govern timber sales from these lands. The withdrawals for the Main Post training areas of Fort Wainwright and Fort Greely, Dyke Army Range, Charlie and Bravo Batteries, Gerstle River Test Site, and Whistler Creek Rock Climbing Area. PLO 4161 does not indicate any vegetative management responsibilities for BLM and therefore any sale of timber would be processed through the Army's forest management system. On lands the Army has vegetation rights, any sale of timber would be processed through the Army's forest management system. Future timber harvest activities would be for military mission support and harvest levels are not expected to dramatically increase from past levels.

4.1.5.4 Outdoor Recreation Management

Hunting, Trapping, and Fishing Areas

In each ecosystem management unit, areas are either open or closed to hunting, trapping, or fishing depending on season. Some areas that are open to hunting may be closed to trapping and bear baiting, due to the type and frequency of military training that occurs within the training area.

Off-Road Recreational Vehicle Management Areas

Fort Wainwright Regulation 190-13 (Appendix D), and the Fort Wainwright Recreation Supplement, addresses areas open and closed to off-road recreational vehicle use on Fort Wainwright lands. Use of privately owned off-road recreational vehicles on post is allowed on a limited basis. All land and water areas will be closed to off-road recreational use by motorized off-road recreational vehicles except those areas and trails which are determined suitable and specifically designated for such under the procedures established in this Integrated Natural Resources Management Plan. All areas that are determined open for recreational use may be closed temporarily during periods of military use. All users must check in through USARTRAK prior to entering Fort Wainwright lands to determine if areas are open to recreational use. Fort Wainwright uses the following classification system to describe recreation areas on the installation.

> ***Open Use Area*:** Open to all types of off-road recreational vehicles. Open to all other recreational activities year-round.
>
> > *Frozen* (6+ inches of snow cover)**:** No restrictions for any off-road recreational vehicles when soil is frozen.
> >
> > *Unfrozen summer conditions:* During unfrozen conditions, off-road recreational vehicles over 1500 lbs (road vehicles, dune buggies, Argos, small unit support vehicles etc.) must stay on existing roads and trails. No restrictions for off-road recreational vehicles under

1500 lbs (ATVs, snowmachines, dirt bikes etc.). Motorized watercraft must stay within existing open water channels.

Modified Use Area: Open to all types of off-road recreational vehicles. No restrictions for any off-road recreational vehicles when soil is frozen. All off-road recreational vehicles must stay on existing roads and trails during the summer. Motorized watercraft must stay within existing open water channels. Open to all other recreational activities year-round.

Limited Use Area: Open to all non-motorized recreation (hunting, fishing, trapping, hiking, skiing, and berry picking) year-round but are not open to any type of off-road recreational vehicle at any time. Motorized watercraft must stay within existing open water channels.

Special Use Management Area: An area managed for recreational use under specific rules that apply only to that area.

Closed Area: Closed to all recreational activities year-round. Airfields, tank farm, landfill, small arms ranges, impact areas, ammunition storage point.

The Fort Greely Resource Management Plan restricts off-road recreational vehicles along the Trans-Alaska Pipeline System work pad used for maintenance along its line without permission of Alyeska Pipeline Service Company. Recreational User Group (RUG) Permits can be obtained at any of the pump stations or from Alyeska Corporate headquarters in Anchorage.

Off-Road Recreational Vehicle Management Areas

Fort Wainwright Regulation 190-13 (Appendix D), and the Fort Wainwright Recreation Supplement, addresses areas open and closed to off-road recreational vehicle use on Fort Wainwright lands. Use of privately owned off-road recreational vehicles on post is allowed on a limited basis. All land and water areas will be closed to off-road recreational use by motorized off-road recreational vehicles except those areas and trails which are determined suitable and specifically designated for such under the procedures established in this Integrated Natural Resources Management Plan. All areas that are determined open for recreational use may be closed temporarily during periods of military use. All users must check in through USARTRAK prior to entering Fort Wainwright lands to determine if areas are open to recreational use. Fort Wainwright uses the following classification system to describe recreation areas on the installation.

***Open Use Area*:** Open to all off-road recreational vehicles and motorized/non-motorized watercraft. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs or less unless specified by the DPW Conservation Branch or the Conservation Law Enforcement and there is no potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. Vehicles with a GVWR greater than 1500 lbs are restricted to improved roads if the operator does not possess a special use permit issued by the DPW Conservation Branch. Motorized Watercraft must stay within existing open water channels.

Frozen (6+ inches of snow cover)**:** No restrictions for any off-road recreational vehicles when soil is frozen.

Unfrozen summer conditions: During unfrozen conditions, off-road recreational vehicles over 1500 lbs (road vehicles, dune buggies, Argos, small unit support vehicles etc.) must stay on existing roads and trails. No restrictions for off-road

recreational vehicles under 1500 lbs (ATVs, snowmachines, dirt bikes etc.). Motorized watercraft must stay within existing open water channels.

Modified Use Area: Open to all types of off-road recreational vehicles with a GVWR of 1500 lbs or less and Motorized Watercraft. Vehicles with a GVWR greater than 1500 lbs are not allowed at any time without a special use permit issued by the Fort Wainwright Garrison Commander. No restrictions for off-road recreational vehicles 1500 lbs or less unless activity has potential for damage to the surface soil layer, creates ruts, subsidence, or erosion. Motorized watercraft must stay within existing open water channels.

Limited Use Area: Closed to all off-road recreational vehicles. Motorized watercraft must stay within existing open water channels. Open to all non-motorized recreation (hunting, fishing, trapping, hiking, skiing, and berry picking) year-round but are not open to any type of off-road recreational vehicle at any time.

Special Use Management Area: An area managed for recreational use under specific rules that apply only to that area (i.e., Tanana Flats Training Area Airboat Special Use Management Area).

Closed Area: Closed to all recreational activities year-round. Closed areas include, but are not limited to, airfields, tank farm, landfill, small arms ranges, impact areas, ammunition storage points, etc.

The Fort Greely Resource Management Plan restricts off-road recreational vehicles along the Trans-Alaska Pipeline System work pad used for maintenance along its line without permission of Alyeska Pipeline Service Company.

4.1.5.5 Subsistence

There are no federally designated or state recognized subsistence areas on Fort Wainwright lands. However, it is acknowledged that either federal or state subsistence users may conduct subsistence activities on Fort Wainwright lands even though no federal or state subsistence priority exists for these users. All recreation and subsistence users must comply with existing state, federal, and Fort Wainwright regulations for access and use on Fort Wainwright lands.

4.1.6 Prescriptions

The **Prescriptions** are the specific objectives and projects that are to be carried out as part of the management plan. The Prescriptions are intended to be the functional part of the Integrated Natural Resources Management Plan that will be pulled off the shelf to be used.

Each ecosystem management unit section below includes a brief description of baseline data or current condition, management goals and objectives, projected use (to include mission), and a desired future condition to support training and/or natural resource objectives. Descriptions are supported with Geographic Information System mapping for resources and training use. Each ecosystem management unit section also identifies off-post areas as appropriate. Off-site areas are also evaluated for desired future conditions, type of management preferred to support training or installation sustainability, and whether there may be opportunities for purchase or to establish buffers.

4.1.7 Projects

Each section describes the "tools" used to achieve the goals and objectives and desired future condition for each ecosystem management unit. Tools are the various programs on the installations that can be used to achieve the desired results. These include: forestry, fish and wildlife, Integrated Training Area Management, sustainable range management, pest management, fire management, outdoor recreation, etc. For each program or tool that is applicable for a given ecosystem management unit area, specific projects to be accomplished are identified with specific timeframes. Each project would identify specific prescriptions, strategies, techniques, or measurable standards that would contribute to achieving the objectives for the functional area. Specific objectives to meet the INRMP goals are listed below. Each project listed in the following sections in the INRMP must meet one or more of these specific goals.

Military Readiness

Goal: Provide quality natural resources, as they are critical training assets for accomplishing the military mission of USARAK.

Objectives:

- MR-1. Ensure no net loss in the capability of Fort Wainwright's lands to support existing and projected military missions.
- MR-2. Maintain quality training lands through damage minimization, mitigation, and restoration.
- MR-3. Maintain and enhance training area accessibility by controlling vegetation. This includes maintaining vegetation on existing sites and clearing vegetation in new areas to create additional training opportunities and increase the amount of area available for training.
- MR-4. Maintain and enhance training area accessibility by utilizing soil stabilization measures to provide sustainable access to existing sites as well into new areas to create additional training opportunities and increase the amount of area available for training.
- MR-5. Maintain and enhance fire and fuel breaks to reduce the spread of uncontrolled wildfire resulting from live fire activities.
- MR-6. Extend available training days through reduction of hazard fuels in and around live fire ranges

Stewardship

Goal: Manage natural resources at Fort Wainwright to ensure good stewardship of public lands that are entrusted to the Army's care.

Objectives:

- S-1. Support stewardship of natural resources through joint management of resources on withdrawn lands with BLM.
- S-2. Support stewardship of game and non-game species and their habitats by partnering with ADFG and USFWS for survey, monitoring and management.
- S-3. Use ecosystem management philosophies to protect, conserve, and restore native fauna and flora with an emphasis on biodiversity enhancement.
- S-4. Support stewardship of natural resources by conducting planning level surveys of flora, fauna, vegetation communities, wetlands, surface waters and topographical features.
- S-5. Support stewardship of species at risk through the identification of at risk species, delineation of their habitats, monitoring and development of management strategies.

- S-6. Monitor and manage soils, water, vegetation, and wildlife on Fort Wainwright's lands with a consideration for all biological communities and human values associated with these resources.
- S-7. Provide economic and other human-valued products of renewable natural resources when such products can be produced in a sustainable fashion without significant negative impacts on the military training mission.
- S-8. Manage to protect, restore, maintain or enhance sensitive species, wetlands, and unique areas.
- S-9. Involve the surrounding community in Fort Wainwright's natural resources program.
- S-10. Support conservation of sensitive populations and communities.
- S-11. Minimize loss of wetlands on a landscape/watershed level.
- S-12. Enhance soil, water and air quality through the implementation of BMPs and SOPs.
- S-13. Maintain subsistence resources

Quality of Life

Goal: Improve the quality of life for the Fort Wainwright communities and the general public through development of high quality natural resources-based recreational opportunities.

Objectives:

- QL-1. Provide opportunities for consumptive uses of natural resources within the biological and recreational carrying capacities.
- QL-2. Provide natural resources-based opportunities for other outdoor recreation such as hiking, snowmobiling, boating and birding.
- QL-3. Provide conservation education opportunities to the military and civilian community.
- QL-4. Establish and maintain an environmental setting conducive to a healthy and satisfying lifestyle for the military community.
- QL-5. Maximize opportunities for soldier, civilian and public recreation on military lands within the constraints of the military mission, safety and environmental sustainability.
- QL-6. Maintain USARTRAK System
- QL-7. Educate recreational users on recreational opportunities and restrictions

Compliance

Goal: Comply with laws and regulations that pertain to management of Fort Wainwright's natural resources.

Objectives:

- C-1. Minimize impacts to soil, water and air quality through compliance with all laws, regulations, ordinances, and executive orders.
- C-2. Manage natural resources within the spirit and letter of environmental laws, particularly the Sikes Act, upon which this INRMP is predicated.
- C-3.Implement this INRMP within the framework of Army policies and regulations.
- C-4. Use the NEPA process to make informed decisions that include natural resources considerations, mitigation, and agency and public involvement.
- C-5. Ensure that Fort Wainwright's natural resources program is consistent with the protection of cultural and historic resources.
- C-6. Obtain and maintain permits from regulatory agencies to support activities necessary to support the military mission including natural resource projects.
- C-7. Focus surveys on potential development zones to support future construction and training permit requirements.

- C-8. Meet mitigation requirements resulting from MOUs, MOAs, permits and NEPA documentation
- C-9. Maintain procedures to prevent, respond and clean up spills
- C-10. Protect human health and safety through the maintenance of institutional controls and the management of contaminated sites.
- C-11. Provide professional enforcement of natural resource laws.

Integration

Goal: Comply with laws and regulations that pertain to management of Fort Wainwright's natural resources Integrate elements of natural resources management into a single program that in turn is integrated into Fort Wainwright's environmental and military training programs.

Objectives:

- I-1. Ensure the integration of, and consistency among, the various activities identified within this INRMP.
- I-2. Enhance integration by partnering with internal and external partners and stakeholders to support sustainability of military lands
- I-3. Ensure that natural resources management is consistent with principles of integrated pest management at Fort Wainwright posts.
- I-4. Ensure the integration of new military infrastructure development with the principles and guidelines of this plan.
- I-5. Use the natural resources program to support and enhance other elements within the Fort Wainwright's environmental programs.
- I-6. Provide the command with information needed to make decisions, which include natural resources-related values.
- I-7. Enhance integration through information excellence by maintaining GIS Data acquisition, storage, retrieval and access; maintaining Electronic Data Management System; Environmental Management System; and maintaining a database to assess cumulative effects of military activities

4.2 Fort Wainwright Main Post Ecological Management Unit

4.2.1 Location

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 interior Alaska in the Fairbanks North Star Borough. The installation ecological management unit consists of the Main Post, Tanana Flats Training Area, Yukon Training Area (Yukon Training Area) and Dyke Range. Fort Wainwright is the fourth largest Army training area in the United States. Figure 4-1 shows the location of Fort Wainwright Main Post.

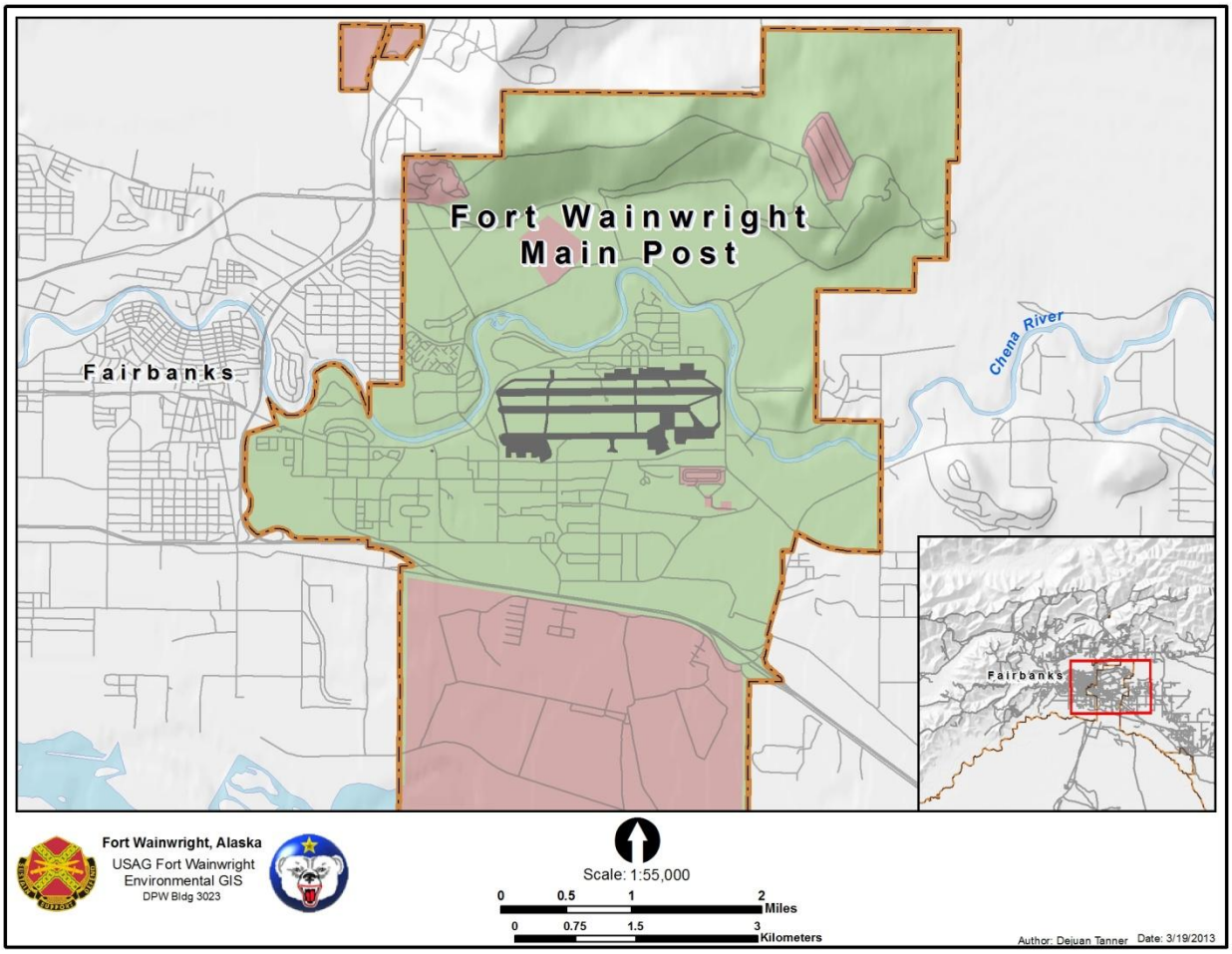


Figure 4-1. Fort Wainwright Main Post.

The Main Post is two miles east of central Fairbanks on the Chena and Tanana rivers. It contains the cantonment area, a small arms range complex, and a close-in range complex. The Main Post occupies approximately 13,500 acres.

4.2.2 Facilities

4.2.2.1 Cantonment Facilities

The Fort Wainwright main post is composed of approximately 5,785 acres of urban area including the cantonment area, housing and Wainwright Army Airfield. There are approximately 5,000acres of training area in 11 officially designated LTA's suitable for small unit training. Terrain varies along a gradient from low wet areas to flat wooded areas and wooded slopes.

There are a number of facilities available for training including: Improvised Explosive Device Defeat Lane, Biathlon Range at Birch Hill, FWA CACTF, NBC chamber, Engineer Pit, and Warrior FOB.

Fort Wainwright Cantonment area is accessible from the Fairbanks and North Pole areas by Trainor and Airport Way gates and Badger gate respectively. A rail line connects Fort Wainwright to Fairbanks and North Pole as well. The Chena River bisects the main post area and provides river access to the post.

4.2.2.2 Donald E. Rudolf Small Arms Complex Facilities

The small arms range complex is located on the south side of the Richardson highway across from the main post area. The area is bordered by the Richardson highway and the Tanana River to the north and south respectively. Total area is approximately 3,091 acres of flat terrain.
Training facilities include: 40MM HE, 40 MM TPT, Combat Pistol, Hand Grenade Qualification, Hand Grenade Live Fire, KD/Zero, M16 Qualification, Multi Purpose Machine Gun, MK 19 Range, MP Qualification Range, Match Shoothouse, Shoothouse, Arctic Village, 25 Meter Range, AT-4 Range, M-203 Range, Urban Assault Course, After Action Review Facility, Breach Facility and 3 Firing Points.

The range is accessed only via the Richardson highway. A rail line runs along the Western boundary of the range and the Tanana River along the Southern boundary however both of these lack an established access point.

4.2.2.3 Transportation Facilities

Fairbanks is a transportation center for much of central, northern, and northwestern Alaska. There are 841 miles of paved highways and over 1,000 miles of unpaved highways in and around Fairbanks. The George Parks, Steese, and Richardson highways bisect the area. The Parks Highway links Fort Richardson to Fort Wainwright, and the Richardson Highway links Fort Greely to Fort Wainwright. The Richardson Highway also connects Alaska with the Canadian road system via the Alaska Highway.

The Alaska Railroad provides rail service to Main Post Fort Wainwright. Alaska Railroad's main line passes through the Main Post, with spur tracks serving the central heating and power plant and warehouse circle. The track also connects with the Fairbanks industrial spur. The Alaska Railroad provides seasonal passenger and year-round freight and vehicle service between Anchorage and Fairbanks. Most northbound freight arrives by sea at the port of Anchorage for transfer to the railroad. The port of Anchorage has intermodal capability.

Wainwright Army Airfield and Eielson Air Force Base, about 17 miles south of Fort Wainwright, can support any type of military aircraft including the C-5 Galaxy. In addition, Allen Army Airfield at Fort Greely can support C-5 aircraft in the winter and C-17 Globemaster III aircraft at all other times.

Fairbanks International Airport, five miles west of Fort Wainwright, is the nearest commercial airport. It is one of two international airports in Alaska and is served by several U.S. and international passenger and cargo airlines.

4.2.2.4 Water Supply

As of February 1996, Fort Wainwright had nine main drinking wells, two of which were active (Buildings 3559-1A and 3559-2B). In addition, there are drinking water wells for individual buildings. Water use on Fort Wainwright varies from 1.5 million gallons per day in winter to 2.0-2.5 million gallons per day in summer.

4.2.3 Physical Resources

4.2.3.1 Topography

Fort Wainwright lies north of the Alaska Range, within the drainage of the Tanana River. The Main Post lies within the Tanana-Kuskokwim lowland. This depression was subsiding as the Alaska Range was

rising to the south, and filling with sediments from those mountains. The area is bounded by uplands to the north, the Alaska Range to the south, and consists of alluvial fans extending northward from the mountains. The Tanana River flows along the northern edge of the lowland. The terrain is generally flat lowland, ranging from 128 to 512 feet above sea level (Nakata Planning Group 1987). Elevation gradients range from 40 to 50 feet/mile along upper portions of fans, to 6 to 7 feet/mile in the Tanana Flats (Racine et al. 1990).

4.2.3.2 Geology

Central Alaska has not been glaciated, but during glacial advances, glaciers surrounded the area. Climatic fluctuations during the Quaternary Period caused glacial expansion and recession (Racine and Walters 1991). Rivers flowing from glaciers deposited several hundred feet of silt, sand, and gravel in the Tanana and Yukon valleys. Most of the area is covered by a layer of loess ranging from several inches to more than 128 feet thick. Gravel deposits along the Tanana River are up to 154 feet thick and are a significant source of groundwater (Nakata Planning Group 1987).

4.2.3.3 Soils

A soil survey exists for the Main Post area of Fort Wainwright, but its accuracy and detail is inadequate for the needs of the installation. Most of the Main Post area is Chena alluvium, an unconsolidated silt-gravel mixture. Discontinuous permafrost lies just under the surface in some areas. The unconsolidated silt-gravel mixture freezes perennially. It has a high bearing strength when frozen, but is subject to sliding and is difficult to compact when thawed. Northernmost portions of the post are in the foothills of the Yukon-Tanana Upland and consist of bedrock covered by muck and loess. Permafrost-affected soil below the surface inhibits drainage and has very low bearing strength when thawed. Swale deposits, made up of poorly stratified silt, sand, and organic matter, are scattered along the Richardson Highway and in parts of South Post. These deposits have high ice content and freeze perennially (Nakata Planning Group 1987).

4.2.3.4 Water Resources

4.2.3.4.1 Surface Water

Fort Wainwright's surface water resources are diverse and include numerous rivers, streams, ponds, and lakes. The Tanana and Chena rivers drain Main Post.The volume of flow fluctuates dramatically by season. During the long period of freeze, usually from October to May, flow is limited to seepage of groundwater from aquifers into streams. Many small streams freeze solid (zero discharge) during winter. Snowmelt typically begins in March or April and reaches its peak in June. Flow is greatest during June and July. By the end of July, most snow has melted, and a steady flow during August and September is sustained by rainfall. The Chena River is non glacier-fed and reaches peak flow before the Tanana River, which is fed by meltwater from glaciers and snowfields in the Alaska Range (Nakata Planning Group 1987).

The Chena River, from the Chena Slough to the confluence with the Tanana River, has been classified by the state of Alaska as Class A (suitable for agriculture, aquaculture, and industrial), Class B (suitable for water recreation), and Class C (suitable for growth and propagation of fish, shellfish, other aquatic life, and wildlife). The pH of the Chena River is slightly above neutral during winter and slightly below neutral in summer. Nitrogen concentration is high in relation to phosphate, which may be the limiting inorganic nutrient for phytoplankton production. Only naturally occurring iron concentrations were higher than the secondary state standards. The high iron concentration in the lower portion of the Chena River may be the result of surface water and groundwater discharge from swampy, muskeg areas in this region. Sediment loads are generally low. Non glacier-fed streams generally carry less than 300 mg/l during high flow and as little as 10 mg/l during low flow periods (Bureau of Land Management and U.S. Army 1994).

4.2.3.4.2 Groundwater

Groundwater is one of Fort Wainwright's most valuable natural resources. With the exception of naturally occurring metals, groundwater quality is good in the Fort Wainwright area. Much of Main Post is underlain by an alluvial aquifer. Groundwater in the aquifer is recharged by the Tanana River, though the Chena River and direct infiltration of precipitation also contribute small amounts. Groundwater potential is best along the alluvium of the Tanana River, where wells are capable of yielding 3,000 gallons per minute (gpm) at less than 200 feet in depth. The lowest potential is in the rolling hills of the Yukon Training Area, where wells produce around 50 gpm at the same depth (Nakata Planning Group 1987).

Groundwater in the Fort Wainwright area tends to have relatively high, naturally occurring levels of metals, especially iron and arsenic. Elevated arsenic levels are prevalent in the upland areas. These naturally occurring metals are not related to human-caused pollution (Harding Lawson Associates 1996).

Army-related industrial activity in Main Post has, to an unknown degree, contributed to groundwater pollution, generally associated with leaking underground storage tanks, facilities where chemicals were stored, and places where chemicals were dumped during the early history of the post. These areas are currently included in an intensive monitoring program. Pollution is generally localized, and there is no indication of deep groundwater pollution. The recent trend has been toward water quality improvement as Army restoration projects mitigate damage to groundwater quality. Practices that have led to groundwater contamination have been discontinued; for example, underground storage tanks have been removed and all petroleum, oils, and lubricants are now stored in aboveground tanks surrounded by containment berms.

Due to past contamination of localized areas, primarily within the Main Post area, Fort Wainwright is classified as a Comprehensive Environmental Response, Compensation, and Liability "Superfund" site. Remediation is ongoing. Groundwater management consists of restoration projects associated with individual sources of pollution, generally associated with the "Superfund" designation. These projects are not classified as natural resources management and are not included within this Integrated Natural Resources Management Plan.

4.2.3.5 Climate

Fort Wainwright has the northern continental climate of the Alaskan Interior, which is characterized by short, moderate summers; long, cold winters; and little precipitation or humidity. Weather is influenced by mountain ranges on three sides that form an effective barrier to the flow of warm, moist, maritime air during most of the year. Surrounding uplands also cause settling of cold, arctic air into Tanana Valley lowlands. Average monthly temperatures in Fairbanks range from –11.5^{o}F in January to 61.5^{o}F in July, with an average annual temperature of 26.3^{o}F. The record low temperature is –66°F, and the record high is 98°F. The average frost-free period is 95-100 days. Prevailing winds in Fairbanks are from the southwest in June and July and from the north and northeast in winter. Average wind velocity is 5.3 miles per hour (mph). The greatest average wind speed is in spring, with a high of 40 mph recorded in Fairbanks. Winds are 5 mph or less 60% of the time. Thunderstorms are infrequent, occurring only during late spring and early summer. Average annual precipitation is 10.4 inches, most of which falls as rain during summer and early fall. Average monthly precipitation ranges from a low of 0.29 inches in April to a high of 1.86 inches in July. Average annual snowfall is 67 inches, with a record high of 168 inches during the winter of 1970-71. Average annual relative humidity is 55%, with lowest levels during spring and early summer (38% during mid-afternoon in May). Heavy fog is relatively common during December and January, with four or five foggy days each month. Ice fog can be expected any time temperatures drop below -30°F, but is normally restricted to areas near human settlements where moisture is emitted from burning fuels (Bonito 1980).

4.2.4 Main Post Biological Resources

4.2.4.1 Flora

Fort Wainwright encompasses a large amount of land with a wide array of physiographic features. Vegetation patterns are influenced by climate, soil, topography (slope, aspect, and elevation), depth to water table, permafrost, and fire. Native vegetation was removed from much of the Main Post during original construction of Ladd Field in the 1940s. Due to landscaping and other human activities, vegetation of Main Post does not reflect natural vegetation patterns of the area (Nakata Planning Group 1987). Fort Wainwright has four vegetation types: scrub bogs, highbrush, open low-growing spruce forests, and closed spruce-hardwood forests. The white spruce-paper birch forest of interior Alaska is often called the boreal forest or taiga. Vegetation types of interior Alaska form a mosaic and reflect fire history, slope and aspect, and presence or absence of permafrost (Viereck and Little 1972).

4.2.4.1.1 Vegetative Profile

A typical vegetation profile from lowland, up a south slope, and down the North Slope, would include the following: water, barren, high brush, deciduous forest, white spruce forest, moist tundra, black spruce forest, and mixed forest (Bonito. 1980). This profile does not precisely match Viereck and Little's (1972) vegetation types, which were mapped on a statewide scale. Wetland occurs at various altitudes and sometimes only during early successional stages. Localized conditions often result in various combinations of vegetation.

A typical vegetation profile from the Little Chena Uplands to the Chena/Tanana River floodplain includes: barren areas (rock and gravel), south-facing xeric communities, highbrush, Upland/Riverine/Lowland forests (coniferous, deciduous, and mixed), open moist forests, open/woodland forest bogs, riverine tall shrubs, scrub shrub bogs/muskegs, wetlands, barren, and water (Anonymous 1979; Bonito 1980).

4.2.4.1.2 Floristics Inventory

During 1995-1996, the Cold Regions Research and Engineering Laboratory conducted a floristic inventory for Fort Wainwright at Fort Wainwright (Tande et al. 1996). The inventory focused on vascular plants, so cryptogams (i.e., mosses and lichens) were not identified. The inventory found 491 taxa (including subspecies and varieties), representing 227 genera in 72 families. This is about 26% of Alaska's vascular flora. At least 10 taxa collected represented extensions of known ranges (Tande et al. 1996). Plants were collected from the Main Post area.

Plants were collected from 31 plots of the Little Chena Upland and Chena/Tanana Floodplain. A total of 1,003 collections were made at 123 sites all over Fort Wainwright Lands. Center for Environmental Management of Military Lands mounted three sets of collected plants. One set was laminated and remains at Fort Wainwright, and the other two are dry mounted and stored at the University of Alaska Museum, Fairbanks.

From 2001-2011 the Range Training Land Assessment program, under the direction of ITAM (Integrated Training Area Management), increased the plant taxa list to 512 for Yukon-Tanana Upland Region, including Main Post.

4.2.4.1.3 Threatened or Endangered, and Species of Concern Plants

Only two plant species on the federal endangered species are known to occur in Alaska. Neither species' current or historic ranges include Fort Wainwright, and a report released in 1996 indicated that there are no federally listed endangered or threatened plant species on Fort Wainwright or Main Post (Tande et al. 1996).

There are, however, 7 vascular plant species of concern that are known to occur on Fort Wainwright Main Post. These plants are being tracked by the Alaska Natural Heritage Program because they are thought to be uncommon or rare in Alaska and/or uncommon or rare globally (Alaska Natural Heritage Program 2013). These species are listed below in table 4-3 and are documented in the survey results of Tande et al. (1996) and Range Training Land Assessment survey efforts.

There are no legal ramifications from these listings, rather they are generated by the Heritage Program to help track the occurrence of these taxa across the state as more botanical work is conducted. The categories listed do not indicate known threats to these species, but they do represent the rather few collections known for each taxa in Alaska and the geographic distribution of those collections. All of these taxa are listed for management in the ecosystem management program for Fort Wainwright Main Post.

Table 4-3. Fort Wainwright Main Post Rare Plant Species.

Species	Common Name	Global Ranking*	Alaska Ranking**
Apocynum androsaemifolium	spreading dogbane	G5	S3
Artemisia laciniata	siberian wormwood	G4?	S3
Ceratophyllum demersum	coon's tail	G5	S3S4
Cicuta bulbifera	bulblet-bearing wáter hemlock	G5	S3
Cryptogramma stelleri	fragile rockbrake	G5	S3S4
Glyceria pulchella	MacKenzie valley mannagrass	G5	S3S4
Oxytropis tananensis	field locoweed	GNR	S3S4Q

* Alaska Natural Heritage Program Rare Species Global Rankings
G3 Either very rare and local throughout its range or found locally in a restricted range (typically 21-100 occurrences)
G4 Apparently secure globally
G5 Demonstrably secure globally
G#G# Global rank of species uncertain; best described as a range between the two ranks
G#T# Global rank of species and global rank of the described variety or subspecies of the species Q Taxonomically questionable
? Inexact

** Alaska Natural Heritage Program Rare Species State Rankings
S1 Critically imperiled in state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state (typically 5 or fewer occurrences, or very few remaining individuals or acres)
S2 Imperiled in state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (typically 6 to 20 occurrences, or few remaining individuals or acres)
S3 Rare or uncommon in the state (typically 21-100 occurrences)
S4 Apparently secure in state, with many occurrences
S#S# State rank of species uncertain; best described as a range between the two ranks
SE possibly introduced

4.2.4.1.4 Ecological Land Classification

An ecological land classification was done for Fort Wainwright lands during 1994, 1995, and 1998. This report included mapping by geomorphology, permafrost, vegetation, ecotypes, ecosubdistricts, and ecodistricts (Jorgenson et al. 1998). The ecological land classification is a hierarchical means to classify land according to various ecological scales. Ecotypes are created by combining associations of vegetation types and geomorphological classes. Ecotypes delineate areas with homogeneous topography, terrain, soil, surface form, hydrology, and vegetation. Ecosections are areas with relatively uniform geomorphic features that have recurring patterns of soils and vegetation. Several vegetation classes may be included in

an ecosection, but they are usually related because they occur as different stages in a successional sequence. Ecodistricts are broader areas with similar geology, geomorphology, and hydrology, and are similar to physiographic units.

The Main Post ecological management unit lies primarily in the Tanana River Floodplain ecodistrict. There are three ecosubdistricts of the Tanana Floodplain ecodistrict that make up Main Post they are the Chena Floodplains, the Fairbanks Lowlands, and the Little Chena Uplands, which includes the Birch Hill area of Fort Wainwright. The Little Chena Uplands are part of the Steese-White Mountain ecodistrict.

4.2.4.2.5 Wetlands

Fort Wainwright's Main Post supports a variety of palustrine freshwater wetlands, most of which are concentrated on the floodplains of the Tanana and Chena Rivers, outskirts of the cantonment area where urbanization activities haven't occurred; and north-facing slopes of Birch Hill. Forest wetlands are dominated by needleleaf trees, such as black spruce, and often have an understory of feather mosses that insulate soils, allowing them to remain frozen for extended periods. Scrub-shrub wetlands, a very common wetland type on Main Post, occur in a variety of landscape positions and are typically composed of stunted needleleaf trees and broadleaf shrubs. Scrub-shrub wetlands dominated by severely stunted black spruce trees are found on cold north facing slopes and valley bottoms, where saturated soils underlain with permafrost prevent larger trees from growing. Scrub-shrub wetlands composed of shrub birch and willow tend to form in seasonally flooded drainages, on terraces, and in areas disturbed by fire and mowing, such as the Small Arms Complex. Emergent wetlands are dominated by graminoid species such as grasses and sedges and occur in seasonally or permanently flooded flat, low-lying areas. They are found on floodplains, on the margins of ponds and lakes, in sloughs, and in localized depressions. Emergent wetlands also develop in trails established in scrub-shrub wetlands, where they form web-like complexes with the surrounding scrub-shrub communities.

During the past two decades, three major wetland mapping efforts have been made to identify and classify Main Post wetlands and waterbodies. In 1992, the National Wetlands Inventory (NWI) produced a map of wetlands and waterbodies for all of Main Post based on the presence of wetland vegetation interpreted from color-infrared photography; these maps are periodically updated by the NWI using current aerial imagery. In 1998, the U.S. Army Engineer Waterways Experiment Station (WES) completed a wetland delineation of Main Post that included a review of existing information, wetland identification and characterization, base map, and final report. In 2008 and 2009, the Center for Environmental Management of Military Lands (CEMML) produced wetland and waterbody maps based on a review of existing information (e.g., NWI maps, NRCS soil surveys) and field surveys that identify waters of the U.S. as small as 0.1 acre. FWA currently uses CEMML's map for management, planning, and permitting purposes.

4.2.4.1.6 Forest Resources

A forest inventory is an integral part in establishing a plan for managing forest resources. The Fort Wainwright cantonment area was inventoried by the Directorate of Public Works, Environmental Forestry Staff during the 2001 field season. Tree data was collected from permanent plots as part of an ongoing forest inventory and analysis of USARAK (Fort Wainwright) lands.

Stand Delineation and Inventory

Stand timber types were delineated using color infrared aerial photographs taken in 1995. This process was also used to help identify geographical coordinates for the plots and to establish permanent plots on the ground. Timber stands were further defined into types based on specific characteristics such as species composition, size class, and stocking. These stand types are predefined by the Alaska Vegetation Classification system (Viereck et al. 1992). The Fort Wainwright inventory method further stratifies out stands with higher timber value, greater ecological importance, and greater potential for military training.

Stand timber typing was confirmed on the ground during stand inventory. The variable plot radius sampling method was used for tree data collection.

Forest Land Classification and Timber Volume Summary
The Fort Wainwright Main Post contains a total of ##,### acres of forest and non-forest land (Table 4-4). Forest lands in the project area occupy ##.#% of the land area or #,### acres. Non-forest land amounts to ##.# % of the total project land area or ##,### acres. The forested lands contain #,### acres of commercial forestland. Commercial forest lands are those lands containing sawtimber and poletimber size classes.

The total volume found in the various types or strata is found in Table PB-3. The estimated total volume of timber in this area is ###,### cubic feet of commercial value. There is #,###,### board feet (Scribner) and over ##,### tons of green biomass. Also provided is potential commercial forest acerage, identified as Timberland, where Main Post has #,### acres and of that acerage ##.#% is accessible (Acessible meaning not within restricted access or impact areas).

Table 4-4. Fort Wainwright Main Post Forest Land Classification and Timber Stand Summary

Forest Category	Total Acreage	Commercial Forest Category	Land Acreage	Percent Total Acres
Forested Lands		Commercial Forest		
		Non-Commercial Forest		
Non-Forested Lands		Shrub/Scrubland		
		Herbaceous		
		Barren-Natural/Cultural		
		WaterBodies		
Total Cubic Feet		**Total Acres**		
Total Board Feet		**Total Timberland Acres**		
Total Green Tons		**Accessible Timberland Acres**		

***Indicates acreage/volumes that is accessible.**
**** Percentages are deferred from accessible acreages of corresponding rows.**

Identification of Sustained Yield Timber Base
The sustained yield timber base is defined as forest land where periodic harvests from the resource can be regulated to be continued for a long period of time if not indefinitely. Estimated annual harvest amounts may fluctuate at variable levels because of market conditions, risks to resources (such as beetle infestation or fire), resources access, or other factors that may encourage or discourage harvest levels. Based on these fluctuations, timber harvest may be concentrated into periods of time separated by years without harvest.

Generally, only productive timberland, where the land manager allows timber harvest, is included in the sustained yield timber base. Management of the sustained yield timber base should be conducted in a manner where the basic productivity of the resource is not negatively affected. Through observation of Fort Wainwright cantonment lands during the field work, it has been determined that timber types

containing poor stocking levels or black spruce generally occur on relatively unproductive sites. Based on this knowledge, timberland that comprises timber types within poorly stocked strata of black spruce is considered not feasible for timber management and is excluded from the sustained yield base. In addition, strata containing recently burned timber types are excluded from the sustained yield acreage. Sawtimber white spruce stands contained varying amounts of root disease and bole rot, which could reduce merchantable volumes for these stands.

Estimated Annual Harvest
An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total productive forest area by the rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The calculations of harvest level are based on the following assumptions:

- The most accessible stands would probably be cut first, leaving the remote stands. Remote stands would be more costly to access, but are still considered in the calculations of estimated harvest levels.
- Growth and age information, field observations and previous timber sale data suggest that white spruce sawtimber products, houselogs and poles can be produced by age 120 years and that hardwood sawtimber products and fuelwood can be produced by age 80. Beyond that age, tree growth begins to decline and mortality increases, especially in the hardwoods.
- Natural regeneration of white spruce and hardwoods depends on two main factors: seed source and type of seedbed. Under normal seed production conditions, it is estimated that natural regeneration will occur within 5 to 10 years following harvest.
- The mixed timber types will be managed for the white spruce component and will use the white spruce rotation age. Pure hardwood timber types will be managed for the hardwood component and will use the hardwood rotation age.

An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total productive forest area by the rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The following Table represents softwood, hardwood, and mixed softwood/hardwood accessible harvest acreage represent saw, pole, and pole/saw timber types; the majority is in the pole/saw type.

Table 4-5. Fort Wainwright Main Post Estimated Annual Harvest.

Harvest Timber Type	Potential Harvest Land	Rotation Age	Regeneration Time	Total Rotation Length	Estimated Annual Harvest
Softwoods	#,### acres	120 years	10 years	130 years	## acres
Hardwoods	#,### acres	70 years	10 years	80 years	## acres
Softwoods/Hardwoods	#,### acres	110 years	10 years	120 years	## acres

4.2.4.3 Main Post Fauna

Most vertebrate species indigenous to central Alaska can be found on Fort Wainwright Main Post. Game species found on Fort Wainwright are managed by the Alaska Department of Fish and Game. The Alaska Department of Fish and Game monitors these species to determine population status, reproductive success, harvest and home ranges. Main post falls within the State of Alaska Game Management Unit

(GMU) 20B and within the special management area entitled "Fairbanks Management Area." Some of the game species found on Fort Wainwright lands include black (*Ursus americanus*) and grizzly (*Ursus arctos*) bears, moose (*Alces alces*) , beaver (*Castor* canadensis), muskrat (Ondontra zibithicus), ruffed grouse (*Bonasus umbellus*), spruce Grouse (*Falcipennis canadensis*), sharp-tailed grouse (*Tymmanuchus phasianellus* . The bald eagle (*Haliaeetus leucocephalus*), is locally common on Fort Wainwright. The Chena and Salcha rivers are important spawning areas for chum salmon (*Oncorhynchus keta*), arctic grayling (*Thymallus arcticus*) and king salmon (*Oncorhynchus tshawytsha*). All of these species inhabit the Tanana River seasonally. Fewer species are found in the Tanana River, due to its higher silt load (Nakata Planning Group 1987). River Road Pond (formerly Sage Hill Pond), Monterey Pond, Weigh Station 1, Weigh Station 2, and Manchu Lake are stocked with fish by the Alaska Department of Fish and Game. Wood frogs (*Rana sylvestris*) are the only amphibians on Fort Wainwright Main Post. There are no reptiles. No federally listed threatened or endangered animals are resident on Fort Wainwright.

There are sixteen species on the Fort Wainwright Ecosystem Management List for Main Post. These are olive-sided flycatcher, lesser yellowlegs, Wilson’s snipe, rusty blackbird, solitary sandpiper, varied thrush, little brown bat, blackpoll warbler, Wilson’s warbler, greater scaup, lesser scaup, northern waterthrush, Townsend’s warbler, wester wood-peewee, great gray owl, and white-winged crossbill.

4.2.4.4 Special Interest Management Areas

Fort Wainwright has several areas with special natural features. They harbor sensitive or unique wildlife species or represent unique plant communities. Sage Hill overlooks a wetland (Sage Hill pond) in the Main Post area. This is a Watchable Wildlife area with a planned viewing platform and signage. In addition, south facing bluffs in this area have ecological significance due to the unique steppe vegetation communities found here. This scenic site has been damaged by gravel removal. No further gravel removal will be allowed.

4.2.5 Main Post Cultural Resources

The Fort Wainwright area has supported human since the end of the Pleistocene, 12,000 years ago. Interior Alaska sites near Army training lands contain some of theoldest verifiable prehistoric remains in the country.

The Tanana Valley is the original homeland of Athabaskan groups. The Tanana Indians, a branch of the Northern Athabaskans, were a highly mobile group at the time of European contact, moving to fish camps in summer, and various hunting and trapping camps during other seasons.

All Main Post buildings have been inventoried. One National Historic Landmark, Ladd Field (now called Ladd Army Airfield), has been formally designated as eligible for inclusion in the National Register. In addition, one Cold War Historic District has also been designated as eligible for inclusion in the National Register.

4.2.6 Main Post Management Prescriptions

The Main Post ecological management unit is composed of two primary land use types: urban areas and light training areas. Urban areas include the cantonment area, landfill, Ladd Army Airfield, and recreation areas such as the ski hill. Training areas are the other primary use type. There are 9 local training areas.

4.2.6.1 Military Use

The Main Post Local Training Areas sub-unit is suitable for small unit training, road marches, bivouacs, and small arms firing at the range complex. The recommended time for military activities in low areas for mechanized vehicles is between freeze-up and spring break-up. Main Post local training areas are capable of supporting small unit training year-round except for wetlands and other lowlands where military activities involving vehicles is limited to winter.

The Urban Areas sub-unit can support small unit training, classroom training, individual training, non-fire range facilities, housing, and office facilities.

4.2.6.2 Natural Resources Management

Fort Wainwright manages the urban areas as "*high use"* management areas. High use management areas are sub-units that are highly populated, receive high levels of use and are easily accessible by road. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted. The airfield and small arms complex are managed as "*limited.*" Fire protection category for Main Post is "*critical,*" except for the small arms complex, which is "*limited.*" "*Critical*" areas receive maximum detection coverage and are highest priorities for attack response. Immediate and aggressive initial attack is provided. Critical management areas receive priority over adjacent lands and resources in the event of escaped fires.

Table 4-6. Fort Wainwright Main Post Ecosystem Management Prescriptions.

Ecosystem Management Sub-unit	Natural Resource Management Priorities	Fire Suppression Categories	Vegetation Management	Hunting and Trapping	Fishing	Recreational Use Management
Local Training Areas	High use	Critical	Army	Open/closed***	Open	Modified**
Urban Areas	High use	Critical	Army	Closed*	Open	Limited
Airfield	Limited	Critical	Army	Closed	Closed	Closed
Small Arms Complex	Limited	Limited	Army	Closed	Closed	Closed

* Trapping open in the Chena River with Alaska Department of Fish and Game permit
**Except for ATV special use management area, which is open for ATVs.
*** Open to hunting closed to trapping

Fort Wainwright Main Post is not an approved federal or state subsistence area. There is no subsistence preference for any subsistence user, but any subsistence user may conduct approved subsistence activities after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and executive orders pertaining to natural resources management on Fort Wainwright Main Post. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of the National Environmental

Policy Act, Geographic Information System, and other decision support systems, and integration with other land management programs such as the Sustainable Range Program and the Sustainment, Restoration and Modernization Program.

4.2.6.3 Access

Public access in the Main Post is allowed for recreation subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander.

4.2.6.4 Outdoor Recreation

Local training areas and urban areas are "*closed"* to trapping, and urban areas are "*closed*" to both hunting and recreational trapping, except in the Chena River with an approved Alaska Department of Fish and Game permit. Local training areas and urban areas are open to fishing, while the airfield and small arms complex are "*closed*" to fishing. Recreational use category is "*modified*" in the local training areas, except for a special use management area, which is "*open*" to all terrain vehicles. Recreational use category is "*limited*" for urban areas and is "*closed*" for the airfield and small arms complex.

Off-road recreational vehicles use on Main Post is restricted to areas north of the Chena River, except as the authorized route from Raven's Roost Storage yard to the Bailey bridge across the Chena River. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs or less unless specified by the DPW Conservation Branch or the DES Conservation Section and there is no potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. Vehicles with a GVWR greater than 1500 lbs are restricted to improved roads, unless authorized by the Garrison Commander. Motorized watercraft must stay in existing open water channels. The closed use area includes all areas within 100 Meters of all structures and permanently closed off-limit areas.
Figure 4-2 shows recreation use areas on Fort Wainwright Main Post.

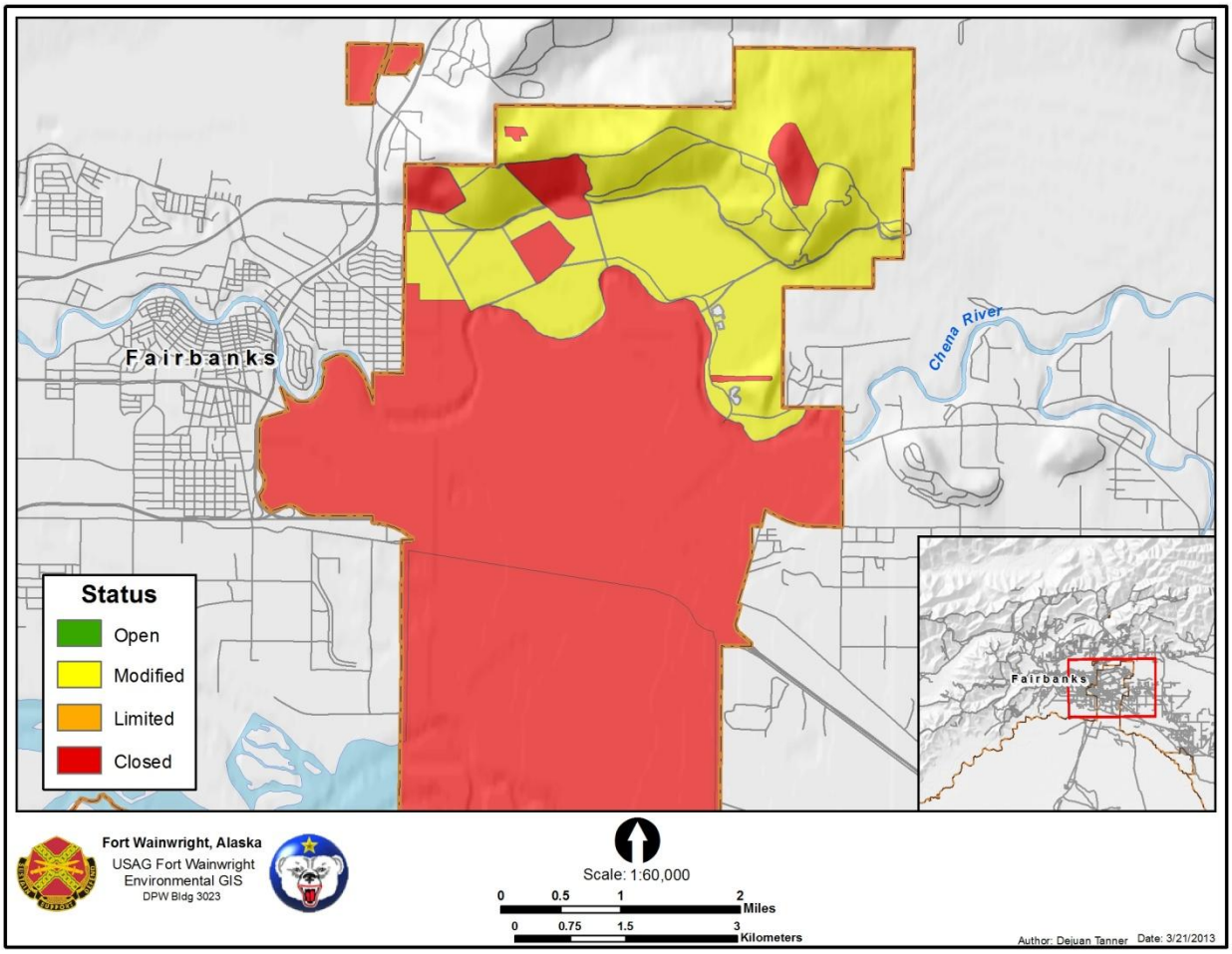


Figure 4-2. Fort Wainwright Main Post Recreation Use Areas.

4.2.7 Main Post Projects

Table AC-1 lists example ecosystem management projects for Fort Wainwright Main Post.

4.3 Fort Wainwright Tanana Flats Training Area Ecological Management Unit

4.3.1 Location

Tanana Flats Training Area is located in central Alaska, north of the Alaska Range in the Tanana River Valley. The training area lies 120 miles south of the Arctic Circle near the cities of Fairbanks and North Pole in interior Alaska in the Fairbanks North Star Borough. The Tanana Flats Training Area ecological management unit is located south of the Tanana River from Fort Wainwright. This area contains approximately 630,000 acres of land and is bordered on the north and east by the Tanana River, on the west by the Wood River, and on the south by the 34 grid line. Tanana Flats Training Area ecological management unit consists of Tanana Flats Training Area, Alpha and Blair Lakes Impact Area, and Dyke Range. Figure 4-3 shows the location of Tanana Flats Training Area.

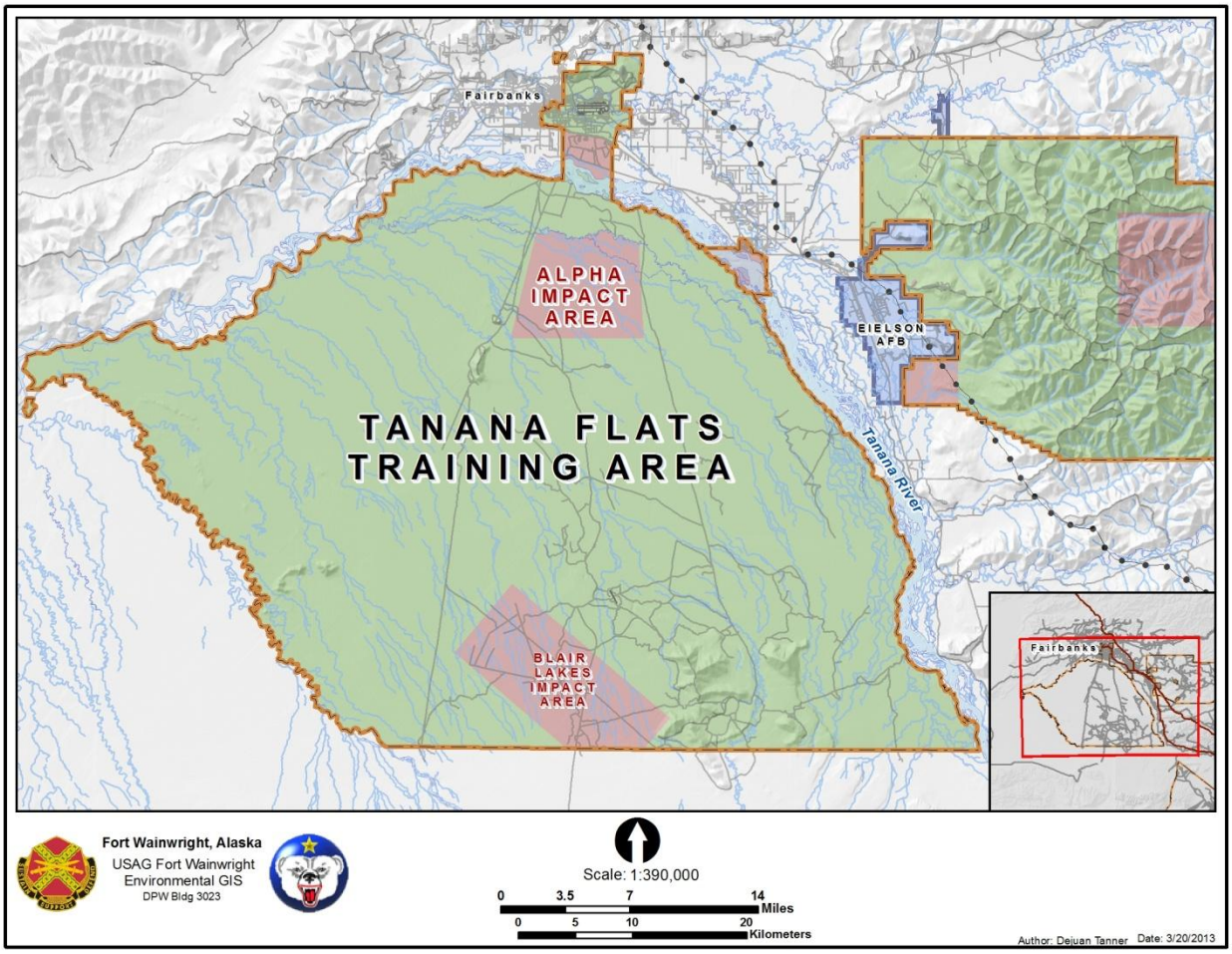


Figure 4-3. Fort Wainwright's Tanana Flats Training Area.

4.3.2 Tanana Flats Training Area Facilities

4.3.2.1 Ranges

The Tanana Flats Training Area (TFTA) is located south of the Richardson Highway from FWA. This

area contains approximately 646,507 acres of training area of which 55,738 acres are impact area. The TFTA is bordered on the north and east by the Tanana River, on the west by the Wood River and on the south by the 34 grid line.
The terrain is generally muskeg bog with limited high ground around Blair Lakes, Wood River Buttes, Clear Creek Butte and Salmon Loaf. Access during the summer is limited to air and boat since no bridges span the Tanana River in this area. In the winter an ice bridge can be constructed across the river and the entire area is then accessible. A hasty C130 airstrip is located in the southern area (Clear Creek Assault Strip) as well as an airstrip adjacent to Blair Lakes; however, these strips require engineer work before use by large aircraft. Training facilities in the TFTA include: 4 LZ's on Clear Creek Butte and Salmon Loaf, 3 FP's, three DZ's, the Blair Lakes Range complex, and 8 unimproved LZ's around Wood River Buttes, Dry Creek, and McDonald Hills.

4.3.2.2 Transportation System

Tanana Flats Training Area is not accessible by any roads or railroads. A bridge and trestle is currently being constructed by the Alaska Railroad which will cross the Tanana River in the vicinity of Tom Bear Road. The intent of this crossing is to provide a rail connection from Fairbanks to Delta Junction. The completion date of this project is currently unknown. At present during the summer months, access can only be accomplished by boat or by air at the Clear Creek Assault Strip. During the winter months, an ice bridge is may be constructed across the Tanana River and allows vehicle access.

4.3.3 Physical Resources

4.3.3.1 Topography

The Tanana Flats Training Area lies within the Tanana-Kuskokwim lowland north of the Alaska Range, within the drainage of the Tanana River. This depression was subsiding as the Alaska Range was rising to the south, and filling with sediments from those mountains. The area is bounded by uplands to the north, the Alaska Range to the south, and consists of alluvial fans extending northward from the mountains. The Tanana River flows along the northern edge of the lowland. The terrain is generally flat lowland, ranging from 128 to 512 feet above sea level (Nakata Planning Group 1987). Elevation gradients range from 40 to 50 feet/mile along upper portions of fans, to 6 to 7 feet/mile in the Tanana Flats (Racine et al. 1990).

4.3.3.2 Geology

Central Alaska has not been glaciated, but during glacial advances, glaciers surrounded the area. Climatic fluctuations during the Quaternary Period caused glacial expansion and recession (Racine and Walters 1991). Rivers flowing from glaciers deposited several hundred feet of silt, sand, and gravel in the Tanana and Yukon valleys. Most of the area is covered by a layer of loess ranging from several inches to more than 128 feet thick. Gravel deposits along the Tanana River are up to 154 feet thick and are a significant source of groundwater (Nakata Planning Group 1987).

4.3.3.2.1 Seismicity

Earthquakes to the west of the training area are associated with the Fairbanks seismic zone, another northeast-trending band of activity. An average of five or six earthquakes a year are actually felt in this zone, and swarms of micro-earthquakes occur (Page et al. 1991). In 1967, a series of three earthquakes of about magnitude 6 had epicenters to the west of Tanana Flats Training Area. Two other moderate (magnitude 4.0-4.6) quakes occurred in this zone in 1997 (U.S. Geological Survey National Earthquake Information Center 1998; Alaska Earthquake Information Center 1998).

4.3.3.2.2 Petroleum and Minerals

Mineral resources management on Tanana Flats Training Area is the responsibility of the Bureau of Land Management. Measures to safeguard resource values outlined in 43 CFR 3100, 43 CFR 3600, and 43 CFR 3809 apply to mineral development on withdrawn lands. Under terms of the Defense Appropriations Act of 2000, should withdrawn lands be opened to mineral location, mineral patents could convey title to locatable minerals only. These patents would also carry the right to use as much of the surface as necessary for mining under guidelines established by the Secretary of the Interior by regulation (Bureau of Land Management and U.S. Army 1994).

4.3.3.3 Soils

Tanana Flats Training Area comprises different units of unconsolidated material, distributed in broad basins and elongated meander scars. Deposits grade from coarse gravel at heads of fans nearest the Alaska Range, to sand and silt at the bases of fans in the northern part of the basin. Coarse sediments on upper fans are well drained, but fine-grained sediments of lower fans are poorly drained. Frozen ground is within 20 inches of the surface in places and nearly 128 feet thick. Permafrost is absent beneath rivers and lakes, but is common wherever surface water or circulating groundwater is absent (Racine et al. 1990).

4.3.3.4 Water Resources

4.3.3.4.1 Surface Water

Tanana Flats Training Area is drained by several streams including: Wood River, Crooked Creek, Willow Creek, Clear Creek, McDonald Creek, and Bear Creek, which all drain into the Tanana River directly or by way of Salchaket Slough. Lakes and ponds are numerous on Tanana Flats Training Area, many of which freeze solid during the winter. Only a few are stocked by the Alaska Department of Fish and Game. Blair Lakes are the largest lakes on Tanana Flats Training Area.

The volume of flow fluctuates dramatically by season. During the long period of freeze, usually from October to May, flow is limited to seepage of groundwater from aquifers into streams. Many small streams freeze solid (zero discharge) during winter. Snowmelt typically begins in March or April and reaches its peak in June. Flow is greatest during June and July. By the end of July, most snow has melted, and a steady flow during August and September is sustained by rainfall (Nakata Planning Group 1987).

4.3.3.4.2 Groundwater

Groundwater is one of Tanana Flats Training Area's most valuable natural resources. With the exception of naturally occurring metals, groundwater quality is good in the Tanana Flats Training Area. Much of Tanana Flats Training Area is underlain by an alluvial aquifer. Groundwater potential is best along the alluvium of the Tanana River, where wells are capable of yielding 3,000gpm at less than 200 feet in depth. Groundwater in the Tanana Flats Training Area tends to have relatively high, naturally occurring levels of metals, especially iron and arsenic. (Harding Lawson Associates 1996).

4.3.3.5 Climate

Tanana Flats Training Area has the northern continental climate of the Alaskan Interior, which is characterized by short, moderate summers; long, cold winters; and little precipitation or humidity. Weather is influenced by mountain ranges on three sides, which form an effective barrier to the flow of warm, moist, maritime air during most of the year. Surrounding uplands also cause settling of cold, Arctic air into Tanana Valley lowlands.

Average monthly temperatures in Tanana Flats Training Area 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. The average frost-free period is 95-100 days.

Prevailing winds are from the southwest in June and July, and from the north and northeast in winter. Average wind velocity is 5.3 miles per hour (mph). The greatest average wind speed is in spring, with a high of 40 mph recorded in Fairbanks. Winds are 5 mph or less 60% of the time. Thunderstorms are infrequent, occurring only during late spring and early summer.

Average annual precipitation is 10.4 inches, most of which falls as rain during summer and early fall. Average monthly precipitation ranges from a low of 0.29 inches in April to a high of 1.86 inches in July. Average annual snowfall is 67 inches, with a record high of 168 inches during the winter of 1970-71. Average annual relative humidity is 55%, with lowest levels during spring and early summer (38% during mid-afternoon in May). Heavy fog is relatively common during December and January, with four or five foggy days each month. Ice fog can be expected any time temperatures drop below -30°F, but it is normally restricted to areas near human settlements where moisture is emitted from burning fuels (Bonito 1980).

4.3.4 Biological Resources

4.3.4.1 Flora

Tanana Flats Training Area encompasses a large amount of land with a wide array of physiographic features. Vegetation patterns are influenced by climate, soil, topography (slope, aspect, and elevation), depth to water table, permafrost, and fire. Tanana Flats Training Area has three vegetation types: treeless bogs, open, low-growing spruce forests, and closed spruce-hardwood forests. The white spruce-paper birch forest of interior Alaska is often called the boreal forest or taiga. Vegetation types of interior Alaska form a mosaic and reflect fire history, slope and aspect, and presence or absence of permafrost (Viereck and Little 1972).

4.3.4.1.1 Vegetative Profile

A typical vegetation profile from lowland, up a south slope, and down the north slope, would include the following: water, barren, high brush, deciduous forest, white spruce forest, moist tundra, black spruce forest, and mixed forest (Bonito 1980). This profile does not precisely match Viereck and Little's (1972) vegetation types, which were mapped on a statewide scale. Wetland occurs at various altitudes and sometimes only during early successional stages. Localized conditions often result in various combinations of vegetation.

A typical vegetation profile from the Wood River/Tanana-Blair Lakes Uplands to the Rosie Creek/Tanana River floodplain includes: barren areas (rock and gravel), south-facing xeric steppe-like communities, Upland/Riverine/Lowland forests (needleleaf, deciduous, and mixed), open moist forests, open/woodland forest thermokarst bogs, riverine tall shrubs, scrub shrub bogs/muskegs, emergent wetlands, barren, and water (Anonymous 1979; Bonito 1980).

4.3.4.1.2 Floristics Inventory

During 1995-1996, the Cold Regions Research Engineering Laboratory conducted a floristic inventory for Fort Wainwright at Fort Wainwright, including Tanana Flats Training Area (Tande et al. 1996). The inventory focused on vascular plants, so cryptogams (i.e., mosses and lichens) were not identified. The inventory found 491 taxa (including subspecies and varieties), representing 227 genera in 72 families. This is about 26% of Alaska's vascular flora. At least 10 taxa collected represented extensions of known

ranges (Tande et al. 1996). Plants were collected from five units within the Tanana Flats of the Tanana-Kuskokwim Lowland.

Plants were collected from 51 plots of the Tanana Flats Lowlands. A total of 1,005 collections were made at 123 sites within Fort Wainwright Army Lands. Center for Environmental Management of Military Lands mounted three sets of collected plants. One set was laminated and remains at Fort Wainwright, and the other two are dry mounted and stored at the University of Alaska Museum, Fairbanks.

From 2001-2011 the Range Training Land Assessment program increased the taxa list to 512 for Yukon-Tanana Upland Region. Also a ground truth survey was conducted in 2008-2010 to provide additional data on common cluster plant community groups(Viereck 1992, Level 5) associated with the land cover types (Viereck 1992, Level 4) their found in, over 3,240 plots were sampled in the flats.

4.3.4.1.3 Threatened or Endangered, and Species of Concern Plants

The Tanana Flats Ecological Management Unit has 6 vascular plant species of concern that are known to occur within the area. These plants are being tracked by the Alaska Natural Heritage Program because they are thought to be uncommon or rare in Alaska and/or uncommon or rare globally (Alaska Natural Heritage Program 2011). These species are listed below in table 4-7 and are documented in the survey results of Tande et al. (1996). Due to access and sheer vastness, the Tanana Flats is difficult to survey for species of concern and would be hard to know if any other species listed under the Alaska Natural Heritage Program is present in this particular region.

Table 4-7. Tanana Flats Training Area Rare Plant Species.

Species	Common Name	Global Ranking*	Alaska Ranking**
Artemisia laciniata	siberian wormwood	G4?	S3
Cicuta bulbifera	bulblet-bearing wáter hemlock	G5	S3
Glyceria pulchella	MacKenzie valley mannagrass	G5	S3S4
Lycopus uniflorus	northern bugleweed	G5	S3S4
Rorippa curvisiliqua	curvepod yellowcress	G5	S1S2
Rosa woodsii var. woodsii	wood's rose	G5T5	S2S3

* Alaska Natural Heritage Program Rare Species Global Rankings
G3 Either very rare and local throughout its range or found locally in a restricted range (typically 21-100 occurrences)
G4 Apparently secure globally
G5 Demonstrably secure globally
G#G# Global rank of species uncertain; best described as a range between the two ranks
G#T# Global rank of species and global rank of the described variety or subspecies of the species Q Taxonomically questionable
? Inexact

** Alaska Natural Heritage Program Rare Species State Rankings
S1 Critically imperiled in state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state (typically 5 or fewer occurrences, or very few remaining individuals or acres)
S2 Imperiled in state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (typically 6 to 20 occurrences, or few remaining individuals or acres)
S3 Rare or uncommon in the state (typically 21-100 occurrences)
S4 Apparently secure in state, with many occurrences
S#S# State rank of species uncertain; best described as a range between the two ranks
SE possibly introduced

4.3.4.1.4 Ecological Land Classification

An ecological land classification was done for Tanana Flats Training Area during 1994, 1995, and 1998. This report included mapping by geomorphology, permafrost, vegetation, ecotypes, ecosubdistricts, and ecodistricts (Jorgenson et al. 1999). The ecological land classification is a hierarchical means to classify land according to various ecological scales. In 2008-2010 a ground truth survey was implemented to provide accurate data for land cover types, over 3,240 points were sampled. The ecological land classification mapping was reedited in 2011 after the initial report to update classification changes, mainly disturbances including urban/training land development and wildfires.

The Tanana Flats ecological management unit contains portions of the Tanana Floodplain ecodistrict and the Tanana-Wood River Flats ecodistrict. The Tanana Floodplain ecodistrict on Tanana Flats is divided into the Eielson-Tanana Floodplain, Rosie Creek-Tanana Floodplain, Salchaket Slough Floodplain, and Salchaket Slough Lowlands. The Tanana-Wood River Flats ecodistrict on Tanana Flats is composed of Clear Creek Lowlands, Willow Creek Lowlands, Crooked Creek Lowlands, Dry Creek Lowlands, Wood River Lowlands, Little Delta River Lowlands, Tanana-Blair Lake Uplands, and Wood River

4.3.4.1.5 Wetlands

The Tanana Flats Training Area contains numerous freshwater ponds, lakes, emergent wetlands, and scrub-shrub wetlands. Much of the area is underlain by shallow permafrost, though thermokarst (subsidence due to thaw of ground ice) depression are abundant. A large portion of the Flats is covered with sedge and grass-dominated floating mat that are highly dependent on mineral-rich groundwater discharge. The floating mats are composed of a dense network of roots and organic material deposited by sedges, grasses, horsetail species, and herbaceous broadleaf forbs, such as buckbean and marsh marigold. Aquatic plants, such as bladderwort and duckweed, are also frequently found in these areas. Scrub-shrub wetlands positioned on slightly higher relief surround the emergent wetlands and are also found in poorly-drained basins and depressions with cold, saturated soils. In most low-lying areas, the water table, if not exposed, is found only a few inches below the soil surface. More information on wetlands in the Tanana Flats Training Area is available in Williams' 1994 study of vegetation patterns in the Tanana Flats wetland complex. Her report describes plant species observed in five survey plots and relationships among these species.

Three separate efforts have been made to describe and map wetlands and waterbodies in the Tanana Flats Training Area. In 1992, the National Wetlands Inventory (NWI) produced a wetland and waterbody map that covered approximately 18% of the Tanana Flats Training Area. In 1998, the U.S. Army Engineer Waterways Experiment Station (WES) completed a wetland delineation of the entire Tanana Flats Training Area that included a review of existing information, a wetland identification and characterization, a base map, and a report. In 2009, HDR Alaska and Colorado Data Scapes mapped wetlands and waterbodies in a 7,236 acre parcel near Blair Lakes (approximately 1% of the entire Tanana Flats Training Area). Fort Wainwright refers to these maps for management, planning, and permitting purposes.

4.3.4.1.6 Forest Resources

A forest inventory is an integral part in establishing a plan for managing forest resources. The Tanana Flats Training Area Ecological Management Unit was inventoried by the Directorate of Public Works, Environmental Forestry Staff during the 2004 field season. Tree data was collected from permanent plots as part of an ongoing forest inventory and analysis of USARAK (Fort Wainwright) lands.

Stand Delineation and Inventory

Stand timber types were delineated utilizing aerial photography and satellite imagery to produce maps that demarcate land into forested and non-forested categories. This process was also used to help identify geographical coordinates for the plots and to establish permanent plots on the ground. Timber stands were further defined into types based on specific characteristics such as species composition, size class, and stocking. These stand types are predefined by the *Alaska Vegetation Classification system* (Viereck et al. 1992). The Fort Wainwright inventory method further stratifies out stands with higher timber value, greater ecological importance, and greater potential for military training. Stand timber typing was confirmed on the ground during stand inventory. The fixed plot radius sampling method was used for tree data collection.

Forest Land Classification and Timber Volume Summary

The Tanana Flats Training Area contains a total of 655,985 acres of forest and non-forest land (Table 4-8). Forest lands in the project area occupy 43.9% of the land area or 288,139 acres. Non-forest land amounts to 56.1 % of the total project land area or 367,946 acres. The forested lands contain 43,800 acres of commercial forestland. Commercial forest lands are those lands containing sawtimber and poletimber size classes.

The total volume found in the various types or strata is found in Table PB-3. The estimated total volume of timber in this area is 21,985,821 cubic feet of commercial value. During 2009 and 2012 consecutive fires have destroyed over a third of the flats. Before the fires there was an estimated 157,586,181 cubic feet of timber. There is 36,582,371 board feet (Scribner) and over 447,324 tons of green biomass. Also provided is potential commercial forest acerage, identified as Timberland, where Tanana Flats Training Area has 462,154 acres and of that acerage 41.9% is accessible (Acessible meaning not within restricted access or impact areas).

Table 4-8. Tanana Flats Training Area Forest Land Classification and Timber Stand Summary

Forest Category	Total Acreage	Commercial Forest Category	Land Acreage	Percent Total Acres
Forested Lands	288,139	Commercial Forest	43,800 (39,919)*	6.7% (91.1%)**
		Non-Commercial Forest	244,239	37.2%
Non-Forested Lands	367,946	Shrub/Scrubland	204,436	31.2%
		Herbaceous	34,448	5.3%
		Barren-Natural/Cultural	103,457	15.8%
		WaterBodies	25,605	3.9%
Total Cubic Feet	**21,985,821 (20,50,8670)***	**Total Acres**	**655,985 (596,878)***	**100.0% (91.0%)****
Total Board Feet	**36,582,371 (35,208,927)***	**Total Timberland Acres**	**462,154**	**70.5%****
Total Green Tons	**447,324 (416,658)***	**Accessible Timberland Acres**	**193,535**	**41.9%****

***Indicates acreage/volumes that is accessible.**
**** Percentages are deferred from accessible acreages of corresponding rows.**

Estimated Annual Harvest

An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total existing commercial forest area by the

rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The following softwood, hardwood, and mixed softwood/hardwood accessible harvest acreage represent saw, pole, and pole/saw timber types; the majority is in the pole/saw type.

Table 4-9. Tanana Flats Training Area Estimated Accessible Annual Harvest.

Harvest Timber Type	Potential Harvest Land	Rotation Age	Regeneration Time	Total Rotation Length	Estimated Annual Harvest
Softwoods	13,667 acres	110 years	10 years	120 years	114 acres
Hardwoods	11,031 acres	70 years	10 years	80 years	138 acres
Softwood/Hardwoods	15,221 acres	110	10 years	120 years	127 acres

4.3.4.2 Fauna Tanana Flats Training Area

Most vertebrate species indigenous to central Alaska can be found on Tanana Flats Training Area. Game species found on Tanana Flats Training Area are managed by Alaska Department of Fish and Game. Alaska Department of Fish and Game monitors these species to determine population status, reproductive success, harvest and home ranges. Alaska Department of Fish and Game also sets bag limits and seasons for these species. Fort Wainwright will cooperate with and contribute funds to help Alaska Department of Fish and Game monitor or study game species on an annual basis to ensure sustainable harvests, based on funding availability.

4.3.4.2.1 Bears

Black and grizzly bears are found throughout Tanana Flats Training Area. Both are hunted, although black bears are taken more often due to larger densities as reported by Alaska Department of Fish and Game (Seaton 2005 and Young 2005). In 1988 Fort Wainwright and Alaska Department of Fish and Game began a cooperative study of black bear demographics on Tanana Flats Training Area (Hechtel 1991). Between 1988 and 1991, 45 individual bears were captured 111 times. From 1988 to 1990, 29 radio-collared bears were located 916 times. Twenty-nineadult bears caught included eight adult females (mean age 12 years), nine sub adult females (mean age 3.2 years), four adult males (mean age 7.8 years), and eight sub adult males (mean age two years). Sixteen bears were offspring of collared females and followed in successive seasons. The sightability of non-denning bears during tracking flights was approximately 49%. Mean home range sizes were used to estimate densities of 46-67 bears/1,000 km^2. Forty-seven den sites were located. Fifteen den sites were in spruce habitat types, nine in birch/aspen stands, seventeen in alder/willow shrubs, six in heath meadows, and none in marshes. Availability of denning sites is not a limiting factor for this population.

In 2010, Fort Wainwright initiated a study with Alaska Department of Fish and Game to generate a population estimate for the Tanana Flats Training Area (Gardner et al. 2012). Using genetic mark-recapture, 81 black bears and 11 grizzly bears were uniquely identified. The density of black bears, 59 individuals ≥1-year-old/1,000 km^2 (SE = 7.3; 95% CI = 46–75 bears), appears stable and in keeping with the 1991 estimate. The sampling design did not capture a density estimate for the more wide-ranging grizzly bear. Gardner et al. (2012) found that black bears are concentrated around Salchaket Slough, Bear Creek, Willow Creek, and McDonald Creek. Grizzly bears were found across the study area.

Hechtel (1991) found that bear harvest appeared to be sustainable and directly linked to access, with a mean harvest of 11.2 bears/year from Tanana Flats Training Area from 1980-1990.. No serious black bear conservation problems were identified related to Tanana Flats Training Area land management. Since 1974 (when harvested black bears were first required to be sealed), black bear harvest on Tanana Flats

Training Area has varied from zero (1975) to 25 (1981). During fall, black bear harvest on Tanana Flats Training Area is primarily opportunistic by moose hunters (Hechtel 1991). Since 1974, the bag limit has been three bears annually with no closed season. Bear baiting was closed from 1977 through the 1982-83 season due to conflicts with pipeline construction activity. Since the 1983-84 season, the practice has been legal. Baiters must acquire permits from the state of Alaska and Fort Wainwright Natural Resources Office. Harvest across Game Management Unit 20 has generally been higher since re-opening of baiting, but the difference is not statistically significant (Hechtel 1991). Grizzly bears are hunted during all but summer months. The bag limit is one bear every four regulatory years. Grizzly bears may not be taken over bait. Only a few grizzly bears (0-3 annually during the past five years) are harvested from Tanana Flats Training Area. From 1997 to 2012, black bears harvested from spring baiting methods averaged 7.6 bears/year.

4.3.4.2.2 Moose

Tanana Flats Training Area is included in Alaska Department of Fish and Game's Game Management Unit 20, which supports the state's largest moose harvest. Although not considered good winter moose habitat compared to the foothills portion of Game Management unit 20A, the Tanana Flats Training Area supports year round resident moose population at moderate to high densities with the highest numbers during spring and early summer (Young 2004). Need to talk about calf production, Intensive Management Units, economic importance.

Despite, high densities of moose in the Tanana Flats and an associated high harvest rate, this population has very low productivity, indicating suboptimal moose habitat (Boertje et al. 2007). The twinning rates for GMU 20A are the lowest in Alaska, particularly for the northcentral portion of the unit, which coincides with the Tanana Flats Training Area (Young 2010, Boertje et al. 2007). This population of moose is economically important to the greater Fairbanks area. Consequently, to sustain high levels of harvest, GMU 20A has specific intensive management objectives, which include the use of antlerless hunts (Young et al. 2006, Boertje et al. 2009).

In 2010, Fort Wainwright initiated a study with Alaska Department of Fish and Game to characterize moose calving areas in Tanana Flats Training Area, according to both timing and distribution (Gardner et al. 2012). Repeat aerial observations of radiocollared moose with neonates were used to outline calving areas. One hundred thirty-eight calving sites for 90 female moose were discovered. The majority of sites were between the Wood River Buttes and Blair Lakes with peak timing from 21-25 May. More information on management of this moose herd can be found in Young 2010.

4.3.4.2.3 Wolves

The most current wolf population estimate for game management unit 20A, including Tanana Flats Training Area, is from 2005 (Young 2009). Based on radiotelemetry, aerial surveys, and harvest report there are 216-226 wolves distributed across 29 packs. According to the Alaska Department of Fish and Game, there are three wolf packs whose range may include army lands in the Tanana Flats. There are an additional three packs south of Tanana Flats on Donnelly Training Area and about four packs west of the Wood River. It is assumed that wolf populations are stable. Hunting is allowed during the normal state season for Unit 20 from August through April with a bag limit of five. Trappers may take an unlimited number of wolves during the trapping season. Wolves are currently monitored by Alaska Department of Fish and Game to determine population size, home range, and effects on prey species.

4.3.4.2.4 Small Mammals

Small mammals play important ecological roles as secondary consumers and as prey for a variety of predators. The Alaska tiny shrew (*Sorex yukonicus*) is newly described and apparently rare, found in small numbers in widely separated parts of Alaska. Currently, little information exists regarding species and densities. Survey-inventory activities will be implemented under ADF&G guidelines and regulations.

4.3.4.2.5 Furbearers

Many Alaskan mammal species are listed as furbearers by the Alaska Department of Fish and Game. Population monitoring, trapping seasons and bag limits are set by Alaska Department of Fish and Game.

Given the secretive nature of furbearers, determining population information can be challenging and unfeasible. At this time, population estimation is non-existent. Consequently, managers rely on harvest reports, sealing data, and trapper observations/perceptions to gauge the status of certain furbearers. As a result, management goals tend to be very broad (such as ADFG's management goals for all of GMU 20) and shy away from setting harvest totals. There are sealing requirements for lynx, wolverine, river otter, and beaver; therefore, some population information can be collected such as sex ratios. There are no sealing requirements for coyote, ermine, marten, mink, muskrat, red fox, or red squirrel.

The majority of furbearer population information comes from trapper questionnaires and biologists observations. Regular communication with trappers is critical for monitoring population cycles of furbearers and their prey as well as trapping pressure. To improve our knowledge of furbearer populations on Fort Wainwright, we require trappers to complete trapper questionnaires at the end of the trapping season. We will continue tracking the harvest of furbearers on military lands but also work to increase comments from trappers on furbearer populations and trapping conditions.

4.3.4.2.6 Threatened, Endangered, or Rare Fauna

The American peregrine falcon (*Falco peregrinus anatum*) was recently de-listed from endangered species status. Though not known to nest on Tanana Flats Training Area, it is an infrequent migrant. Potential peregrine falcon habitat for feeding or nesting can be found in the Salcha Bluff area (Ritchie and Rose 1998).

The bald eagle is locally common and the golden eagle (*Aquila chrysaetos*) is a resident of forest and alpine habitats of the installation (Nakata Planning Group 1987).

Seven birds are listed as state-sensitive (Fort Wainwright and Center for Ecological Management of Military Lands 2011), the gray-cheeked thrush (*Catharus minimus*), blackpoll warbler (*Dendroica striata*), American peregrine falcon, golden eagle, olive-sided flycatcher (*Contopus cooperi*), Arctic peregrine falcon (*Falco peregrinus tundrius)*, and Townsend's warbler (*Dendroica townsendi)*. The gray-cheeked thrush was noted in recent surveys (Bureau of Land Management and U.S. Army 1994). All but the Arctic peregrine falcon have been confirmed on Fort Wainwright (USARAK and the Center for Ecological Management of Military Lands 1999).

A number of species confirmed on Fort Wainwright are included on the Boreal Partners in Flight Working Group (2005) as target or priority species for monitoring because of declines in populations noted across the Americas. There are no legal requirements to manage these species although all migratory bird species are afforded some protection under the Migratory Bird Treaty Act.

Rusty Blackbirds (*Euphagus carolinus*) have shown a chronic population decline in recent decades. The wetlands of interior Alaska are important breeding areas for this species, and may be one of their last strongholds. During the breeding season, they use moist woodlands, bushy bogs, wooded edges of watercourses, and possibly the edges of thermokarst ponds (Andres 1999 and Avery 1995).

4.3.4.2.7 Waterbirds

During migration periods, more than 300,000 sandhill cranes (*Grus canadensis*) and 20,000 geese, ducks, and swans pass through the Delta area. The wetland complexes, ponds and lakes of the Tanana Flats Training Area may provide important staging sites for some migrating waterbirds. During the breeding

season, documented trumpeter swan adult and cygnet counts, as determined from aerial surveys, have fluctuated considerably among years, however the long-term trend (1978-2006) clearly indicates a steady increase in both age classes, consistent with interior Alaska as a whole (Groves 2009)

4.3.4.2.8 Fish

The Tanana River supports king (*Oncorhynchus tshawytscha*), chum (*O. keta*) and coho (*O. kisutch*) salmon, Arctic grayling (*Thymallus arcticus)*, whitefish (*Prosopium* and *Coregonus spp.)*, longnose suckers (*Catostomus catostomus)*, sheefish (*Stenodus leucichthys)*, burbot (*Lota lota)*, pike (Esox lucius), and sculpins (*Cottus spp.)*. Blair Lakes, Tanana and Wood Rivers, Salchaket Slough and Bear, McDonald, 5-mile Clearand Clear Creeks have the best potential fish habitats in the Tanana Flats drainage.

In 2008 and 2009, Hander and Legere (2012) conducted an inventory of anadromous and resident fish species for several waterways in the Tanana Flats: Clear Creek, Willow Creek, and Wood River. This work resulted in Clear Creek being nominated to the state *Catalog of Waters Important for Spawning, Rearing, or Migration, of Anadromous Fishes.* Other anadromous waters in the Tanana Flats Training Area include 5 mile Clear Creek and portions of Bear and McDonald Creeks.

4.3.4.2.9 Reptiles and Amphibians

The wood frog (*Rana sylvestris*) is the only amphibian residing in the interior of Alaska. There are no reptiles. Declines in amphibian populations are being recorded worldwide and in Alaska. Deformities in frogs are becoming more manifest, and reasons for the deformities are still unclear. In addition to morphological deformities, amphibians worldwide are affected by a fungus (*Batrachochytrium dendrobatidis)* that causes chytridiomycosis. This infectious disease inhibits absorbtion of water through the skin, resulting in deadly electrolyte imbalances. Scant information is available on wood frog densities in interior Alaska.

4.3.4.2.10 Special Status Fauna

No federally listed threatened or endangered animals rese on Tanana Flats Training Area. The U.S. Fish and Wildlife Service, Division of Migratory Bird Management maintains a list of *Migratory Birds of Management Concern*. Alaskan species of management concern occurringon Tanana Flats Training Area include the trumpeter swan, common loon (*Gavia immer*), northern harrier (*Circus cyaneus*), northern goshawk (*Accipiter gentilis*), olive-sided flycatcher, alder flycatcher (*Empidonax alnorum*), gray-cheeked thrush, blackpoll warbler and rusty blackbird (*Euphagus carolinus*).

Nineteen bird species found on Tanana Flats Training Area are exhibiting continentcontinent wide population declines, and have been delineated as target or priority species for monitoring by the Boreal Partners in Flight Working Group. There are no legal requirements to manage these species although all migratory bird species are afforded some protection under the Migratory Bird Treaty Act.

There are sixteen species on the Fort Wainwright Ecosystem Management List for Tanana Flats Training Area. These are olive-sided flycatcher, lesser yellowlegs, Wilson's snipe, rusty blackbird, upland sandpiper, varied thrush, little brown bat, blackpoll warbler, Wilson's warbler, greater scaup, lesser scaup, northern waterthrush, Townsend's warbler, western wood peewee, great gray owl, and white-winged crossbill.

4.3.4.3 Special Interest Management Areas

Tanana Flats Training Area has several areas with special natural features. They harbor sensitive or unique wildlife species or represent unique plant communities. The following are special area categories

and accompanying restrictions. Most areas have been digitized in the Geographic Information System, and maps showing restricted areas are available to project planners.

4.3.4.3.1 Wood River and Clear Creek Buttes

Buttes near Blair Lakes and along the Wood River have cultural and ecological significance. Many of these buttes have cleared helicopter pads for military training, especially since they are on high, relatively dry ground. These buttes will be placed off-limits to ground and vegetation-disturbing activities with exception of existing helicopter pads. This restriction should not impact military training since most missions on buttes require vegetative cover for concealment.

4.3.4.3.2 Moose Calving Areas on Tanana Flats

Alaska Department of Fish and Game has identified six parcels on Tanana Flats Training Area as important moose calving areas from 15 May through 30 June annually. The Army has agreed with Alaska Department of Fish and Game (U.S. Army 1986) to conduct operations in such a manner that will not adversely affect calving in these parcels between 15 May and 30 June. Because virtually no training occurs on Tanana Flats Training Area during warm months moose calving has not been hindered by the military.

4.3.4.3.3 Waterfowl Migratory Bird Area

The area between Willow Creek and Crooked Creek (Training Area 204) in Tanana Flats Training Area has many high function floating mat wetlands, which provide high quality habitat for many migratory birds. This area is placed off limits to all recreational vehicles use during the summer non-frozen months. There are no restrictions on hunting, trapping and fishing.

4.3.5 Tanana Flats Cultural Resources

Less than two percent of Tanana Flats Training Area has been surveyed for archeological sites. Over 140 archaeological sites are known from this training area. Three districtsand eighteen sites have been determined to be eligible for inclusion in the National Register of Historic Places by the Army and State Historic Preservation Officer.

Surveys have been generally very site specific, often required for planned construction projects. Most sites have been found on elevated buttes and on the shores of lakes. Only a relatively small portion of Tanana Flats Training Area has high sensitivity with regard to cultural resources, including the Blair Lakes Bombing Range and Maneuver Area portions. Sites dating to the late Pleistocene have been found buried deeply by windblown sand in the hills around Blair Lakes.

4.3.6 Tanana Flats Training Area Management Prescriptions

Tanana Flats Training Area ecological management sub-units include Tanana Flats Maneuver Area sub-unit (Training Areas 201, 205, 206, 207 and 208), Tanana Flats Fen Area sub-unit (Training Areas 202 and 203), Tanana Flats Special Interest Area sub-unit (Training Area 204), Dyke Range, Maneuver Area sub-unit, Alpha Impact Area sub-unit, and Blair Lakes Bombing Range sub-unit.

4.3.6.1 Military Use

Access during summer to all Tanana Flats Training Areas is limited to air and boat since no bridges span the Tanana River in this area. In the winter, an ice bridge can be constructed across the river making almost the entire area trafficable. Tanana Flats Training Areas are suitable for platoon, company, battalion and brigade-sized exercises and bivouacs, air-mobile operations, and ski and road marches in winter. These training areas are is suitable for air-mobile operations and foot training in summer. Willow Island

Research Site is off-limits to military maneuver training. Activities that are not compatible with these training areas include mechanical digging in wetlands without a permit from the Corps of Engineers, and any permanent, nonmilitary structures, easements, or leases.

Alpha and Blair Lakes Impact Areas are suitable for indirect fire weapon training and aerial gunnery exercises. These areas are impacted by small arms and dud producing munitions and are the ground and associated airspace within Tanana Flats used to contain fired or launched ammunition and explosives and resulting fragments, debris, and components from various weapon systems. Maneuver training, travel, and other military training is prohibited in this unit due to the hazard of unexploded ordnance. Activities that are not compatible with the Alpha Impact Area and Blair Lakes Impact Area include any on-the-ground natural resources management, mechanical digging in wetland without a permit from the Corps of Engineers, hunting, fishing, trapping, bird watching, off-road recreational vehicles and motorized watercraft, dog mushing, airboats, camping, new construction, easements, or leases.

4.3.6.2 Natural Resources Management

Fort Wainwright manages all Tanana Flats Training Area sub-units as "*modified*" natural resources management areas, except for the impact areas, which are managed as "*limited*". Modified management areas are areas that receive use, are not accessible by road, but are open to public access. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted, but may not be practical. Limited management areas are sub-units where public access is prohibited. Methods of ecosystem management will concentrate on remote monitoring and passive means of conducting management. Fire protection option for all Tanana Flats Training Area sub-units is "*limited*" protection. This option recognizes areas where natural fire is important or the values at risk do not warrant the expense of suppression. Limited management areas receive routine detection effort. Attack response is based on needs to keep the fire within Limited management areas and to protect individual Critical management sites within Limited management areas. Unmanned fires are monitored. The Bureau of Land Management retains vegetation rights in all of Tanana Flats except for Dyke Range, where vegetation rights are controlled by the Army. Tanana Flats sub-units and their corresponding management options are shown in Table 4-12.

Table 4-10. Tanana Flats Training Area Ecosystem Management Prescriptions.

Ecosystem Management Sub-unit	Natural Resource Management Priorities	Fire Suppression Category	Vegetation Management	Hunting and Trapping	Fishing	Recreational Use Management
Training Areas 201, 205, 206, 207 and 208	Modified	Limited	BLM	Open	Open	Open
Training Area 202 and 203	Modified	Limited	BLM	Open	Open	Open*
Training Area 204	Modified	Limited	BLM	Open	Open	Limited
Dyke Range	Modified	Limited	Army	Open	Open	Limited
Alpha Impact Area	Limited	Limited	BLM	Closed	Closed	Closed
Blair Lakes Impact Area	Limited	Limited	BLM	Closed	Closed	Closed

*Between 1 April and 15 July, training areas 202 and 203 are off limits to all motorized vehicles.

Fort Wainwright manages the Tanana Flats Training Area Alpha and Blair Lakes Impact Areas as "*limited*" management areas. Alpha and Blair Lakes Impact Areas are *"closed"* to hunting and trapping. Recreational Use category is "*closed"*.

Clear Creek and Wood River Buttes, Moose calving areas, and Training Area 204 (Willow Creek/Crooked Creek Migratory Bird Area) are managed as special interest areas. Recreation Use category is "limited". Access into Training Area 204 remains closed to all motorized vehicles from 1 April – 30 October.
Tanana Flats Training Area is not an approved federal or state subsistence area. Tanana Flats Training Area is a traditional hunting area for upper and middle Tanana tribes. There is no subsistence preference for any subsistence user but any subsistence user may conduct approved subsistence activities after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and Executive Orders pertaining to natural resources management on Tanana Flats Training Area. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of National Environmental Policy Act, Geographic Information System, and other decision support systems, and integration with other land management programs such as Sustainable Range Program and Sustainment, Restoration and Modernization Program.

4.3.6.3 Access

Public access in the Tanana Flats Training Area is allowed for recreation subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander. Authorized users must obtain a free recreation access permit (RAP) and check- in using the USARTRAK system (www.usartrak.com)and obtain information on temporary closures for military training.

Access into the Alpha Impact Area and Blair Lakes Impact Area is prohibited. Military personnel may request permission to enter the sub-unit and if granted, they must be accompanied by Explosive Ordnance Disposal personnel. There is no public access allowed in the Alpha Impact Area and Blair Lakes Impact Area or impact area buffer because of the risk of unexploded ordnance.

4.3.6.4 Outdoor Recreation

All Tanana Flats sub-units are "*open*" to hunting, fishing and trapping during seasons established by Alaska Department of Fish and Game, except the impact areas, which are always "*closed*". Fort Wainwright has the authority to further restrict the ADFG regulations on FWA land. Further restriction on the harvest of any species or area specific closures will be indicated in the USAG FWA 190-13 Outdoor Recreation Regulation Supplement.

The Recreation use category for Training Areas 201, 202, 203, 205, 206, 207, and 208 is "open". Off-road recreational vehicles under 1500 pounds are permitted on established trails unless there is 12 inches of

ground frost and six inches of snow pack on the ground when they can move anywhere across country. Off-road recreational vehicles larger than 1500 pounds are not permitted in Tanana Flats Training Area except when there are 12 inches of ground frost and six inches of snow pack on the ground when they are restricted to established trails. Outside of Training Areas 202 and 203, motorized watercraft are permitted but must stay within open water channels. Recreation use areas on Tanana Flats Training Area is shown in Figure 4-4.

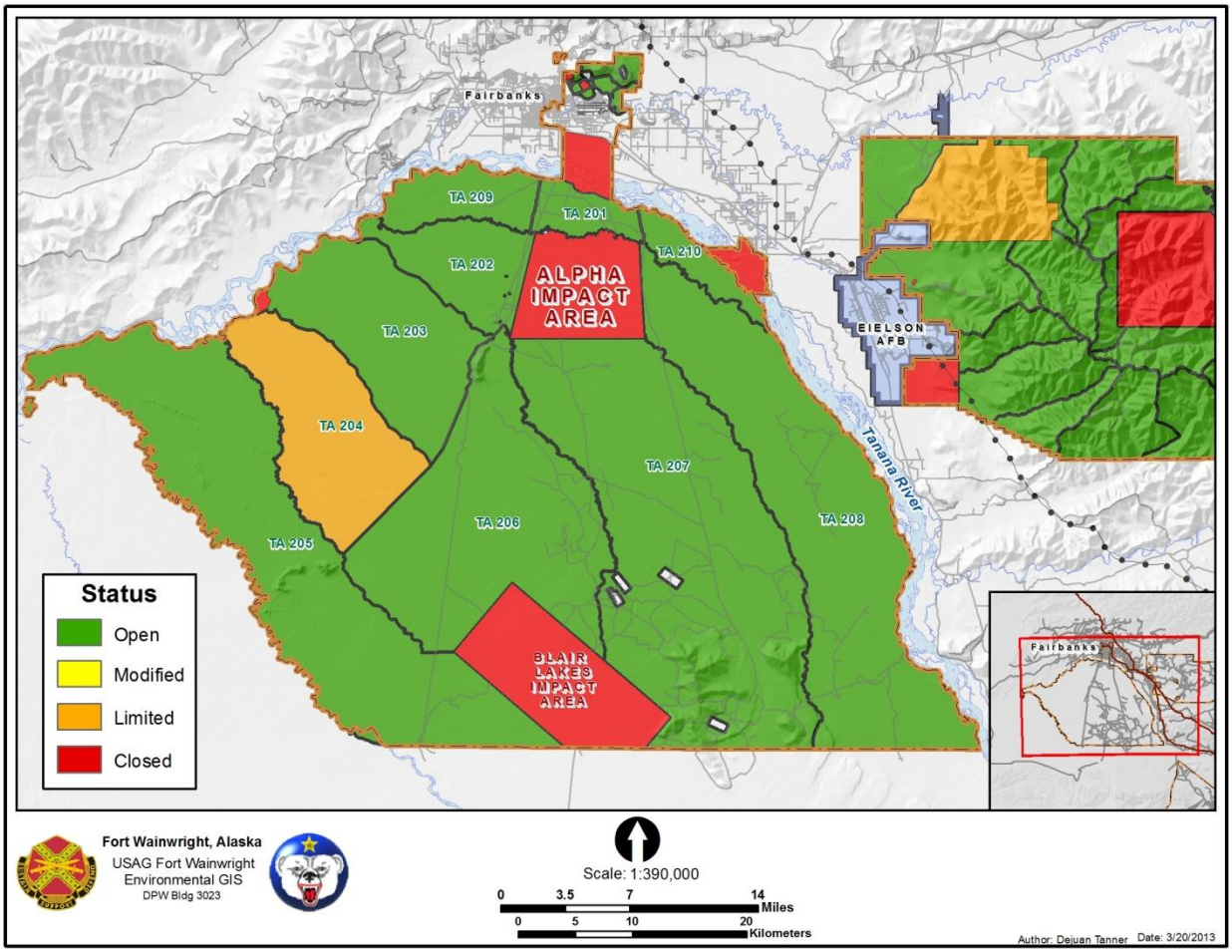


Figure 4-4. Tanana Flats Training Area Recreation Use Areas

Recreational use of off-road recreational vehicles in the Tanana Flats Training Area is allowed for vehicles less than 1500 lbs GVWR only. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs or less unless specified by the Directorate of Public Works Conservation Branch or Conservation Law Enforcement and there is no potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. No off-road recreational vehicles over 1500 lbs GVWR are allowed in the Tanana Flats Training Area at any time without a special use permit. Motorized watercraft must stay in existing open water channels.

There is no recreational activity of any type permitted in the Alpha Impact and Blair Lakes Impact Areas, within 100 Meters of any structures/towers and those other permanently closed/off-limit areas.

The area bordered by the Salchaket Slough, Bonnifield Trail, Willow Creek, and the Tanana River is open to off-road recreational vehicles and motorized watercraft use. Vehicles over 1500 lbs GVWR must stay on improved roads. Access to the fens (both upper and lower swamps) by off-road recreational vehicles

motorized watercraft is not permitted from 1 May to 15 July. Access to the lower fen (Training Area 202) and upper fen (Training Area 203) is managed separately based on water levels. Water level determination will be made by the Directorate of Public Works Conservation Branch. Access by off-road recreational vehicles (less than 1500 lbs GVWR) and motorized watercraft is permitted from 16 August to 31 March with no restrictions.

Tanana Flats Training Area 204 will remain closed to all off-road recreational vehicles and watercraft between 1 May and 30 October each year.

4.3.7 Tanana Flats Training Area Projects

Projects are in appendix A.

4.4 Fort Wainwright Yukon Training Area Ecological Management Unit

4.4.1 Location

The Yukon Training Area is 16 miles east-southeast of Fairbanks, adjacent to Eielson Air Force Base. The Yukon Training Area is roughly rectangular, stretching 28 miles east-to-west and 17.5 miles north-to-south. Yukon Training Area encompasses much of the land between the Chena and Salcha rivers, northeast of the Richardson Highway (Bureau of Land Management and U.S. Army 1994) almost 260,000 acres. The Chena River State Recreation Area lies adjacent to Yukon Training Area's northern boundary and is managed for public recreation. Eielson Air Force Base adjoins the western boundary of the Yukon Training Area. The Tanana Valley State Forest lies north of Fort Wainwright with private and Fairbanks Northstar Borough-owned land parcels to the south. Parcels of native-owned land also border Yukon Training Area. Yukon Training Area is shown in Figure 5-5.

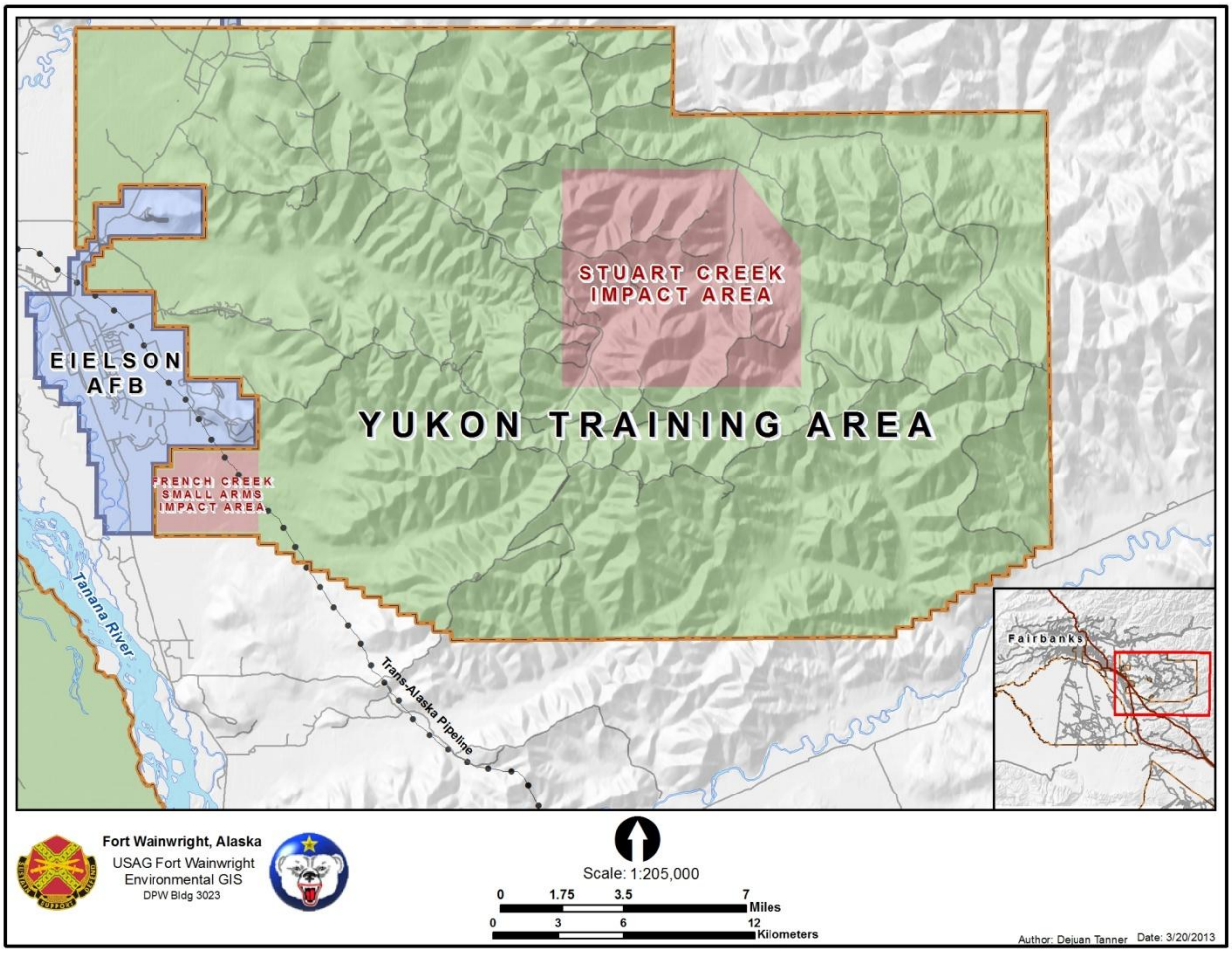


Figure 5-5. Fort Wainwright's Yukon Training Area.

4.4.2 Yukon Training Area Facilities

4.4.2.1 Range Facilities

The Yukon Training Area has one demolition range that is similar to an impact area. 26 mortar and

artillery firing points use(YTA) is located north of Eielson Air Force Base between the Chena and Salcha Rivers. There are 19 training areas and approximately 25,808 acres of impact area totaling 268,911acres suitable for large-scale exercises. 2,995 acres of the total training area are part of the Air Force Tactical Application Center (AFTAC) maintained in exclusive use.
Training Facilities in the YTA include: Lower Winter Camp, Range Operations Center, Bravo Battery, Camera sites I and II, Charlie Battery, Charlie FOB, Digital Multipurpose Training Range (DMPTR), Firebird FLS, Firebird UAS hangar, 26 Firing Points, CALFX Range, Husky DZ, Husky FOB, six DZ/LZ's, Infantry Platoon Battle Course (IPBC), Infantry Squad Battle Course (ISBC), Grizzly Battle Course, various Observation Points, R2205, McMahon Trench, Stuart Creek IA, Skyline FARP, and Manchu Range. Additionally, a road maintenance facility is located near Bravo Battery.

4.4.2.2 Transportation System

Access to the Yukon Training area is from Johnson Road off of the Richardson Highway or from Eielson Air Force Base. Roads are generally lacking with only approximately 1 mile of road per 3,201 acres of training land (84 miles total). A rail line does cross the training area but does not provide access to any range facilities. Air access is available for C130 aircraft at the Firebird FLS and for rotary wing aircraft at multiple landing zones. There is also river access from the Chena River through a recreation area to the North of the Training Area maintained by Eielson Air Force Base.

4.4.3 Physical Resources

4.4.3.1 Topography

Yukon Training Area lies within the Yukon-Tanana Uplands, consisting of rounded, even-topped ridges with gentle side slopes, broad divides, flat-topped spurs, and gently sloping plains. Ridges occupy nearly 10 percent of the area, oriented in a northeast-southwest direction (Bonito 1980). Elevations range from 192 to 3,285 feet.

4.4.3.2 Geology

Bedrock of the Yukon-Tanana Uplands, including most of Yukon Training Area, is characterized by a complex assemblage of Precambrian and Paleozoic-age metamorphic rocks of the Yukon-Tanana crystalline complex (formerly known as the Birch Creek schist). These rocks were later intruded by Cretaceous and Tertiary-age igneous rocks, resulting in a few exposed areas of granite and quartz diorite. Silty micaceous loess, derived from outwash plains south of the Tanana River, was deposited over most of the area during the Pleistocene and Holocene. Some areas are covered by Quaternary deposits, with the most recent deposits occurring along stream valleys in the form of well-stratified gravel, sand, and silt (Bureau of Land Management and U.S. Army 1994).

4.4.3.2.1 Seismicity

Yukon Training Area is in the Salcha seismic zone, a distinct northeast-trending band of epicenters about 50 kilometers long (Page et al. 1991, Alaska Earthquake Information Center and U.S. Geological Survey 1997). Although the epicenters form a conspicuous pattern, no associated fault movement has been identified (Page et al. 1991). The Salcha earthquake of 1937 was one of the largest ever recorded in the Interior, with a magnitude of 7.3. Its epicenter was less than 10 miles from the southwest corner of the Yukon Training Area. In 1996, an earthquake with a magnitude of 4.2 occurred on the Yukon Training Area east of Eielson Air Force Base (U.S. Geological Survey National Earthquake Information Center 1998; Alaska Earthquake Information Center 1998). Many smaller earthquakes are routinely detected.

4.4.3.2.2 Petroleum and Minerals

Mineral resources management on Yukon Training Area is the responsibility of the Bureau of Land Management. Yukon Training Area is exempt from provisions of the Mining Law of 1872, the Mineral Leasing Act of 1920 as amended, the Mineral Leasing Act for Acquired Lands of 1947, and the Geothermal Steam Act of 1970. The withdrawal is closed to all forms of mineral material disposal, both sale and free use, other than that which supports military activity (Bureau of Land Management and U.S. Army 1994).

Measures to safeguard resource values outlined in 43 CFR 3100, 43 CFR 3600, and 43 CFR 3809 apply to mineral development on withdrawn lands. Under terms of the Defense Appropriations Act of 2000, should withdrawn lands be opened to mineral location, mineral patents could convey title to locatable minerals only. These patents would also carry the right to use as much of the surface as necessary for mining under guidelines established by the Secretary of the Interior by regulation (Bureau of Land Management and U.S. Army 1994).

Yukon Training Area has a low potential for oil or gas deposits, and no known potential for coal and oil shale. Yukon Training Area has no potential for concentrations of phosphate, sodium, potassium, or gilsonite, and moderate potential for geothermal resources (Bureau of Land Management and U.S. Army 1994). There has never been significant mining activity on Yukon Training Area, and the area has been closed to mineral exploration since the 1950s. Placer mining has occurred south and east of Yukon Training Area, and portions of Yukon Training Area have a moderate to high potential for gold and tin deposits (Center for Ecological Management of Military Lands 1998). Historic placer mines are reported on Beaver Creek and Pine Creek. Records from the state of Alaska show a claim staked on a tributary of French Creek in the southwestern part of Yukon Training Area. No valid claims exist now.

The *Proposed Yukon Training Area Resources Management Plan Final Environmental Impact Statement* prohibits mining in drop zones and landing fields, and within one mile of all existing roads and major trails, to maintain safe military operations and training. Mineral material sites are an exception to the one-mile off-limits designation. The military may use sand and gravel for its own purposes. Large amounts of sand and gravel are available just west of Yukon Training Area, and there is high potential for localized sand and gravel in some stream valleys on Yukon Training Area (Bureau of Land Management and U.S. Army 1994).

4.4.3.3 Soils

Soils on Yukon Training Area have been mapped at a broad exploratory level of survey. South slopes consist of well-drained silt loams and are generally free of permafrost. Loams grade from shallow, gravelly silt near ridge tops, to silt loams on mid-slopes, to deep, moist silt loams on lower slopes. Drainage bottoms and depressions are occupied by shallow, gravelly silt loam covered with a thick layer of peat and underlain by permafrost. Soils on north-facing slopes are shallow, gravelly silt loams with thick covers and permafrost (Bureau of Land Management and U.S. Army 1994). A partial soil survey was completed in 2000.

4.4.3.4 Water Resources

Northern and northeastern portions of Yukon Training Area are drained by the Chena River and its tributaries: South Fork Chena River, Hunts Creek, and Horner Creek. The southern portion of Yukon Training Area is drained by Ninety-Eight Creek, a tributary of the Salcha River and the Little Salcha River. Streams draining the western portion of Yukon Training Area flow directly, or by way of Piledriver Slough, into the Tanana River. All streams originating on Yukon Training Area have their

headwaters in the Yukon-Tanana Uplands, in rolling glacier-free terrain (Bureau of Land Management and U.S. Army 1994).

Surface water quality on Yukon Training Area is generally good. The Chena River, from the Chena Slough to the confluence with the Tanana River, has been classified by the state of Alaska as Class A (suitable for agriculture, aquaculture, and industrial), Class B (suitable for water recreation), and Class C (suitable for growth and propagation of fish, shellfish, other aquatic life, and wildlife). The pH of the Chena River is slightly above neutral during winter and slightly below neutral in summer. Nitrogen concentration is high in relation to phosphate, which may be the limiting inorganic nutrient for phytoplankton production. Only naturally occurring iron concentrations were higher than the secondary state standards. The high iron concentration in the lower portion of the Chena River may be the result of surface water and groundwater discharge from swampy, muskeg areas in this region. Sediment loads are generally low. Non glacier-fed streams generally carry less than 300 mg/l during high flow and as little as 10 mg/l during low flow periods (Bureau of Land Management and U.S. Army 1994).

4.4.3.5 Climate

Yukon Training Area has the northern continental climate of the Alaskan interior, which is characterized by short, moderate summers, long, cold winters, and little precipitation or humidity. Weather is influenced by mountain ranges on three sides, which form an effective barrier to the flow of warm, moist, maritime air during most of the year. Surrounding uplands also cause settling of cold, Arctic air into Tanana Valley lowlands.

Average monthly temperatures in Yukon Training Area range from –11.5^{o}F in January to 61.5^{o}F in July, with an average annual temperature of 26.3^{o}F. The record low temperature is –66°F, and the record high is 98°F. The average frost-free period is 95-100 days. Prevailing winds are from the southwest in June and July, and from the north and northeast in winter. Average wind velocity is 5.3 miles per hour (mph). The greatest average wind speed is in spring, with a high of 40 mph recorded in Fairbanks. Winds are 5 mph or less 60% of the time. Thunderstorms are infrequent, occurring only during late spring and early summer.

Average annual precipitation is 10.4 inches, most of which falls as rain during summer and early fall. Average monthly precipitation ranges from a low of 0.29 inches in April to a high of 1.86 inches in July. Average annual snowfall is 67 inches, with a record high of 168 inches during the winter of 1970-71. Average annual relative humidity is 55%, with lowest levels during spring and early summer (38% during mid-afternoon in May). Heavy fog is relatively common during December and January, with four or five foggy days each month. Ice fog can be expected any time temperatures drop below -30°F, but is normally restricted to areas near human settlements where moisture is emitted from burning fuels (Bonito 1980).

4.4.4 Biological Resources

4.4.4.1 Flora

Yukon Training Area encompasses a large amount of land with a wide array of physiographic features. Vegetation patterns are influenced by climate, soil, topography (slope, aspect, and elevation), depth to water table, permafrost, and fire.

Yukon Training Area has four vegetation types: moist tundra, treeless bogs, open, low-growing spruce forests, and closed spruce-hardwood forests. The white spruce-paper birch forest of interior Alaska is often called the boreal forest or taiga. Vegetation types of interior Alaska form a mosaic and reflect fire history, slope and aspect, and presence or absence of permafrost (Viereck and Little 1972).

4.4.4.1.1 Vegetative Profile

A typical vegetation profile from lowland, up a south slope, and down the north slope, would include the following; water, barren, high brush, deciduous forest, white spruce forest, moist tundra, black spruce forest, and mixed forest (Bonito 1980). This profile does not precisely match Viereck and Little's (1972) vegetation types, which were mapped on a statewide scale. Wetland occurs at various altitudes and sometimes only during early successional stages. Localized conditions often result in various combinations of vegetation.

A typical vegetation profile from the Chena-Salcha Highlands to the Tanana/Chena River floodplain includes: barren areas (rock and gravel), moist tundra, high brush, forests (needleleaf, deciduous, and mixed), open/woodland forest bogs, riverine tall shrubs, scrub shrub bogs, wetlands, barren, and water (Anonymous 1979; Bonito 1980).

4.4.4.1.2 Floristics Inventory

During 1995-1996, Cold Regions Research Engineering Laboratory conducted a floristic inventory for Fort Wainwright at Yukon Training Area (Tande et al 1996). The inventory focused on vascular plants, so cryptogams (i.e. mosses and lichens) were not identified. The inventory found 491 taxa (including subspecies and varieties), representing 227 genera in 72 families. This is about 26% of Alaska's vascular flora. At least 10 taxa collected represented extensions of known ranges (Tande et al. 1996)..

Plants were collected from 38 plots of the Yukon-Tanana Upland. A total of 1,005 collections were made at 123 sites within Fort Wainwright Army Lands. Center for Environmental Management of Military Lands mounted three sets of collected plants. One set was laminated and remains at Fort Wainwright, and the other two are dry mounted and stored at the University of Alaska Museum, Fairbanks.

From 2001-2011 the Range Training Land Assessment program increased the taxa list to 512 for Yukon-Tanana Upland Region. Also a ground truth survey was conducted in 2008-2010 to provide additional data on common cluster plant community groups(Viereck 1992, Level 5) associated with the land cover types (Viereck 1992, Level 4) their found in, over 1,200 plots were sampled in the Yukon Uplands.

4.4.4.1.3 Threatened or Endangered, and Species of Concern Plants

The Yukon Ecological Management Unit has 4 vascular plant species of concern that are known to occur within the area. These plants are being tracked by the Alaska Natural Heritage Program because they are thought to be uncommon or rare in Alaska and/or uncommon or rare globally (Alaska Natural Heritage Program 2011). These species are listed below in table 4-11 and are documented in the survey results of Tande et al. (1996) and ongoing Range Training Land Assessment survey efforts.

Table 4-11. Yukon Training Area Rare Plant Species.

Species	Common Name	Global Ranking*	Alaska Ranking**
Apocynum androsaemifolium	spreading dogbane	G5	S3
Carex atherodes	wheat sedge	G5	S3S4
Cryptogramma stelleri	fragile rock-brake	G5	S3S4
Lycopus uniflorus	northern bugleweed	G5	S3S4

* Alaska Natural Heritage Program Rare Species Global Rankings G3 Either very rare and local throughout its range or found locally in a restricted range (typically 21-100 occurrences) G4 Apparently secure globally G5 Demonstrably secure globally G#G# Global rank of species uncertain; best described as a range between the two ranks G#T# Global rank of species and global rank of the described variety or subspecies of the species Q Taxonomically questionable ? Inexact
** Alaska Natural Heritage Program Rare Species State Rankings S1 Critically imperiled in state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state (typically 5 or fewer occurrences, or very few remaining individuals or acres) S2 Imperiled in state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (typically 6 to 20 occurrences, or few remaining individuals or acres) S3 Rare or uncommon in the state (typically 21-100 occurrences) S4 Apparently secure in state, with many occurrences S#S# State rank of species uncertain; best described as a range between the two ranks SE possibly introduced

4.4.4.1.4 Ecological Land Classification

An Ecological Land Classification was done for Yukon Training Area lands during 1994, 1995, and 1998. This report included mapping by geomorphology, permafrost, vegetation, ecotypes, ecosubdistricts, and ecodistricts (Jorgenson et al. 1998). The Ecological Land Classification is a hierarchical means to classify land according to various ecological scales. In 2008-2010 a ground truth survey was implemented to provide accurate data for land cover types, over 1,200 points were sampled. The ecological land classification mapping was reedited in 2011 after the initial report to update classification changes, mainly disturbances including urban/training land development and wildfires.

The Yukon Training Area ecological management unit is contained within the Steese - White Mountains ecodistrict, within the Interior Highlands ecoregion. The Yukon Training Area unit is comprised almost entirely of the Chena - Salcha Highlands ecosubdistrict. The Chena - Salcha Highlands is a mountainous area of weathered bedrock in the alpine areas, residual soils on upper slopes, upland loess near the Tanana River, upland retransported deposits, lowland retransported deposits on lower slopes, and headwater streams. The areas are hydrologically linked by surface and groundwater flow. Permafrost is present on northern and lower slopes and absent on southern slopes. White spruce-birch-aspen forests are found on southern slopes, black spruce forests are found on northern slopes, riverine willows are found in drainages, and alpine tundra are commonly located on high exposed ridges. The Yukon Training Area unit is also made up of small regions of Stuart Creek Lowlands and French-Moose Creek Lowlands ecosubdistricts.

4.4.4.1.5 Wetlands

The Yukon Training Area supports palustrine freshwater wetlands. Scrub-shrub and emergent wetlands are abundant on the alluvial plain between the Chena River and foothills of the Yukon-Tanana Uplands, where shallow, gravelly silt loams underlain by permafrost impede soil drainage and promote wetland conditions. On the alluvial plain, scrub-shrub wetlands composed of stunted black spruce are located on north-facing slopes and flat, low-lying areas where soils are too cold and wet to support tree growth. Scrub-shrub wetlands dominated by deciduous species, such as willow and shrub birch, are located in drainage channels, along stream corridors, on terraces, and on slightly elevated areas adjacent to ponds. Emergent wetlands dominated by grasses and sedges are located in seasonally or permanently flooded flat, low-lying areas, such as the margins of ponds and lakes and in sloughs and localized depressions.

In the Yukon-Tanana Uplands, w here the relief promotes well-drained soils, wetlands are generally restricted to north-facing slopes, valley bottoms, and drainages. Forest wetlands and scrub-shrub wetlands composed of black spruce are found on cold, north-facing slopes and valley bottoms. Scrub-shrub

communities composed of shrub birch are located on terraces and valley bottoms, and scrub-shrub wetlands composed of willow and alder form in drainages and that are seasonally flooded.

Three major wetland mapping efforts have been made to identify and classify wetlands and waterbodies in the Yukon Training Area. In 1992, the National Wetlands Inventory (NWI) produced a map of wetlands and waterbodies for approximately 50% of the Yukon Training Area based on the presence of wetland vegetation interpreted from color-infrared photography; these maps are periodically updated by the NWI using current aerial imagery. In 1998, the U.S. Army Engineer Waterways Experiment Station (WES) completed a wetland delineation of the Yukon Training Area that included a review of existing information, wetland identification and characterization, base map, and final report. In 2009, 2010, 2011, and 2012, the Center for Environmental Management of Military Lands (CEMML) produced wetland and waterbody maps based on a review of existing information (e.g., NWI maps, NRCS soil surveys) and field surveys that identify waters of the U.S. as small as 0.1 acre. FWA currently uses CEMML's map for management, planning, and permitting purposes.

4.4.4.1.6 Forest Resources

A forest inventory is an integral part in establishing a plan for managing forest resources. The Yukon Training Area Ecological Management Unit was inventoried by Directorate of Public Works Environmental Forestry Staff during the 2001 and 2002 field seasons. Tree data was collected from permanent plots as part of an on going Forest Inventory and Analysis of USARAK (Fort Wainwright) lands.

Stand Delineation and Inventory

Stand timber types were delineated utilizing aerial photography and satellite imagery to produce maps that demarcate land into forested and non-forested categories. This process was also used to help identify geographical coordinates for the plots and to establish permanent plots on the ground. Timber stands where further defined into types based on specific characteristics such as species composition, size class, and stocking. These stand types are predefined by the Alaska Vegetation Classification system (Viereck, et al. 1992). The Fort Wainwright inventory method further stratifies out stands with higher timber value, greater ecological importance, and greater potential for military training Stand timber typing was confirmed on the ground during stand inventory. The fixed plot radius sampling method was used for tree data collection.

Forest Land Classification and Timber Volume Summary

The Yukon Training Area Ecological Management Unit contains approximately 256,969 acres of forested and non-forested lands (Table 4-12). Forestlands in the project area occupy 93.8% of the land area or 241,136 acres. Non-forestland amounts to 6.2% of the total project land area or 15,832 acres. The forested lands contain 51,846 acres of commercial forestland. Commercial forestlands are those lands containing sawtimber and poletimber size classes.

The total volume found in the various types or strata on Yukon Training Area is found in table PC-3. The estimated total volume of timber in this area is 25,969,249 cubic feet of commercial timber. There is 25,402,640 board feet (Scribner) and over 545,198 tons of green biomass. Also provided is potential commercial forests acreage, identified as Timberland, where Yukon Training Area has 185,449 and of that acreage 92% is accessible (Accessible meaning not within restricted access or impact areas)

Table 4-12. Yukon Training Area Forest Land Classification and Timber Stand Summary

Forest Category	Total Acreage	Commercial Forest Category	Land Acreage	Percent Total Acres

Forested Lands	241,136	Commercial Forest	51,846 (50,314)*	20.2% (97%)**
		Non-Commercial Forest	189,291	73.7%
Non-Forested Lands	15,832	Shrub/Scrubland	8,729	3.4%
		Herbaceous	1,632	0.6%
		Barren-Natural/Cultural	2,837	1.1%
		WaterBodies	338	0.1%
Total Cubic Feet	**25,969,249 (25,033,038)***	**Total Acres**	**256,969 (226,822)***	**100.0% (88.3%)****
Total Board Feet	**25,402,640 (24,611,514)***	**Total Timberland Acres**	**185,449**	**72.2%**
Total Green Tons	**545,198 (525,234)***	**Accessible Timberland Acres**	**170,681**	**66.4% (92%)****

***Indicates acreage/volumes that is accessible.**
**** Percentages are deferred from accessible acreages of corresponding rows.**

Estimated Annual Harvest
An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total existing commercial forest area by the rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The following softwood, hardwood, and mixed softwood/hardwood accessible harvest acreage represent saw, pole, and pole/saw timber types; the majority is in the pole/saw type.

Table 4-13. Yukon Training Area Estimated Accessible Annual Harvest.

Harvest Timber Type	Potential Harvest Land	Rotation Age	Regeneration Time	Total Rotation Length	Estimated Annual Harvest
Softwoods	1,640 acres	110 years	10 years	120 years	14 acres
Hardwoods	28,547 acres	70 years	10 years	80 years	356 acres
Softwood/Hardwoods	20,420	110 years	10 years	120 years	170 acres

4.4.4.2 Fauna

Most vertebrate species indigenous to central Alaska can be found on Yukon Training Area. Game species found on Yukon Training Area are managed by Alaska Department of Fish and Game. Alaska Department of Fish and Game monitors these species to determine population status, reproductive success, harvest and home ranges. Alaska Department of Fish and Game also sets bag limits and seasons for these species. Fort Wainwright will cooperate with and contribute funds to help Alaska Department of Fish and Game monitor or study game species on an annual basis to ensure sustainable harvests, based on fund availability.

Black and grizzly bears are found throughout Yukon Training Area. Both are hunted, although black bears are taken more often due to their densities. Hechtel (1991) found that bear harvest was sustainable and appeared to be directly linked to access with a mean harvest of 9.8 bears/year from Yukon Training Area (Hechtel 1991). Areas in Yukon Training Area may have localized over harvest (Hechtel 1991). No

serious black bear conservation problems were identified related to Yukon Training Area land management.

Since 1974 (when harvested black bears were first required to be sealed), black bear harvest on Yukon Training Area has varied from one (1979) to 15 (1977). Black bear harvest on Yukon Training Area occurs mostly during spring (Hechtel 1991). Since 1974, the bag limit has been three bears annually with no closed season. Bear baiting was closed from 1977 through the 1982-83 season due to conflicts with pipeline construction activity. Since the 1983-84 season the practice has been legal. Baiters must have permits. Harvest across Game Management Unit 20 has generally been higher since re-opening of baiting, but the difference is not statistically significant (Hechtel 1991). Grizzly bears are hunted during all but summer months. The bag limit is one bear every four regulatory years. Grizzly bears may not be taken over bait. Only a few grizzly bears (0-3 annually during the past five years) are harvested from Yukon Training Area. From 1997 to 2012, black bears harvested from spring baiting methods averaged 2.8 bears/year.

Yukon Training Area is part of GMU 20B, more specifically the eastern Unit 20B. Although there is no information on moose specific to the Yukon Training Area, ADF&G routinely conducts aerial surveys in this area, as part of the state's management plan, and reports suggest healthy moose densities (Young 2010. This training area contains more suitable winter habitat for the 20A Tanana Flats Training Area moose population.

Yukon Training Area is part of the historic range of the Fortymile caribou herd. During the early 1900s, this herd was the largest in Alaska and one of the largest in the world, ranging over 85,000 square miles. In 1920, the herd was estimated at 568,000, but herd size fell to 10,000-20,000 in the 1930s. The herd grew to perhaps 60,000 in 1956, but it decreased to about 6,500 by 1973. This crash was probably due to over harvesting, unfavorable weather, and wolf predation. By 1990, the herd had increased to about 22,000 caribou, and has remained stable until 1995. In 1995 the herd began to increase and by 2000, the herd was estimated at 35,500. A photocensus of the Fortymile caribou herd was conducted in 2007 with 38, 364 animals counted (Gross 2009).

Rarely are caribou now found in the Yukon Training Area. However, the degree which caribou seasonally migrate through is unknown. No caribou have been taken from Yukon Training Area in recent years (Gross 2005).

Small mammals play important ecological roles as secondary consumers and as prey for a variety of predators. The Alaska tiny shrew (*Sorex yukonicus*) is newly described and apparently rare, found in small numbers in widely separated parts of Alaska. Other small mammals that are potentially rare inhabitants of Yukon Training Area include the long-tailed vole (*Microtus longicaudus)*, northern bog lemming (*Synaptomys borealis*), brown lemming *(Lemmus trimucronatus)*, and water shrew (*Sorex palustris)*.

The American peregrine falcon was recently de-listed from endangered species status. Though not known to nest on Yukon Training Area, it is an infrequent migrant. The Salcha Bluff area in the Yukon Training Area includes habitat able to support feeding and nesting opportunities for peregrine falcons (Ritchie and Rose 1998). Although this raptor has been recently delisted, the U.S. Fish and Wildlife Service requests that Fort Wainwright continue consultation on any projects taking place in the Yukon Training Area that may hinder their recovery.

The bald eagle, a federally listed threatened species in the lower 48, is locally common in the Yukon Training Area. Bald eagles nest in the Granite Tors in the State Recreation Area just north of Yukon

Training Area, and along the Salcha and Tanana Rivers (Anderson et al. 2000)The golden eagle is a resident of forest and alpine habitats of the installation (Nakata Planning Group 1987).

A survey of cliff and tree nesting raptors in the Yukon Training Area was conducted in 1998 by ABR, INC. (Anderson et al. 2000). Five potential cliff sites were found in the Yukon Training Area, but the habitat value for these sites was judged poor to fair. The small number and size of streams in the Yukon Training Area limits the potential for tree nesting bald eagles.

Seven birds are listed as state-sensitive (USARAK and Center for Ecological Management of Military Lands 1999), the gray-cheeked thrush, blackpoll warbler, American peregrine falcon, golden eagle, olive-sided flycatcher, Arctic peregrine falcon, and Townsend's warbler. The gray-cheeked thrush was commonly noted in recent surveys (Bureau of Land Management and U.S. Army 1994). All but the Arctic peregrine falcon have been confirmed on Fort Wainwright (USARAK and the Center for Ecological Management of Military Lands 1999).

The Chena and Salcha rivers are important spawning areas for chum salmon, arctic grayling and king salmon. All of these species inhabit the Tanana River seasonally.

The wood frog (*Rana sylvestris*) is the only amphibian residing in the interior of Alaska. There are no reptiles. Declines in amphibian populations are being recorded worldwide and in Alaska. Deformities in frogs are becoming more manifest, and reasons for the deformities are still unclear. In addition to morphological deformities, amphibians worldwide are affected by a fungus (*Batrachochytrium dendrobatidis)* that causes chytridiomycosis. This infectious disease inhibits absorbtion of water through the skin, resulting in deadly electrolyte imbalances. Scant information is available on wood frog densities in interior Alaska.

No federally listed threatened or endangered animals reside on Yukon Training Area. The U.S. Fish and Wildlife Service, Office of Migratory Bird Management maintains a list of *Migratory Birds of Management Concer.*Alaskan species of management concern occurring on Yukon Training Area include the trumpeter swan, common loon (*Gavia immer*), northern harrier (*Circus cyaneus*), northern goshawk (*Accipiter gentilis*), olive-sided flycatcher, alder flycatcher (*Empidonax alnorum*), gray-cheeked thrush, and blackpoll warbler.

Nineteen bird species found on Yukon Training Area are exhibiting continent wide population declines, and have been delineated as target or priority species for monitoring by the Boreal Partners in Flight Working Group. There are no legal requirements to manage these species although all migratory bird species are afforded some protection under the Migratory Bird Treaty Act.

There are seventeen species on the Fort Wainwright Ecosystem Management Priority List. These are olive-sided flycatcher, lesser yellowlegs, Wilson's snipe, rusty blackbird, upland sandpiper, solitary sandpiper, varied thrush, little brown bat, blackpoll warbler, Wilson's warbler, greater scaup, lesser scaup, northern waterthrush, Townsend's warbler, western wood peewee, great gray owl, and white-winged crossbill.

4.4.5 Cultural Resources

Less than five percent of Yukon Training Area has been surveyed for archeological sites, and twenty sites have been identified (nineteen prehistoric and one historic sites).

The White Mountains and Tanana Hills of the Yukon Training Area were used likely used sporadically during the past several thousand years for hunting, but likely not for year-round settlements. Most of the sites are very small scatters of stone tool making debris indicating brief occupations.

4.4.6 Yukon Training Area Management Prescriptions

4.4.6.1 Prescriptions and Policy

Yukon Training Area is composed of Training Areas 301-318, the Multi-Purpose Training Range, Air Force Technical Application Center and Stuart Creek Impact Area. The west portion of Yukon Training Area is managed together as an ecosystem management sub-unit (Training Areas 1, 2, 3, and 4), while the eastern portion (training Areas 5, 6, 7 and 8) is managed as a separate sub-unit. The Multi-Purpose Training Range includes Manchu Range, the Multi-Purpose Training Range, the Infantry Squad Battle Course and the Infantry Platoon Battle Course. The Air Force Technical Application Center is managed as a sub-unit as is the Stuart Creek Impact Area.

4.4.6.2 Military Use

Training areas XXX in the YTA 301-310 are suitable for small arms, platoon to brigade-sized exercises, company-sized live-fire exercises, road marches, and bivouacs. These areas are primarily used for large-scale training exercises, airborne drops, and winter bivouacs. The recommended time for military activities involving off road mechanized vehicle maneuver is between freeze-up and spring break-up. Air-mobile and air-drop operations may be conducted at the Husky Drop Zone year round. Permission must be obtained from the Air Force to use the Chena Annex at the northern end of Transmitter Road.

Training areas XXX in the YTA 311-118 are suitable for indirect fire weapons, platoon to brigade-sized exercises, road marches, and bivouacs. It is also used for large-scale exercises, year-round bivouac, land navigation, and maneuver using Small Unit Support vehicles. The recommended time for military activities involving off road mechanized vehicle maneuver in valley areas is between freeze-up and spring break-up. Other military activities can be conducted year-round. There are no areas off-limits to training.

The Stuart Creek Impact Area is suitable for direct and indirect fire artillery, bombing and potential high hazard dud producing munitions. The Multi-Purpose Training Range is suitable for direct fire small arms and training munitions.

4.4.6.3 Natural Resources Management

The east portion of Yukon Training Area (Training Areas 1, 2, 3, and 4) are managed as "*full*" natural resource management areas. Full management areas are sub-units that receive use and are accessible by road. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted. Fire suppression category for these areas is "*full*". These areas receive maximum detection coverage and receive immediate and aggressive initial attack responses. For most of these areas the vegetation is managed by the Bureau of Land Management. The Army retains vegetation rights for Bravo and Charlie Batteries. These areas are open for hunting, trapping and fishing. Recreation use category is "*Open*". Ecosystem management prescriptions are shown in Table 4-18.

Table 4-14. Yukon Training Area Ecosystem Management Prescriptions.

Ecosystem Management Sub-unit	Natural Resource Management	Fire Suppression Category	Vegetation Management	Hunting and Trapping	Fishing	Recreational Use Management

	Priorities					
Training Areas 301-310	Full	Full*	BLM**	Open	Open	Open
Training Areas 311-318	Modified	Limited*	BLM	Open	Open	Open
Manchu Range Complex	Full	Full	BLM	Closed	Closed	Closed
AFTAC	Limited	Full	BLM	Closed	Closed	Closed***
Stuart Creek Impact Area	Limited	Limited	BLM	Closed	Closed	Closed

*Fire suppression category is modified in southern portions of TA 4 and 5.
**Vegetation rights for Bravo and Charlie batteries are controlled by the Army.
***Beaver Creek Road in AFTAC is open for through transit to get to other recreation areas.

The western portion of Yukon Training Area (Training Areas 5, 6, 7, and 8) is managed as "*modified*". Modified management areas are sub-units that receive use, are not accessible by road (only small portions of western Yukon Training Area are accessible by road), but are open to public access. All forms of surveys, monitoring, and active management of land, forest, fish and wildlife, and recreation resources may be conducted, but may not be practical. Fire suppression category is "*limited*" although some areas in the southern portion of Training Area 5 are "*modified*". The "*limited*" option recognizes areas where natural fire is important or the values at risk do not warrant the expense of suppression. Limited management areas receive routine detection effort. Attack response is based on needs to keep the fire within Limited management areas and to protect individual Critical management sites within Limited management areas. The "*Modified*" option provides a relatively high degree of protection during periods of increased fire danger, but a lower level of protection when risks of fires are diminished. Modified areas receive maximum detection coverage.

The Manchu Range Complex includes the area surrounding Manchu Road north of Quarry Road. This area receives "*full*" natural resource management priority and "*full*" fire protection status. BLM retains vegetation management rights for this area. This area is "*closed*" to hunting, trapping, fishing and recreational use. The Air Force Technical Application Center and Stuart Creek Impact Area receive "*limited*" natural resource management priority. Fire protection option for the Air Force Technical Application Center is "*full*", while Stuart Creek Impact Area is "*limited*". There is no hunting, trapping, fishing or off-road recreational vehicle use authorized at any time in either area, except transit through the Air Force Technical Applications Center on Beaver Creek Road.

Yukon Training Area is not an approved federal or state subsistence area. Yukon Training Area is a traditional subsistence area for upper Tanana tribes. There is no subsistence preference for any subsistence user but any subsistence user may conduct approved subsistence activities after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and Executive Orders pertaining to natural resources management on Yukon Training Area. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of National Environmental Policy Act, Geographic

Information System, and other decision support systems, and integration with other land management programs such as Sustainable Range Program and Sustainment, Restoration and Modernization Program.

4.4.6.4 Access

The Yukon Training Area ecological management unit is land withdrawn from public domain for military use. The public has access to the area for recreational and subsistence purposes. Access to the area can be restricted when non-participants may be endangered by military activities. Once the public has been notified by the local news media, selected main roads leading to the area requested for the exercise will be closed. Temporary road barricades (sawhorses, concertina wire, etc.) supplied by the using unit will be placed at appropriate points along the road network to warn approaching non-participants. Road barriers will be manned by participating units with knowledge of dates and times of the road closure. Once training plans have been finalized, presented to Range Control, and notice given to the public, changes are not accepted.

4.4.6.5 Outdoor Recreation

Yukon Training Area is open to all off-road recreational vehicles. Vehicles over 1500 lbs GVWR must stay on improved roads. These roads include Johnson, Skyline, Quarry, Manchu, Transmitter, and Brigadier. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs or less unless there is a potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. The same restrictions apply to off-road recreational vehicles 1500 lbs GVWR or less if there is potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited.

There is no recreational activity of any type permitted in the Stuart Creek Impact Area, Air Force Technical Applications Center (except for by-passing through on the Beaver Creek Trail) and French Creek Small Arms Impact Area, within 100 meters of any structure and those other permanently closed/off-limit areas.

Western Yukon Training Area is "*open*" for hunting, trapping, fishing and off road recreational vehicles. Recreational use areas on Yukon Training Area are shown in Figure 4-6.

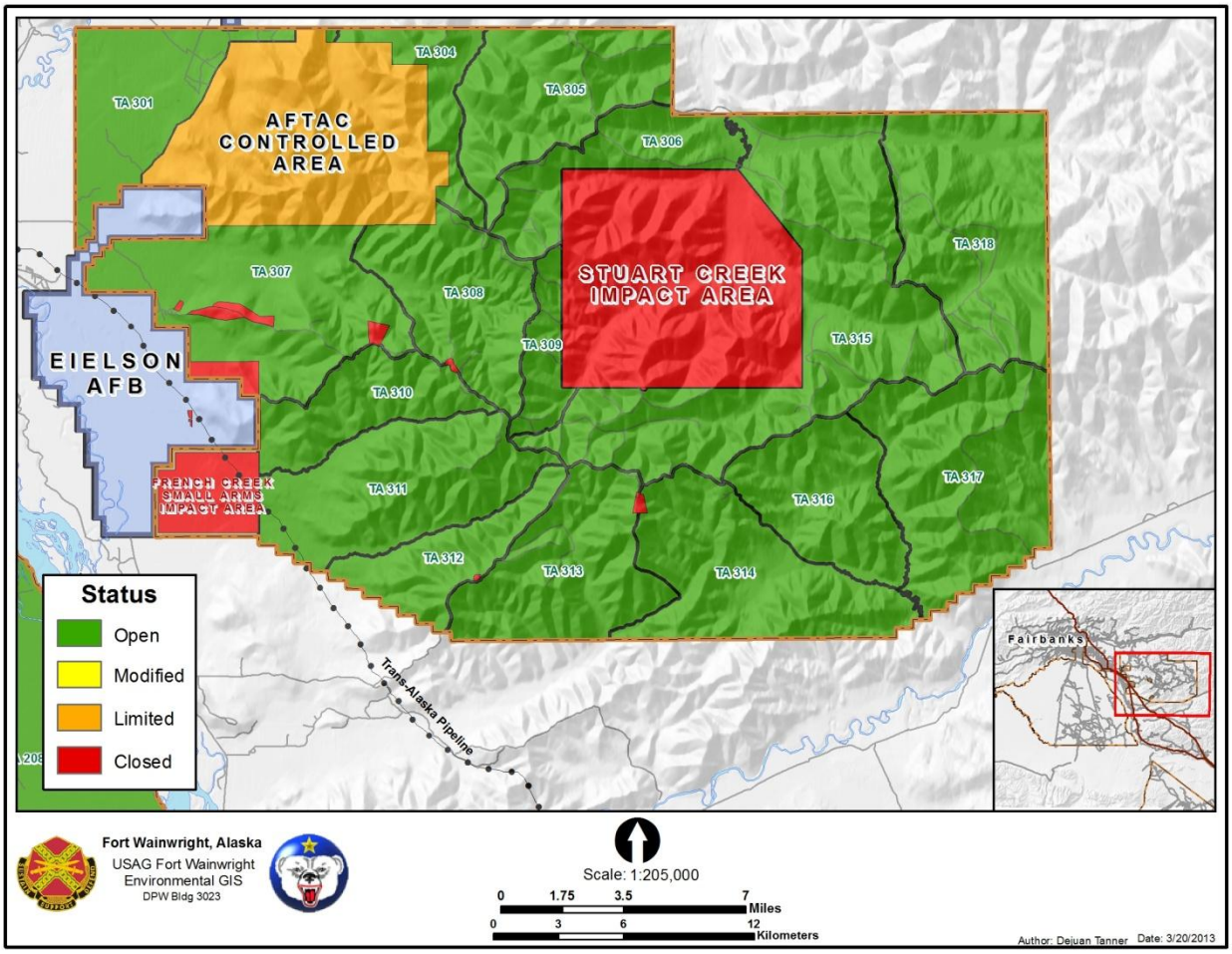


Figure 4-6. Yukon Training Area Recreation Use Areas.

4.4.7 Yukon Training Area Projects

Example ecosystem management projects for Yukon Training Area are shown below in Table AC-3.

4.5 Donnelly Training Area Ecological Management Unit

4.5.1 Location

Donnelly Training Area is located 107 road miles southeast of Fairbanks and six road miles south of the junction of the Alaska and Richardson highways. The training area lies within the central valley and hill area, bordered by the Yukon Tanana Uplands to the north and the Alaska Range to the south (United States Army Alaska 1995a). The entire region lies within the Tanana River Valley. Donnelly Training Area is shown in Figure 4-7.

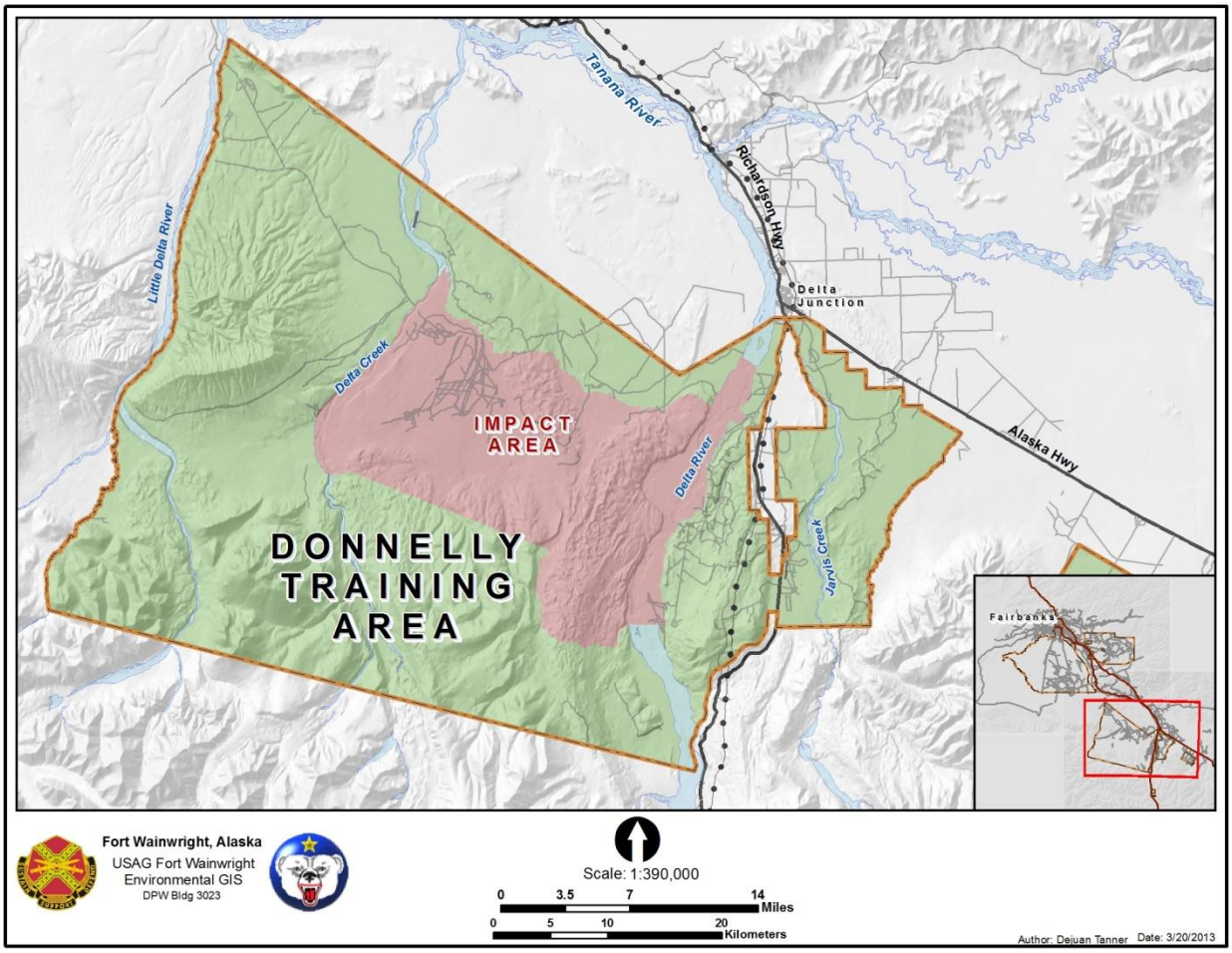


Figure 4-7. Donnelly Training Area.

Donnelly Training Area is a sub-training area of Fort Wainwright. Donnelly Training Area consists of two large training areas, Donnelly Training Area West (approximately 531,000 acres) and Donnelly Training Area East (approximately 93,000 acres). The Donnelly Training Area West lies between the east bank of the Delta River and east bank of the Little Delta River. Northern and southern boundaries are two northwest-southeast diagonal lines varying from a little over twenty miles apart in the east to about thirty-five miles apart in the west. The Delta River flows northward along the eastern boundary of the Donnelly Training Area West. The Donnelly Training Area East is located from the eastern bank of the Delta River to Granite Creek on the west. The northern boundary roughly parallels the Alaska Highway, and the southern boundary is in the foothills of the Alaska Range, on a line between Granite Mountain and Donnelly Dome.

Donnelly Training Area is separated from Delta Junction by Jarvis Creek. Delta Junction is the largest community in the area, with 958 residents in 2010 (compared to 703 in 1970) (U.S. Census Bureau 2010). Other developed areas include Big Delta to the north and the Clearwater farming and ranching area to the east. The area surrounding Delta Junction, known as Deltana, showed a population of 2,251 in 2010. The Alaska and Richardson highways and the Trans-Alaska Pipeline cross Fort Greely and Donnelly Training Area. The pipeline generally parallels the Richardson Highway, with above and below ground sections located within the Donnelly East Training Area.

Neighboring Tribes include the Healy Lake Traditional Council, Dot Lake Village Council, and the Tanacross Village Council. These represent the nearest federally recognized Indian Tribes that have ties to the Fort Greely and Donnelly Training Area-associated lands. Other Upper Tanana Tribes are also affiliated with the area through familial relationships (Jim Simon personal communication 2001).

Donnelly Training Area comprises approximately 660,000 acres. Most of the Donnelly Training Area land is withdrawn from public use by stipulations that vary with each withdrawal document. Some stipulations are consistent throughout all withdrawals and Executive Orders. Withdrawn lands are not available for disposal, including state or native selection, sales under Federal Land Policy and Management Act or the Recreation and Public Purposes Act, or exchanges. In addition, no rights-of-way are allowed on withdrawn lands that are closed for public access. However, there is a process identified to determine the validity of rights-of-way claims for administrative purposes only.

In 1950, the Army obtained a Special Land Use permit from the Department of the Interior for use of 572,000 acres known then as the West Training Area. The permit was granted in six-month extensions until passage of legislation in 1961 granted withdrawal for a ten-year term. The withdrawal was renewed in 1971 for five years, excluding a five-acre trade and manufacturing site near the western edge of the West Training Area. In 1976, the West Training Area was segregated from public use pending renewal of the existing withdrawal legislation by Congress. Congress renewed the withdrawal in 1986 for a fifteen-year term with the passage of the Military Lands Withdrawal Act (Public Law 99-606). These lands were withdrawn again in 2001 for a period of 25 years for military use by Public Law 106-65. With the finalization of BRAC, the boundary has shifted to the east bank of the Delta River, making it about 531,000 acres, and the name is now the Donnelly West Training Area.

The Army obtained permanent use of a 160-acre tract called the East Training Area by a Public Land Order. In late 1958, the Army obtained the use of 51,750 acres of the East Training Area by a permit from the Department of the Interior (including the 160 acre tract). The permit was granted six-month extensions until passage of Congressional legislation. The legislation passed in 1961, granting the Army use of 51,590 acres of the East Training Area for a ten-year term. That legislation excluded the 160-acre tract, which was returned to the Bureau of Land Management. The withdrawal was renewed in 1971 for five years. In 1976, the East Training Area was segregated from public use pending renewal of the existing withdrawal by Congress. Congress renewed the withdrawal in 1986 for a fifteen-year term with the passage of the Military Lands Withdrawal Act (Public Law 99-606). These lands were withdrawn again in 2001 for a period of 25 years for military use by Public Law 106-65. Due to final BRAC actions, the name has changed to Donnelly East Training Area, and the west boundary has shifted to the Delta River, enlarging it to approximately 93,000 acres.

4.5.2 Donnelly Training Area Facilities

4.5.2.1 Ranges

Donnelly Training Area includes approximately 501,022 acres of maneuver land and 147,463 acres of impact areas. Donnelly Training Area has 31 training areas east of the Delta River, and 16 large training areas west of the Delta River. Training facilities at DTA include the Wills Small Arms Complex with 6 firing ranges, Lampkin Range, the Collective Training Range, Bondsteel and Simpsonville CALFEXs, the Battle Area Complex and Combined Arms Collective Training Range, Texas Range, Washington Range, the Twin Lakes UAS Facility, the Interim Staging Base, 6 Firing Points and 18 Observation Points.

Other significant training facilities include eight drop zones and two combat assault strips that support airborne and air-land operations. Donnelly Drop Zone can support a battalion-sized airborne operation. Six of these drop zones are located in the Donnelly East Training Area and two are located in the Donnelly West Training Area. All are used primarily as non-firing maneuver areas. Cold Regions Test Center utilizes Donnelly Training Area for experimental airdrops, airborne training, and testing of clothing, vehicles, and equipment. The Cold Regions Test Center conducts natural environment cold weather testing at various ranges and facilities on Donnelly Training Area. In addition, they have specialized testing facilities at the Bolio Test Complex, Texas Condo, Texas Test Complex, Washington Range, Mississippi Test Complex, and the Mobility Test Complex..

4.5.2.2 Transportation Systems

The Richardson and Alaska highways serve Fort Greely and Donnelly Training Area and the Delta Junction area. Both are maintained year-round. The Richardson Highway is a two-lane primary road that connects the port of Valdez to the south, with Fairbanks to the north. It intersects the Glenn Highway at Glenallen, providing a direct link with Anchorage. Thus, the Richardson Highway links Donnelly Training Area to both Fort Richardson and Fort Wainwright, and it links with the Alaska Highway, connecting Alaska with the Canadian road system.

There is no rail service to Donnelly Training Area, nor are there navigable waterways for waterborne transportation. The nearest rail service is at Eielson Air Force Base, about 70 miles north. The Alaska Railroad has proposed a rail line from Fairbanks to Delta Junction and has started construction of a bridge across the Tanana river. Estimated completion date of this project is unknown at this time. The Alaska Railroad provides year-round passenger, freight, and vehicle service between Anchorage and Fairbanks. Most northbound freight arrives by sea at either the port of Anchorage or the port of Whittier for transfer to the railroad. The Alaska Railroad provides a connection to Seward, 80 miles to the south of Anchorage, the nearest port with intermodal capability.

Allen Army Airfield at Fort Greely consists of three active runways, a hangar, aircraft parking, and airfield support facilities. The airfield can support C5, C17, C130, and C141 aircraft in the winter, but during summer months there is a 250-ton weight limit. In addition, there is a small, unpaved light aircraft landing strip north of Delta Junction.

Donnelly Training Area East contains a vehicle test track and 33-Mile Loop which can be used to test wheeled and tracked vehicles under extreme temperature conditions and varying snow depths. There is also a good network of roads and trails between the Delta River and the Richardson Highway. Donnelly Training Area West is only accessible to ground vehicles when the Delta River is frozen and the minimal network of winter trails are frozen and groomed.

4.5.3 Physical Resources

4.5.3.1 Topography

Donnelly Training Area lies north of the Alaska Range, in the Tanana River watershed. The area has a number of features associated with past and present glacial activities, including terminal moraines, outwash fans, braided streams, kettle lakes, and loess deposits. The Donnelly East Training Area and the northern half of the Donnelly West Training Area lie within the Tanana-Kuskokwim lowland. The entire lowland area is a structural basin. It subsided as the Alaska Range rose to the south and then filled with materials eroded from those mountains. The area consists of alluvial fans that slope northward from the mountains and drop 20 to 50 feet in elevation per mile until they reach the floodplain along the Tanana River. The terrain consists of generally flat lowlands, ranging from 1,200 to 1,600 feet above sea level.

The southern half of the Donnelly West Training Area primarily lies within the northern foothills of the Alaska Range. The area is characterized by flat-topped ridges that are oriented west to east and range from 2,000 to 4,500 feet in elevation. Ridges are three to seven miles wide and five to twenty miles long, and are separated by rolling lowlands ranging from 700 to 1,500 feet in elevation, and spans two to ten miles in width. The foothills are largely unglaciated, although glaciers from the Alaska Range widened valleys. In the southwestern portion of the Donnelly West Training Area, elevations range from 4,000 to 6,200 feet, and some valley glaciers extend onto the installation (USARAK 1979).

4.5.3.2 Geology

Climatic fluctuations during the Quaternary Period caused glacial expansion and recession (Racine and Walters 1991). While central Alaska was not glaciated, glaciers during glacial advances surrounded the area. Rivers flowing from glaciers deposited several hundred feet of silt, sand and gravel in the Tanana and Yukon valleys. Most northern portions of Donnelly Training Area are composed of these Quaternary deposits. A complex assemblage of Precambrian and Paleozoic-aged metamorphic rocks of the Yukon-Tanana crystalline complex (formerly known as Birch Creek schist) characterizes bedrock of the northern foothills. These rocks were later intruded by Cretaceous and Tertiary-aged igneous rocks, resulting in a few exposed areas of granite and quartz diorite (USARAK 1979).

4.5.3.2.1 Seismicity

Even though seismic activity in Alaska exceeds that found in any other state, few shocks have caused severe damage because of the absence of large population centers. Donnelly Training Area lies in a 200-mile wide seismic zone that extends from Fairbanks southward through Prince William Sound. Since the 1960s, several minor seismic events occurred on the Donnelly East and West Training Areas. Although this is not a sufficient time span to assess seismic hazard, there is no record of damage sustained from these events. The Denali Fault extends through the Alaska Range just south of the installation, and slip on this fault is on the order of 1 cm per year (Matmon et al. 2004).

4.5.3.2.2 Petroleum and Minerals

Petroleum and mineral rights management on withdrawn lands is the responsibility of the Bureau of Land Management. Many glacial deposits in the area are good sources of sand and gravel for aggregate or base course materials. They were used for construction of the Richardson and Alaska highways and the Trans Alaska Pipeline. In 1942, a gold and molybdenum deposit was found along Ptarmigan Creek in the southwestern portion of the West Training Area. Ore was mined from this deposit, but it was never shipped. Other deposits of gold, lead and tin have been reported from areas surrounding the post (Bureau of Land Management and U.S. Army 1994). Portions of the withdrawn lands have moderate to high potential for placer gold deposits. Localized placer deposits may also occur in streams draining the Granite Mountains and Tertiary-age gravel benches (Center for Ecological Management of Military Lands 1998).

The Jarvis Creek coalfield is located southeast of Donnelly East Training Area. Coal resources in that area are estimated to be 76 million tons; two-thirds of which occur at depths of less than 1,000 feet. A few

hundred tons of coal were extracted from one small mine in the Jarvis Creek field in 1958. The mine provided all the coal requirements at Fort Wainwright and Eielson Air Force Base for at least one year and was active from 1966 to 1972 (USARAK 1979).

Four areas of Donnelly Training Area are described in the *Fort Greely Resources Management Plan/Final Environmental Impact Statement* (Bureau of Land Management and U.S. Army 1994b) as having mineral potentials. They include: (1) the Middle Tanana Basin, which occupies the northern and northeastern strip of the installation and encompasses approximately 30% of the post; (2) the Nenana Coal Basin, which lies in the southern and southwestern portions and encompasses about 40% of Fort Greely and Donnelly Training Area; (3) a non basin area occupies a strip between the Middle Tanana Basin and the Nenana Coal Basin, about 20% of the post; and (4) igneous/metamorphic rock outcrops occupy two areas in the southwestern corner of the post (Bureau of Land Management and U.S. Army 1994b). Coalfields are scattered throughout the Nenana Coal Basin, and it has a high potential for producing coal. Whereas the central non-basin area has low potential, the northern Middle Tanana Basin has moderate potential, and the outcrops have no potential (Bureau of Land Management and U.S. Army 1994b). The potential of finding economic deposits of Tertiary coal on Fort Greely and Donnelly Training Area is unknown due to poor outcrops, a lack of subsurface information, the extensive erosion of Tertiary sediments, and structural deformation of the bedrock (Center for Ecological Management of Military Lands 1998).

Coal and organics within the Tertiary sediments could generate and trap gas under suitable geologic conditions. The Nenana Basin, with its known coal deposits, has moderate potential for producing gas (Center for Ecological Management of Military Lands 1998). Granitic plutons occur near the eastern and western borders of Donnelly Training Area. Elsewhere in Alaska, these features are associated with thermal springs. Donnelly Training area is classified as having moderate potential for geothermal resources (Bureau of Land Management and U.S. Army 1994b). The rock outcrops have no potential for phosphate, sodium, potassium, or gilsonite, while other areas have low potential for these minerals.

The Fort Greely Resources Management Plan (Bureau of Land Management and U.S. Army 1994b) prohibits mining in drop zones and landing fields, and within one mile of existing roads and major trails to maintain safe military operations and training. Mineral material sites are an exception to the one-mile off-limits designation. The military may mine sand and gravel for its own purposes.

Measures to safeguard resource values outlined in 43 CFR 3100, 43 CFR 3600, and 43 CFR 3809 apply to mineral development on withdrawn lands. Under terms of the Defense Appropriations Act of 2000, should withdrawn lands be opened to mineral location, mineral patents could convey title to locatable minerals only. These patents would carry the right to use as much of the surface as necessary for mining under guidelines established by the Secretary of the Interior by regulation (Bureau of Land Management and U.S. Army 1994b).

The Fort Greely Resource Management Plan (Bureau of Land Management and U.S. Army 1994b) continues the exemption of withdrawn lands from provisions of the 1872 Mining Law, the 1920 Mineral Leasing Act (as amended), the 1947 Mineral Leasing Act for Acquired Lands, and the 1970 Geothermal Steam Act. Withdrawn lands are closed to all forms of mineral material disposal, both sale and free use, other than to support military activities.

4.5.3.3 Soils

The soils on Donnelly Training Area have been mapped in detail. The cantonment area and surrounding land east of the Delta River have been mapped at a scale of 1:25,000. The area west of the Delta River have been mapped at a scale of 1:63,000. In general, soils are derived from glacial actions and modified

by streams and discontinuous permafrost. The Natural Resources Conservation Service (formerly the Soil Conservation Service) identified 12 soil associations in the area of Donnelly Training Area. Soils in the northern, west-central, and eastern portions of the West Training Area are silt loam associations, while the East Training Area is predominantly shallow silt loam over gravelly sand. Soils in the river floodplains consist of alternate layers of sand, silt loam, and gravelly sand. Highly organic wet soils, underlain by permafrost, and having a high water table characterize muskeg soils. Upland foothills have moist, loamy soils, while mountain soils are rocky, steep, and unvegetated. Lowland soils have moderate erosion potential, while foothill soils have moderate to high erosion potential (USARAK 1979).

Table 4-15. Donnelly Training Area Soil Associations*

Soil Map Unit	Soil Type	Location	Description
1	Typic Cryochrepts in association with Aeric Cryaquept	High terraces, outwash plains, and footslopes - north part of Fort Greely and Donnelly Training Area.	Silt loams, moderately to well drained with underlying gravelly sand.
2	Histic Pergelic Cryaquepts	Broad rolling hills and valleys in the northwest portion of Fort Greely and Donnelly Training Area.	Poorly drained silt loam soils with textures ranging from sand loam to clay loam and are fairly gravelly in areas.
3	Histic Pergelic Cryaquepts in association with Typic Cryofluvents	Level floodplains along the Delta and Tanana rivers.	45% - poorly-drained loams with textures of either silt loam or sandy loam. 35% - alluvial soils of stratified silt loam and sand. Remainder of the soil consists of peat deposits with shallow loam materials over very gravelly sand located in depressions within the floodplain.
4	Afic Cryochrepts in association with Histic Pergelic Cryaquepts	Uplands north of Fort Greely and Donnelly Training Area	35% - well-drained deep silt loams. 20% - poorly drained silt loams with an overlying peat layer and a shallow permafrost table. 10% - moderately drained silt loams and well-drained shallow silt loams over bedrock. Remainder – poorly drained shallow silt loam underlain by permafrost (north facing).
5	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	Uplands to the north of Fort Greely and Donnelly Training Area.	30% - very gravelly silt loam or very gravelly loam. 25% - poorly drained silt loams with overlying peat. Remainder - a mixture of soil types including gravelly and stony silt loams to silt soils.
6	Pergelic Cryaquepts in association with Pergelic Cryochrepts	Foothills and moraines of the Alaska Range in the southern part of Fort Greely and Donnelly Training Area.	40% - poorly drained gravelly and stony loams. 35% - well-drained gravelly and stony loams. Remainder – poorly drained silt loams.
7	Histic Pergelic Cryaquepts	Low slopes subject to seepage and in drainage ways in the southwestern and southeastern portions of Fort Greely	Poorly drained shallow loams with permafrost over very gravelly and stony loam. An overlying peat layer is also present.

Soil Map Unit	Soil Type	Location	Description
		and Donnelly Training Area.	
8	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	Hilly portions along the Delta River in the eastern portion of Fort Greely and Donnelly Training Area.	45% - well-drained silt loams. 30% - poorly drained shallow silt loams. Remainder - a mixture of very gravelly loams and silt loams.
9	Typic Cryochrepts	Terraces, outwash plains, and low moraines along Jarvis Creek.	70% - shallow silt loams. 30% - shallow loams or gravels and poorly-drained silty to gravelly soils.
10	Typic Cryochrepts	Hilly and steep moraines northeast of the Air Drop Zone.	65% - shallow silt loams. Remainder - gravelly loams.
11	Rocklands	Mountainous areas and foothills of the Alaska Range in the southern portion of Fort Greely and Donnelly Training Area.	75% - rockland. Remainder - very gravelly shallow soils.
12	Typic Cryochrepts in association with Histic Pergelic Cryaquepts	Moraines and footslopes to the east of Jarvis Creek.	65% - gravelly silt loams over very gravelly loams. Remainder - gravelly, stony silt loam or sand loam.

*From (Rieger et al. 1979).

Isolated patches of permafrost exist under Fort Greely and Donnelly Training Area's sandy gravel from 2 to 40 feet below ground level. Thickness of permafrost varies between 10 to 118 feet.

4.5.3.4 Water Resources

4.5.3.4.1 Surface Water

Donnelly Training Area lies entirely within the Tanana River drainage basin. Surface water from around the Main Post drains into the Delta River and Jarvis Creek. The West Training Area drains into the Delta River, Delta Creek, East Fork of Little Delta River, Buchanan Creek, and the Little Delta River. The Delta River, Delta Creek, and Little Delta River all drain directly into the Tanana River. Surface water from the East Training Area drains into the Delta River, and Granite, Ober, and Jarvis creeks. The Gerstle River Training Area drains into the Gerstle River and Sawmill Creek, both of which drain into the Tanana River.

Glaciers that lie along or just south of the installation's southern boundary feed most rivers, streams, and creeks. Glacial meltwaters feed the Delta River, Delta Creek, and the Little Delta River from the Alaska Range. Principal glaciers include Canwell, Castner, and Black Rapids (which drain into the Delta River); Trident and Hayes (which drain into Delta Creek); and Hayes and Gillam (which drain into the Little Delta River). Jarvis Creek is fed by meltwater from glaciers on Mt. Silvertip (USARAK 1979). The volume of surface water flow fluctuates dramatically by season. From October to May, flow is limited to groundwater seepage from aquifers into streams, and many small streams freeze solid (zero discharge). Snowmelt typically begins in May and reaches its peak in June. Flows are greatest during June and July.

After July, most of the snow has melted, and a steady flow during August and September is sustained by rainfall.

The state of Alaska has not designated streams on Donnelly Training Area into water-use categories. Without such designations, fresh waters in Alaska are considered to be in their original and natural condition and suitable for all uses. The state of Alaska, Department of Natural Resources has claimed an interest in submerged lands on Donnelly Training Area, and has sought cleanup. Fort Wainwright has respectfully declined taking cleanup action for a number of reasons including excessive land disturbance and habitat loss to ensure cleanup and because the areas in question are part of the post's active ranges. The pH levels in the Delta River and Jarvis Creek are slightly alkaline, but they are within limits established by the state. Dissolved oxygen levels generally vary with water flow; oxygen levels are highest in June, July, and August and they may approach zero during periods of prolonged ice cover (Bonito 1980; USARAK 1979).

Lakes are abundant on Donnelly Training Area, but information on their water quality is scarce. Water samples collected from Bolio Lake had a pH of 8.8 to 9.2, a level beyond acceptable alkalinity as defined by the state. Most nitrogen in Bolio Lake is in organic forms (0.98 mg/l) with low concentrations of nitrates and nitrate nitrogen (0.02 mg/l). Samples collected from Bolio Lake in August 1975, had dissolved oxygen concentrations of 9.8 mg/l near the surface and 10.0 mg/l at a depth of 15 feet. Alaska Department of Fish and Game stocks 19 lakes with sport fish. Most other lakes on Donnelly Training Area are not suitable for stocking, due to poor accessibility or their susceptibility to freezing.

4.5.3.4.2 Groundwater

Although surface water is abundant in the Tanana Basin, most of Donnelly Training Area's water is obtained from wells. Potential groundwater supply is greatest in the floodplain alluvium along the Little Delta River, Delta River, Delta Creek, and Jarvis Creek, and in the alluvial fans extending along the northern flanks of the Alaska Range. The surface to groundwater depth at Donnelly Training Area is between 100 and 210 feet. Most wells on the post tap unconfined aquifers found in unconsolidated alluvial deposits. Groundwater recharge is from influent seepage of glacier-fed streams.

The quality of surface water has remained high throughout Army occupation. There has been no reason to suspect degradation (beyond localized, temporary sedimentation) to Donnelly Training Area surface waters. Limited monitoring of these waters has occurred due to little indication of problems.

4.5.3.5 Climate

Donnelly Training Area has the northern continental climate of interior Alaska, which is characterized by short, moderate summers; long, cold winters; and low precipitation and humidity. Weather is influenced by mountain ranges on three sides that form an effective barrier to the flow of warm, moist maritime air during most of the year. Surrounding upland areas tend to aid drainage and the settling of cold Arctic air into Tanana Valley lowlands.

The Cold Regions Test Center Meteorology Team monitors weather on Fort Greely and around Donnelly Training Area to support test projects. Average monthly temperatures range from -2.8ºF in January to 60.0ºF in July, with an average annual temperature of 28.2ºF. The record low temperature is -63ºF, and the record high is 92ºF. The average frost-free period is 95-100 days (67 years of CRTC Team data). Prevailing winds are from the east-southeast from September through March and from the west, southwest, or south from April through August. Average wind velocity is 8.2 miles per hour (mph). The greatest wind speeds occur during winter, with a high of 85 mph recorded in the month of February. Winds are 5 mph or less only 13.6 percent of the time, and wind speeds greater than 55 mph have been

recorded in every month. Thunderstorms are infrequent and occur only during summer (45 years of CRTC Meteorological Team data).

Average annual precipitation is 12.64 inches, which falls over 90.4 days, mostly during summer and early fall. Average monthly precipitation ranges from a low of 0.20 inches in March to a high of 2.90 inches in July. Average annual snowfall is 45.5 inches, with a record 99.7 inches in 1945 (67 years of CRTC Meteorological Team data). Average annual relative humidity is 55 percent with lowest levels occurring during spring and early summer (38 percent during mid-afternoon in May). Heavy fog is relatively common during October through December, with three or more foggy days occurring each month. Temperature inversions can be pronounced in the Delta Junction area, especially when temperatures drop below - 25°F. Ice fog can be expected any time that temperatures drop to -30°F or lower, but ordinarily ice fog will only occur in areas near human settlements where moisture is exhausted by burning fuels (USARAK 1979).

4.5.4 Biological Resources

4.5.4.1 Flora

Vegetation types of interior Alaska form a mosaic and reflect fire history, slope and aspect, and presence or absence of permafrost (Viereck and Little 1972). Donnelly Training Area has five recognized cover types: ice and snow; alpine tundra; moist tundra; open, low growing spruce forests; and closed, spruce-hardwood forests. The white spruce-paper birch forest of interior Alaska is often called the boreal forest or taiga.

4.5.4.1.1 Vegetative Profile

The huge landscapes at Donnelly Training Area encompass a wide array of physiographic settings. Patterns of vegetation are determined by a variety of natural influences, including climate, topography (slope, aspect, and elevation), glaciation, flooding, depth to water table, and most importantly, permafrost and fire. Wetlands occur at various altitudes and sometimes only during early vegetation successional stages. Local conditions often result in combinations or the absence of a vegetation type when moving up or downslope.

A typical vegetation profile from the north slope of the Alaska Range to the Delta/Tanana River floodplain includes: barren areas (rock, gravel, snow, and/or ice), alpine tundra, moist tundra, forests (black spruce, white spruce, deciduous, and mixed), tall shrubs, barren, and water (Anonymous 1979; Bonito 1980). This vegetation profile does not precisely match Viereck and Little's (1972) vegetation types, which were assessed on a statewide basis.

4.5.4.1.2 Floristics Inventory

During 1997 and 1998 Cold Regions Research Engineering Laboratory conducted a floristic inventory in conjunction with other work at Donnelly Training Area, and collected 723 specimens, *An Inventory of the Vascular Flora of Fort Greely, Interior Alaska* (Racine et al. 2001).. These collections represented 497 vascular plant taxa from 64 families and 198 genera. Eleven of these species represent significant range extensions (>150 km).

Plants were collected from Donnelly Training Area. A total of 1,406 collections were made at 101 sites within this unit. Center for Environmental Management of Military Lands laminated one full set of collected plants for use by the Donnelly Training Area ITAM program. A mounted set was kept at the Donnelly Training Area ITAM office, and an incomplete mounted set was kept by Cold Regions Research Engineering Laboratory (Racine et al. 2001).

From 2001-2011 the Range Training Land Assessment program under the direction of ITAM, increased the taxa list to 560 for Donnelly Training Area. Also a ground truth survey was conducted in 2008-2010 to provide additional data on common cluster plant community groups(Viereck 1992, Level 5) associated with the land cover types (Viereck 1992, Level 4) they are found in, over 6,100 plots were sampled in the Donnelly Region.

4.5.4.1.3 Threatened or Endangered, and Species of Concern Plants

Interior Alaska has no federally-listed threatened, endangered, or candidate plant species. This was expected because there are no listed or candidate species native to interior Alaska.

The following table (Table 4-16) provides information on species of concern found on Donnelly Training Area (Racine et al. 2001). Fifteen of the species collected, that are known to exist within Donnelly, are vascular plants being tracked by the Alaska Natural Heritage Program's (AKNHP) Biological Conservation Database for interior Alaska. Rankings are listed on the Alaska Natural History Preservation's Vascular Plant Tracking List, which was last updated in 2013.

There are no legal ramifications from these listings, rather they are generated by the Heritage Program to help track the occurrence of these taxa across the state as more botanical work is conducted. The categories listed do not indicate known threats to these species, but they do represent the rather few collections known for each taxa in Alaska and the geographic distribution of those collections. All of these taxa are listed for management in the ecosystem management program for Donnelly Training Area.

Table 4-16. Global and Alaska Rankings for Donnelly Training Area Plants.

Species	Common Name	Global Ranking*	Alaska Ranking**
Artemisia laciniata	lacinate sagewort	G4?	S3
Carex atratiformis	scrabrous black sedge	G5	S3
Carex deweyana	Dewey sedge	G5	S2S3
Carex eburnea	bristleleaf sedge	G5	S3
Carex sychnocephala	manyhead sedge	G4	S2
Cryptogramma stelleri	fragile rock-brake	G5	S3S4
Draba incerta	Yellowstone draba	G5	S3
Glyceria pulchella	MacKenzie Valley mannagrass	G5	S3S4
Lupinus kuschei	Yukon lupine	G3G4	S2
Phlox hoodii	spiny phlox	G5	S1S2?
Phlox sibirica ssp. *richardsonii*	Richardson's phlox	G4	S2?
Potamogeton obtusifolius	bluntleaf pondweed	G5	S3
Saxifraga adscendens spp. *oregonensis*	small saxifrage	G5T4T5	S2S3
Sisyrinchium montanum	strict blue-eyed grass	G5	S1
Viola selkirkii	Selkirk's violet	G5?	S3/S4

* Alaska Natural Heritage Program Rare Species Global Rankings G3 Either very rare and local throughout its range or found locally in a restricted range (typically 21-100 occurrences) G4 Apparently secure globally G5 Demonstrably secure globally G#G# Global rank of species uncertain; best described as a range between the two ranks G#T# Global rank of species and global rank of the described variety or subspecies of the species Q Taxonomically questionable ? Inexact
** Alaska Natural Heritage Program Rare Species State Rankings S1 Critically imperiled in state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state (typically 5 or fewer occurrences, or very few remaining individuals or acres) S2 Imperiled in state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (typically 6 to 20 occurrences, or few remaining individuals or acres) S3 Rare or uncommon in the state (typically 21-100 occurrences) S4 Apparently secure in state, with many occurrences S#S# State rank of species uncertain; best described as a range between the two ranks SE possibly introduced

4.5.4.1.4 Ecological Land Classification

U.S. Army Cold Regions Research and Engineering Laboratory (Cold Regions Research Engineering Laboratory) contracted ABR, Environmental Research and Services, Inc., to produce ecological land classification maps for Donnelly Training Area in 1996- 2001. The Ecological Land Classification is a hierarchical means to classify land according to various ecological scales. From 2000-2010 ground truth data was gathered to provide accurate information for land cover types, over 6,170 points were sampled. The ecological land classification mapping was reedited in 2011 after the initial report to update classification changes, mainly disturbances including urban/training land development and wildfires.

Ecodistricts are physiographic units within a climatic region that influence moisture availability and exposure to radiant solar energy and have similar geology, geomorphology, and hydrology. Names of ecodistricts are based on prominent geographic features and broad physiographic landforms. Ecosubdistricts are small physiographic regions having distinct, repeating associations of vegetation, soils, permafrost characteristics, water bodies, and fauna. West Donnelly Training Area is located in the Hayes Mountains, Delta Highlands and Delta Lowlands ecodistricts. East Donnelly Training Area and Fort Greely are located in the Delta Lowlands and are dissected by the middle Tanana Floodplain (Delta River floodplain and Jarvis Creek floodplain). The southern portion of East Donnelly Training Area extends into the Delta Highlands with a small portion (Donnelly Dome) included in the Gakona ecodistrict. By extension from the Fort Greely and Donnelly Training Area ecological land classification, it can be inferred that Gerstle River is located in the Delta Lowlands ecodistrict and Black Rapids is located in the Hayes Mountains ecodistrict.

4.5.4.1.6 Wetlands

Donnelly Training Area's expansive area, extending from the Tanana Lowlands to the foothills of the Alaska Range, supports a wide variety of wetlands. Much of the Tanana Lowlands are underlain by shallow permafrost that impedes soil drainage and drives wetland conditions. The lowlands support forest wetlands dominated by black spruce; numerous scrub-shrub wetlands composed of stunted black spruce and broadleaf shrubs, such as shrub birch, willow, and alder; and emergent wetlands mostly composed of sedges and grasses. In the Lowlands, forest wetlands are dominated by needleleaf trees, such as black spruce, and often have an understory of feather mosses that insulate soils, allowing them to remain frozen for extended periods. Scrub-shrub wetlands are typically composed of stunted black spruce and broadleaf shrubs. Stunted black spruce are common on cold, north facing slopes and valley bottoms, where cold, saturated soils underlain with permafrost prevent growth of larger trees. Scrub-shrub wetlands composed of broadleaf shrubs, such as shrub birch and willow, tend to form in seasonally flooded drainages, on terraces, and in disturbed areas. Emergent wetlands dominated by graminoid species, such as grasses and sedges, occur in seasonally or permanently flooded flat, low-lying areas. They are found on floodplains,

on the margins of ponds and lakes, in sloughs, and in localized depressions. Emergent wetlands also develop in trails established within scrub-shrub wetlands, where they form web-like complexes with the surrounding scrub-shrub.

Wetlands in the foothills of the Alaska Range are predominantly scrub-shrub. At high elevation (> 4,500 feet), wind-tolerant shrubs, such as dryas and dwarf willows, often co-dominate with sedges, grasses, and forbs. At mid to low elevations (≤4,000 feet), wetlands are composed of deciduous and evergreen shrubs, such as shrub birch, blueberry, and Labrador tea,; these wetlands occur on nearly flat to moderately sloping areas underlain by frozen soils. Scrub-shrub communities composed of tall deciduous shrubs, such as willow and alder, are found along drainages and streams.

Three major mapping efforts have been made to identify and classify wetlands and waterbodies in the Donnelly Training Area. In 1994, the National Wetlands Inventory (NWI) produced a digital map of wetlands and waterbodies for approximately 33% of the Donnelly Training Area based on the presence of wetland vegetation interpreted from color-infrared photography; these maps are periodically updated by the NWI using current aerial imagery. In 2000, the U.S. Army Engineer Waterways Experiment Station (WES) completed a wetland delineation of Donnelly Training Area that included a review of existing information, wetland identification and characterization, base map, and final report. In 2010, 2011, and 2012, the Center for Environmental Management of Military Lands (CEMML) produced wetland and waterbody maps based on a review of existing information (e.g., NWI maps, NRCS soil surveys) and field surveys that identify waters of the U.S. as small as 0.1 acre. FWA currently uses CEMML's map for management, planning, and permitting purposes.

4.5.4.1.6 Forest Resources

A forest inventory is an integral part in establishing a plan for managing forest resources. The Donnelly Training Area Ecological Management Unit was inventoried by Directorate of Public Works Environmental Forestry Staff during the 2003 field season. Tree data was collected from permanent plots as part of an ongoing Forest Inventory and Analysis of USARAK (Fort Wainwright) lands.

Stand Delineation and Inventory

Stand timber types were delineated utilizing aerial photography to produce maps that demarcate land into forested and non-forested categories. This process was also used to help identify geographical coordinates for the plots and to establish permanent plots on the ground. Timber stands where further defined into types based on specific characteristics such as species composition, size class, and stocking. These stand types are predefined by the *Alaska Vegetation Classification* (Viereck, et al. 1992). The Fort Wainwright inventory method further stratifies out stands with higher timber value, greater ecological importance, and greater potential for military training. Stand timber typing was confirmed on the ground during stand inventory in 2003. The fixed plot radius sampling method was used for tree data collection. Latest habitat/stand delineation was completed in 2011 by the Salcha Soil and Water Conservation District. Stand timber typing was reconfirmed on the ground in 2010 using ground truth surveys**.**

Forest Land Classification and Timber Volume Summary

The Donnelly Training Area east of the Delta River contains approximately 101,662 acres of land (Table 4-17). Forestlands in this area occupy 42.2% of the land area or 56,715 acres. Non-forestland amounts to 57.8 % of the total land area or 44,947 acres.. Of this amount, there are approximately 19,686 acres of commercial forestland. Commercial forestlands are those lands containing sawtimber and poletimber size classes.

The total volume found in the various types or strata on Donnelly East Training Area is found in Table PD-4. The Donnelly Training Area East reports a total volume of about 11,813,745 cubic feet of commercial timber. There is 27,600,212 board feet (Scribner) and over 225,657 tons of green biomass.

Also provided is potential commercial forests acreage, identified as Timberland, where Donnelly East has 41,744 acres and of that acreage 91.1%, or 88,915 acres is accessible (Accessible meaning not within restricted access or impact areas).

The Donnelly Training Area West, Delta River barrens and lands west, contains about 531,141 acres of land. Forested lands in this area occupy 12.8% of the land area or 56,715 acres. Non-forestland amounts to 87.2 % of the total land area or 320,634 acres. Of this amount, there are approximately 68,184 acres of commercial forestland.

The total volume found in the various types or strata on Donnelly West is also found in Table PD-4. The estimated total volume of timber in this area is 526,815 cubic feet of commercial timber. There is 85,176,749 board feet (Scribner) and over 772,827 tons of green biomass. Also provided is potential commercial forests acreage, identified as Timberland, where Donnelly West has 136,699 acres and of that acreage 65%, or 88,915 acres is accessible (Accessible meaning not within restricted access or impact areas).

Table 4-17. Donnelly Training Area Forest Land Classification and Timber Stand Summary

Forest Category	Total Acreage	Commercial Forest Category	Land Acreage	Percent Total Acres
Donnelly East Ecological Management Unit				
Forested Lands	56,715	Commercial Forest	19,686 (15,987)*	19.4% (81.2%)**
		Non-Commercial Forest	37,029	36.4%
Non-Forested Lands	44,947	Shrub/Scrubland	34,817	34.2%
		Herbaceous	3,931	3.9%
		Barren-Natural/Cultural	5,161	5.1%
		Water Bodies	1,038	1.0%
Total Cubic Feet	**11,813,745 (9,905,170)***	**Total Acres**	**101,662 (90,583)***	**100% (89.1%)****
Total Board Feet	**27,600,212 (22,282,454)***	**Total Timberland Acres**	**41,744**	**41.1%**
Total Green Tons	**225,657 (190,083)***	**Accessible Timberland Acres**	**38,044**	**37.4% (91.1%)****
Donnelly West Ecological Management Unit				
Forested Lands	210,506	Commercial Forest	68,184 (33,921)*	12.8% (49.7%)**
		Non-Commercial Forest	142,322	26.8%
Non-Forested Lands	320,634	Shrub/Scrubland	258,704	48.7%
		Herbaceous	21,867	4.1%
		Barren-Natural/Cultural	5,652	1.1%
		WaterBodies	34,411	6.5%
Total Cubic Feet	**526,815 (244,703)***	**Total Acres**	**531,141 (397,397)***	**100.0% (74.8%)****
Total Board Feet	**85,176,749 (29,502,314)***	**Total Timberland Acres**	**136,699**	**25.7%**

Total Green Tons	**772827 (348,366)***	**Accessible Timberland Acres**	**88,915**	**16.7% (65%)****
Donnelly Combined				
Forested Lands	267,221	Commercial Forest	87,870 (49,908)*	13.9% (56.8%)**
		Non-Commercial Forest	179,351	28.3%
Non-Forested Lands	365,581	Shrub/Scrubland	293,521	46.4%
		Herbaceous	25,798	4.1%
		Barren-Natural/Cultural	10,813	1.7%
		Water Bodies	35,449	5.6%
Total Cubic Feet	**12,340,560 (10,149,873)***	**Total Acres**	**632,803 (487,981)****	**100.0% (77.1%)****
Total Board Feet	**112,776,961 (51,787,768)***	**Total Timberland Acres**	**178,443**	**28.2%**
Total Green Tons	**998,484 (538,449)***	**Accessible Timberland Acres**	**126,959**	**20.1% (71.1%)****

***Indicates acreage/volumes that is accessible.**
**** Percentages are deferred from accessible acreages of corresponding rows.**

Estimated Annual Harvest
An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total existing commercial forest area by the rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The following table has softwood, hardwood, and mixed softwood/hardwood accessible harvest acreage represent saw, pole, and pole/saw timber types; the majority is in the pole/saw type.

Table 4-18. Donnelly Training Area Estimated Accessible Annual Harvest.

Harvest Timber Type	Potential Harvest Land	Rotation Age	Regeneration Time	Total Rotation Length	Estimated Annual Harvest
Donnelly East Ecological Management Unit					
Softwoods	8,725 acres	110 years	10 years	120 years	73 acres
Hardwoods	3,329 acres	70 years	10 years	80 years	42 acres
Softwood/Hardwoods	3,933 acres	110 years	10 years	120 years	33 acres

4.5.4.2 Fauna

4.5.4.2.1 Moose
Moose are the most visible and economically important wildlife species on Donnelly Training Area. The south-central and northeastern portion of the Donnelly Training Area West and the far southern portion of the Donnelly Training Area East are fall concentration areas for moose. Spring and summer concentrations are found in the north-central portion of the Donnelly Training Area West. Winter concentrations are found in the northeastern portions of the Donnelly Training Area West, as well as the northern portion of the Donnelly Training Area East (Bonito 1980). Alaska Department of Fish and Game's Game Management Unit (GMU)20A has one of the state's largest moose harvests, part of which

encompasses Donnelly Training Area West. In 2009 the estimated population size for moose in GMU 20A was 15,677 (with sightability correction factor) out of 5040 mi^2 of moose habitat. The moose density was figured to be 3.1 moose per square mile (Alaska Department of Fish and Game 2010). These are the highest moose densities in Alaska for any comparably-sized area except for a smaller 1890 mi^2 in southern 20D which includes agricultural lands and recent burns with 4.6 moose per square mile (DuBois 2008). GMU 20D encompasses Donnelly Training Area East as well as the Delta Junction Management Area. A 2008 population estimate for southwest 20D was 4,919 (with sightability correction factor. The moose density was 3.9 moose per square mile. This part of 20D is the closest to Donnelly Training Area East.

It is difficult to conduct meaningful moose surveys for Donnelly Training Area alone because of the migratory habits of these animals.

4.5.4.2.2 Bison

Bison were introduced into the Big Delta-Delta Junction area in 1928 after they were extirpated from the area 450-500 years ago. There are now four herds in Alaska; one at Donnelly Training Area and the other three originating from this herd stock. In the 1950s, the Delta bison herd included more than 500 animals. By 1973, the herd was estimated to include 325 animals and by 1980 there were about 300 bison. The herd size was maintained through strict hunting regulations. In 1994, the number of bison in the herd was estimated at 446, with 70 bulls/100 cows and 53 calves/100 cows. During the 1994-95 season, 18 cows and 21 bulls were taken. When winter food is plentiful, the cows have a high birth rate (70%), calf mortality is low (80% survival), and the herd's general health is good. Hunting is the main mortality factor. The Delta cows calve (April through July), primarily in the Delta River basin along terraces and gravel bars on or near the Texas and Washington ranges. Bison are generally off of Donnelly Training Area by late July-early August (USARAK 1979, Kiker and Fielder 1980). DuBois and Rogers (2000) summarized the history, natural history, and management of the herd in the Delta Bison Management Plan 2000-2005. The Delta bison herd is currently being managed by Alaska Department of Fish and Game at a population level of about 360 bison at the pre-calving, with no less than 50 bulls for every 100 cows (Alaska Department of Fish and Game 2004b). An Interim Management Plan 2012 is pending.

4.5.4.2.3 Dall Sheep

Dall sheep (*Ovis dalli*) are found in the Molybdenum Ridge area in the southwestern portion of the Donnelly West Training Area. The population was estimated at less than 100 animals (Bonito 1980). Spiers and Heimer (1990) studied this herd and found five subpopulations. They noted that their movements included lands both on and off Donnelly Training Area. This study found 150 sheep on Donnelly Training Area in winter and 100 in summer.

4.5.4.2.4 Caribou

Of the 32 caribou herds or populations in Alaska (Alaska Department of Fish and Game Wildlife Notebook Series) 2 occur on Donnelly Training Area. The Delta Caribou Herd and the Macomb Caribou Herd. The Delta caribou herd ranges throughout moist tundra habitat along the Alaska Range. This relatively small herd spends spring and summer on calving grounds in the Trident Glacier foothills and then moves to the west of Donnelly Training Area for the winter (USARAK 1995b). Alaska Department of Fish and Game identified the Donnelly Dome area as winter habitat for caribou. In 1963, the herd was estimated at 5,000 head that ranged over 3,000 square miles. By 1974, the herd dropped to 1,400-2,000 animals (USARAK 1979). In 1979, the herd was estimated at about 4,000 animals with a high (63:100) calf/cow ratio (Spiers 1982). Alaska Department of Fish and Game estimated the 2007Delta Caribou Herd population to be 2985 (Alaska Department of Fish and Game 2008).

The Macomb caribou herd occupies the mountains of the eastern Alaska Range from the Delta River to the Mentasta Highway. Their core range is in unit 20D between the Robertson River and the Richardson

Highway, and their primary calving grounds are on the Macomb Plateau the Macomb herd also uses the lowlands of the Tanana River drainage as winter range. Alaska Department of Fish and Game estimated the 2008 Macomb Caribou Herd population to be approximately 754 (Alaska Department of Fish and Game 2009).

4.5.4.2.5 Other Mammal Species

Large predators include grizzly (*Ursus arctos*) and black (*Ursus americanus*) bears, wolves(*Canis lupus*), red foxes(*Vulpes vulpes*), American marten (*Martes americana*), coyotes (*Canis latrans*), and wolverines (*Gulo gulo*). Many of these species, in addition to mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), and beaver (*Castor canadensis*) are trapped for fur on Donnelly Training Area. There is no accurate harvest or population data for these species. Small mammals that are potentially rare inhabitants of Donnelly Training Area that have not been documented include the long-tailed vole (*Microtus longicaudus*), yellow-cheeked vole (*M. xanthognathus*), Alaska tiny shrew (*Sorex yukonicus*), and water shrew (*S. palustris*) (Anderson et al. 2000).

Several small game and related species are found on Donnelly Training Area, including snowshoe hare (*Lepus americanus)* willow (*Lagopus lagopus*) and rock (*L. mutus*) ptarmigan; spruce (*Falcipennis Canadensis)*, sharp-tailed (*Tympanuchus phasianellus*), and ruffed (*Bonasa umbellus*) grouse; swans; ducks; geese; and cranes. Waterfowl nest on Donnelly Training Area pothole lakes and are absent from the area during winter. There are no accurate harvest or population data for these species.

4.5.4.2.6 Birds

Anderson et al. (2000) conducted landbird surveys in 1998 on Donnelly Training Area. Some common nongame birds observed on the installation include the alder flycatcher (*Empidonax alnorum*), American kestrel (*Falco sparverius*), hawk owl (*Surnia ulula*), great-horned owl (*Bubo virginianus*), yellow-rumped (*Dendroica coronata*) and orange-crowned warbler (*Vermivora celata*), common (*Carduelis flammea*) and hoary redpoll (*Carduelis hornemanni*), dark-eyed junco (*Junco hyemalis*), hairy woodpecker (*Picoides villosus*), black-backed woodpeckers (*Picoides arcticus*), red-tailed hawk (*Buteo jamaicensis*), mew gull (*Larus canus*), gray jay (*Perisoreus canadensis*), common raven (*Corvus corax*), black-capped chickadee (Poecile atricapilla), American robin (*Turdus migratorius*), varied thrush (*Ixoreus naevius*), hermit thrush (*Catharus guttatus*), Swainson's thrush (*Catharus ustulatus*), gray-cheeked thrush, (*Catharus minimus*) Bohemian waxwing (*Bombycilla garrulus*), snow bunting (*Plectrophenax nivalis*), and cliff swallows (*Petrochelidon pyrrhonota* (*Hirundo pyrrhonota*)) (USARAK 1979).

Sandhill crane habitat exists on Donnelly Training Area. Cranes are common migrants but it is unknown if any nesting occurs. A survey for trumpeter swans in 2001 found 56 swans on the installation including 26 cygnets (Amji and Payne, 2006). Trumpeter swan surveys conducted by U.S. Fish and Wildlife Service in 1990, 1995, and 2000 covered parts of Donnelly Training Area including kettle lakes in the southwest portion of the Donnelly West Training Area, and along the Delta River.

4.5.4.2.7 Fish

The Delta River is important fall chum salmon (*Oncorhynchus keta*) and coho (*Oncorhynchus kisutch* (Walbaum)) spawning habitat, although the latter are more common in Clearwater Creek. Salmon spawn at the mouth of the Delta River and do not occur in upstream sections including Donnelly Training Area. Major streams on Donnelly Training Area (e.g., Delta River, Delta Creek, Jarvis Creek and 100 mile Creek) support Arctic grayling throughout the open water season. A few clear streams flowing into these larger streams provide summer habitat for grayling, but none are important for spawning grayling (Bureau of Land Management and U.S. Army 1994a).

While some lakes and ponds on Donnelly Training Area have naturally occurring populations of lake chub (*Couesius plumbeus*), northern pike, sculpin, and suckers, most are too shallow or oxygen deficient

in the winter to support fish. Alaska Department of Fish and Game stocks 16 Lakes on Donnelly Training Area with silver salmon (*Oncorhynchus kisutch*) , Arctic grayling (*Thymallus arcticus (Pallus*)), Arctic char (*Salvelinus alpinus*), lake trout (*Salvelinus namaycush*), and rainbow trout (*Oncorhynchus mykiss*), (PMO data, ERD 2000). Annual fishing visits to these lakes average about 1400 angler-use days. Most of these lakes are readily accessible from the Richardson Highway. Koole Lake is west of the Delta River and is inaccessible by road (Bureau of Land Management and U.S. Army 1994b).

4.5.4.2.8 Reptiles and Amphibians

Wood frogs (*Rana sylvatica*) are the only amphibians in the Alaska Interior, and they are found on Donnelly Training Area. There are no reptiles.

4.5.4.2.9 Special Status Fauna

The American peregrine falcon was de-listed from endangered species status in 1999. Breeding has been documented on Donnelly Training Area along the Delta River, Delta Creek and the Little Delta River in recent years. Although this raptor has been recently delisted, the U.S. Fish and Wildlife Service requests that Fort Wainwright continue consultation on any projects that may hinder their recovery. Peregrine falcons do not winter in Alaska.

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act. Both species are documented breeders on DTA. A Bald Ealge nest was identified on the East Fork of the Little Delta River in 2010 and remains active. There are two known historical nesting territories on DTA. One is on the south side of Moly Ridge and the other in the south side of Donnelly Dome. These nests require protection and revisits to determine occupancy.

The U.S. Fish and Wildlife Service, Office of Migratory Bird Management maintains a list of *Birds of Conservation Concern* for each bird conservation region. Species listed for this ecoregion of Alaska that have been documented on DTA are Horned Grebe, Peregrine Falcon, Solitary Sandpiper, Lesser Yellowlegs, Upland Sandpiper, Whimbrel, Hudsonian Godwit, Olive-sided Flycatcher, Smith's Longspur, and Rusty Blackbird.

DTA contains nineteen of the species included on the Boreal Partners in Flight *Priority Species of Conservation* list for monitoring because of declines in populations noted across the Americas. These species are Gyrfalcon, Hammond's Flycatcher, Blackpoll Warbler, White-tailed Ptarmigan, Northern Shrike, Golden-crowned Sparrow, Sharp-tailed Grouse, American Dipper, Smith's Longspur, Great Gray Owl, Gray-cheeked Thrush, Rusty Blackbird, Boreal Owl, Varied Thrush, White-winged Crossbill, Black-backed Woodpecker, Bohemian Waxwing, Olive-sided Flycatcher, and Townsend's Warbler.

Six species from the Bureau of Land Management’s *Alaska Sensitive Animal List*. occur on DTA lands: Trumpeter Swam, Golden Eagle, Short-eared Owl, Olive-sided Flycatcher, Blackpoll Warbler, and Rusty Blackbirds.

At this time there are no legal requirements for managing the species, but attention should be given to protecting habitats.

4.5.4.3 Special Interest Management Areas

Donnelly Training Area has several areas with special natural features. They harbor sensitive or unique wildlife species or represent unique plant communities. The following are special area categories and accompanying restrictions. Most areas either have been or soon will be digitized in the Geographic Information System, and maps showing restricted areas will be available to project planners.

4.5.4.3.1 Delta Bison Area

A 1980 cooperative agreement (Bonito 1980) designated areas as important bison calving and summer range on the Donnelly West Training Area. The 1980 agreement also identified the Donnelly East Training Area as important late summer and early winter range. An agreement in 1986 with Alaska Department of Fish and Game (U.S. Army 1986) also identified bison calving and summer range. Fort Wainwright has imposed restrictions to limit disturbance to bison calving areas from 15 April through 15 June, if bison are present.

4.5.4.3.2 Sandhill Crane Roosting Area

The 1986 agreement with Alaska Department of Fish and Game (U.S. Army 1986) identified several areas along the Delta River on Donnelly Training Area as important for migrating Sandhill cranes (*Grubs canadensis*). Consultation with Alaska Department of Fish and Game for the military Lands Withdrawal Renewal EIS identified additional areas along the Delta Creek wash, near the Delta Creek Assault Landing Strip, as important for migrating sandhill cranes (Center For Ecological Management Of Military Lands 1998). The agreement limited disturbance in designated sandhill crane areas each year from 25 April through 15 May, and 1 September through 30 September when sandhill cranes are present. Survey data collected between the dates of 25 April and 15 May during the years of 2005 – 2012 have resulted in 0 observations of sandhill cranes roosting on the Delta River however observations in September show continued significant use.

4.5.4.3.3 Delta Caribou Calving and Post-Calving Areas

The cooperative agreement between the Army and Alaska Department of Fish and Game (U.S. Army 1986) identified 12 parcels on Donnelly Training Area as important calving and post-calving areas for caribou. In the 1986 agreement, the Army agreed to suspend activities or operations that would adversely affect these areas during 15 May through 31 May without consultation with Alaska Department of Fish and Game. Restrictions in these areas are in effect only when caribou are present. In addition, all development and military actions in the caribou calving grounds will be conducted under winter conditions when there is sufficient snow cover and the ground is adequately frozen to minimize the damage to vegetation and soils.

4.5.5 Donnelly Training Area Cultural Resources

The Donnelly Training Area has supported human populations for at least the last 10,000 years. This area was an extremely popular hunting area in prehistoric times. Archaeological surveys have taken place in the region since 1963 and over 450 sites are known from glacial moraines, bluff edges, and overlooks in the training area. Twenty of these sites comprise the Donnelly Ridge Archaeological District, which is within Donnelly Training Area East. The majority of the archaeological surveys conducted in Donnelly Training Area have been limited to Donnelly Training Area East, but in recent years survey efforts have expanded to the Molybdenum Ridge area in Donnelly Training Area West where 25 sites were found in 2011 and 2012. Forty-eight sites (including 2 historic sites) in Donnelly Training Area are eligible for the National Register of Historic Places.

4.5.6 Donnelly Training Area Management Prescriptions

Donnelly Training Area primarily consists of lands withdrawn under PL 106-65 and is managed as a part of BLM's Fort Greely Resource Management Plan. Table AB-1, Appendix A demonstrates consistency between this INRMP and the Fort Greely Resource Management Plan.

4.5.6.1 Donnelly Training Area East Sub-Unit

The Donnelly East Training Area consists of one ecological management unit called Donnelly East. The Donnelly East ecological management unit consists of all of Donnelly Training Area east of the Delta River, except for the area commonly known as the keyhole, which is private land that surrounds the Richardson Highway. Donnelly East is made up of two sub-units.

The first sub-unit is the Ranges sub-unit. The Ranges sub-unit includes all of the firing ranges that make the Wills Range Complex, Texas Range and Washington Range.

The second sub-unit is Donnelly East Training Areas sub-unit. This sub-unit consists of all remaining areas in Donnelly East Ecological management unit not included in the Ranges sub-unit.

4.5.6.1.1 Military Use

The Donnelly East Training Area is used primarily as a maneuver area. Battalion-sized and larger elements of the 172nd Infantry Brigade train throughout the year. Training exercises may include deployment of troops by truck and helicopter, field bivouac, and construction of temporary fighting/defensive positions. Exercises typically involve approach marches, weapons firing, and infantry tactical maneuvers. Cold Regions Test Center utilizes the East Training Area for experimental airdrops; airborne training; and testing of clothing, vehicles, and equipment.

The Ranges sub-unit is suitable for direct and indirect fire weapon training and aerial gunnery exercises. Small arms munitions impact the area. This sub-unit has been classified for small arms, as a non-dud producing impact area. Other compatible uses include live-fire maneuver training, remote monitoring of natural resources and military impacts, and limited on-the-ground natural resources management. Other activities that are not compatible with this sub-unit include most on-the-ground natural resources management, digging without a permit from the Army Corps of Engineers, mineral or vegetative extraction, hunting, fishing, trapping, bird watching, off-road recreational vehicles of any kind, dog sledding, airboats, camping, new construction, easements, and leases.

The Donnelly East Training Areas sub-unit is suitable for indirect fire weapons, aerial gunnery, small arms, platoon- to brigade-sized exercises, company-sized live-fire exercises, road marches, and bivouacs. This sub-unit is primarily used for large-scale military training exercises, airborne drops, and winter bivouacs. The recommended time for military activities in low areas for mechanized vehicles is between freeze-up and spring break-up. Donnelly, Bear, Fox Drop, and Buffalo Drop Zones and Donnelly Assault Air Strip will sustain year-round use. Butch Drop Zones will sustain only winter use. Other compatible uses include natural resources management, habitat improvement, mineral or vegetative resources extraction, hunting, fishing, trapping, bird watching, hiking, skiing, dog sledding, and off-road recreational vehicle use. Activities that are not compatible with the Donnelly East Training Areas sub-unit include digging without a permit, and any permanent nonmilitary structures, easements, or leases.

4.5.6.1.2 Natural Resources Management

Natural resource management priority for Donnelly East is "*full*". Fire suppression category for all of Donnelly East is "*full*", except for the very northern tip of Donnelly East, which is "*critical*". BLM retains vegetation management rights for all of Donnelly Training Area. Hunting, trapping and fishing is "*open*" in Donnelly Training Area East Recreation Areas 1-4, but is "*closed*" in the training areas west of Meadows Road, Battle Area Complex and Combined Arms Collective Training Ranges, Texas and Washington Ranges, and in the Small Arms Complex. Recreation use for off-road recreational vehicles is "*open*" in Donnelly Training Area East Recreation Areas 1, 2, 3, and 4. All other areas on Donnelly East are "*closed*" to off-road recreational vehicle use.

Table 4-19. Donnelly East Training Area Ecosystem Management Prescriptions.

Ecosystem	Natural	Fire	Vegetation	Hunting	Fishing	Recreational

Management Sub-Unit	Resource Management Priorities	Suppression Category	Management	and Trapping		Use Management
Donnelly East Training Area Recreation Areas East of Meadows Road	Full	Full	BLM	Open	Open	Open
Donnelly East Training Areas West of Meadows Road	Full	Full	BLM	Closed	Closed	Closed
BAX / CACTF	Full	Full	BLM	Closed	Closed	Closed*
Texas / Washington Ranges	Full	Full	BLM	Closed	Closed	Closed
Small Arms Complex	Full	Full	BLM	Closed	Closed	Closed

*33 Mile Loop remains open except when ranges are in use.

Donnelly East Training Area is not an approved federal or state subsistence area. There is no subsistence preference for any subsistence user but any subsistence user may conduct approved subsistence activities after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and Executive Orders pertaining to natural resources management on Donnelly East Training Area. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of National Environmental Policy Act, Geographic Information System, and other decision support systems, and integration with other land management programs such as Sustainable Range Program and Sustainment, Restoration and Modernization Program.

4.5.6.1.3 Access

Public access is allowed in the Donnelly East Training Areas sub-units for recreation, subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander. Access is not permitted to unauthorized personnel in the Ranges sub-unit. The Texas Range is covered by R-2202A and R-2202C restricted airspace. R2202A covers up to but not including 10,000 feet mean sea level. R-2202C covers 10,000 feet mean sea level to unlimited. Eielson Range Control will activate one or both restricted airspace coverages based on the Air Force's needs. Access into the Wills Range Complex and Texas Range on the ground is prohibited. Military personnel may request permission to enter this sub-unit, and if permission is granted, explosive ordnance personnel must accompany them.

4.5.6.1.4 Outdoor Recreation

Donnelly Training Area-East is open to off-road recreational vehicles. Vehicles over 1500 lbs GVWR must stay on improved roads. These roads include 33-mile loop to Butch Lake, Meadows, Dome, Windy Ridge, Twin Lakes, 12-mile crossing, and the Old Richardson Highway. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs or less unless there is a potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. Motorized watercraft must stay within existing open water channels.

There is no recreational activity of any type permitted within the Fort Greely Missile Defense Area and Texas and Washington Ranges, Wills Small Arm Complex, or within 100 Meters of all structures/towers and those other permanently closed/off-limits areas. If additional potentially dangerous sites are found, the federal government would close them to public use. Figure 4-8 shows the recreation use areas on Donnelly Training Area East.

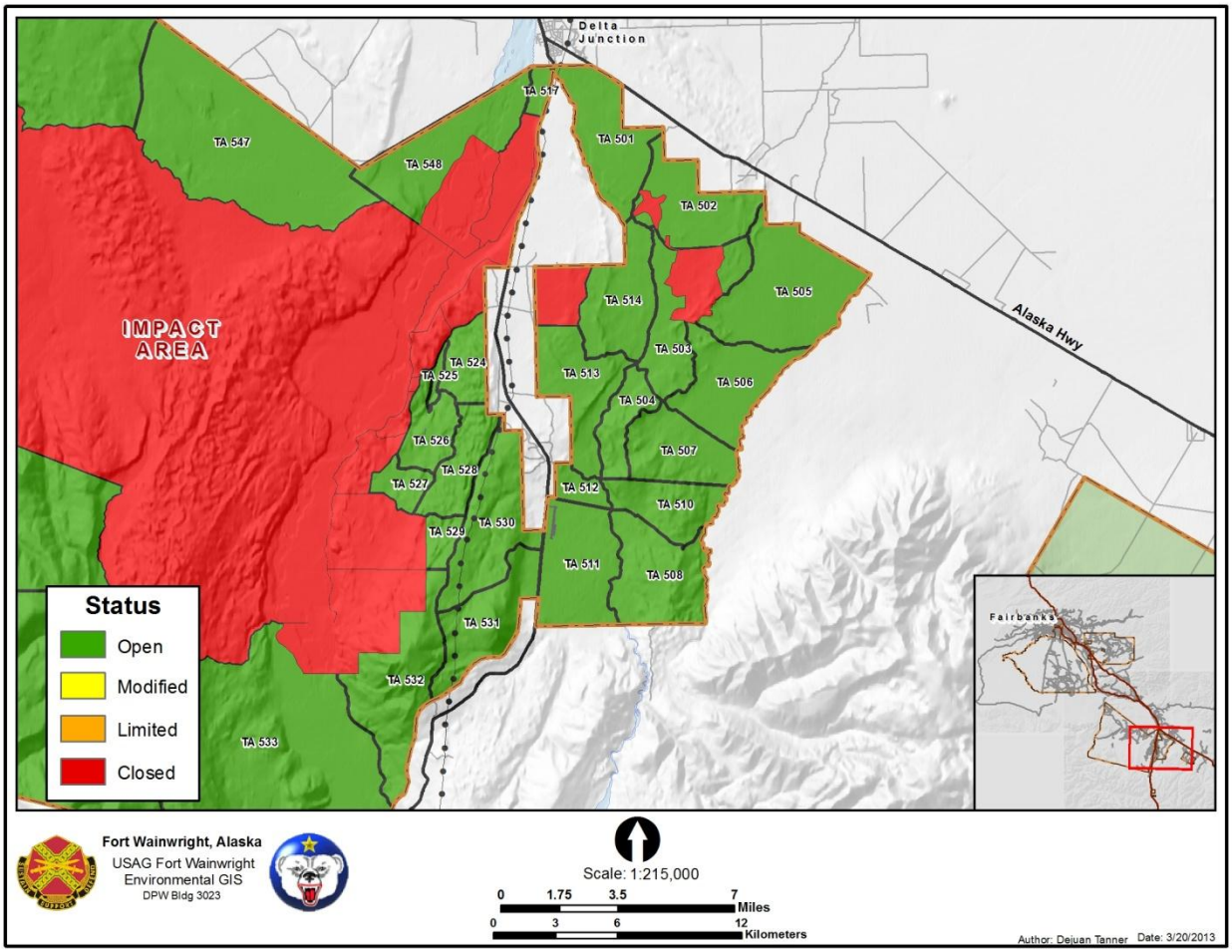


Figure 4-8. Donnelly East Training Area Recreation Use Areas.

4.5.6.2 Donnelly Training Area West Training Area Sub-Unit

The Donnelly West Training Area consists of one ecological management unit called Donnelly West ecological management unit. The Donnelly West ecological management unit covers all of Fort Greely and Donnelly Training Area west of and including the Delta River. The Donnelly West unit consists of flat, lowland wetlands in the north, portions of the Alaska Range in the south, and most of the Delta

floodplain ecodistrict. The Delta River unit contains numerous braided channels and riverbed deposits. The Donnelly West Impact Areas sub-unit consists of Oklahoma, Delta Creek, Lakes, Washington and Mississippi Impact Areas.

4.5.6.2.1 Military Use

The Donnelly West Training Area is used for training and testing weapons and equipment (including experimental designs) under conditions of extreme cold. Weaponry testing include rockets, mortars, small arms, and artillery. The Donnelly West Training Area also is used for testing wheeled and tracked vehicles. The Donnelly West Training Areas sub unit is used primarily for winter exercises only and is suitable for foot training at any time of year.

The Donnelly West Impact Area sub-unit is used for aerial gunnery, surface-to-air, and direct and indirect firing and is the ground and associated airspace within the training complex used to contain fired or launched ammunition and explosives and resulting fragments, debris, and components from various weapons systems. The Lakes Impact Areas are primarily used for live-fire exercises and act as a buffer to Oklahoma Impact Area to the west and Mississippi and Washington Impact Areas to the east. This impact area can also be used for aerial gunnery, surface-to-air, and direct and indirect firing. Impact areas are the ground and associated airspace within the training complex and are used to contain fired or launched ammunition and explosives and resulting fragments, debris, and components from various weapons systems.

The Donnelly West Impact Area sub-unit is suitable for indirect fire weapon training and aerial gunnery exercises. The area is impacted by small arms and dud-producing munitions. USAF uses the Oklahoma/Delta Creek Impact Area as its primary tactical air-to-ground weapons range, and for low and high altitude bombing by B1 and B52 aircraft. This sub-unit has been classified as a high hazard impact area. Other compatible uses include remote monitoring of natural resources and military impacts, and prescribed burning to reduce fire hazards and improve habitat. Military maneuver is prohibited in the Donnelly West Impact Areas sub-unit. There is hazard of unexploded ordnance in this area. Commanders will ensure that safety personnel maintain surveillance of the area and have the officer-in-charge suspend firing immediately at the approach of an aircraft.

4.5.6.2.2 Natural Resources Management

Natural resources priority for Donnelly West Training Areas is "*modified*" while the priority for all impact areas is "*limited*". Fire suppression category for all of Donnelly west is "*limited*". Bureau of Land Management retains vegetation rights for all of Donnelly West. Hunting, trapping and fishing are "*open*" in Donnelly West Training Areas and are "*closed*" in all impact areas. Off-road recreational vehicles are prohibited from entering any of the impact areas on Donnelly West. Recreational use management is "*modified*" for the Donnelly West training areas and "*closed*" for the impact areas.

Table 4-20. Donnelly West Training Area Ecosystem Management Prescriptions.

Ecosystem Management Sub-unit	Natural Resource Management Priorities	Fire Suppression Category	Vegetation Management	Hunting and Trapping	Fishing	Recreational Use Management
Donnelly West Training Area Recreation Areas	Modified	Limited*	BLM	Open	Open	Modified
Washington and Mississippi	Limited	Limited	BLM	Closed	Closed	Closed

Impact Areas						
Lakes Impact Areas	Limited	Limited	BLM	Closed	Closed	Closed
Oklahoma and Delta Creek Impact Areas	Limited	Limited	BLM	Closed	Closed	Closed

*The very northern portion of these training areas is designated "modified" fire suppression category.

Donnelly West Training Area is not an approved federal or state subsistence area. There is no subsistence preference for any subsistence user but any subsistence user may conduct approved subsistence activities after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and Executive Orders pertaining to natural resources management on Donnelly West Training Area. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of National Environmental Policy Act, Geographic Information System, and other decision support systems, and integration with other land management programs such as Sustainable Range Program and Sustainment, Restoration and Modernization Program.

4.5.6.2.3 Access

Public access into the Donnelly West Training Areas sub-unit is allowed for recreation, subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander.

Access into the Donnelly West Impact Areas sub-unit is prohibited. Due to the dangers of unexploded munitions inherent in impact areas, the Washington, Mississippi, Delta Creek, and Oklahoma Range impact areas are closed to all public access and use. Uses, such as mining, timber harvest, and scientific investigations, and access for such use may not be conducted in these areas. These areas are closed to off-road vehicle (ORV) use, unless specifically approved for a particular use. Military personnel may request permission to enter this sub-unit, and if permission is granted, personnel must be accompanied by Explosive Ordnance Disposal personnel. Oklahoma/Delta Creek Impact Area has been designated as restricted airspace by the Federal Aviation Administration and can be closed to all aircraft during periods of scheduled firing. If additional potentially dangerous sites are found outside of existing closed impact areas, the Army would close them to public use.

4.5.6.2.4 Outdoor Recreation

There is no recreational activity of any type permitted within the the Delta Creek, Washington, Mississippi, Oklahoma, Kansas, Nevada, Oregon, Michigan Lakes Impact Areas, or within 100 Meters of all structures/towers and those other permanently closed/off-limits areas. If additional potentially dangerous sites are found, the federal government would close them to public use.

Donnelly Training Area-West is open to all off-road recreational vehicles. Vehicles over 1500 lbs GVWR must stay on improved roads. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs

or less unless there is a potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. Motorized watercraft must stay within existing open water channels. Figure 4-9 shows the recreation use areas on Donnelly West Training Area.

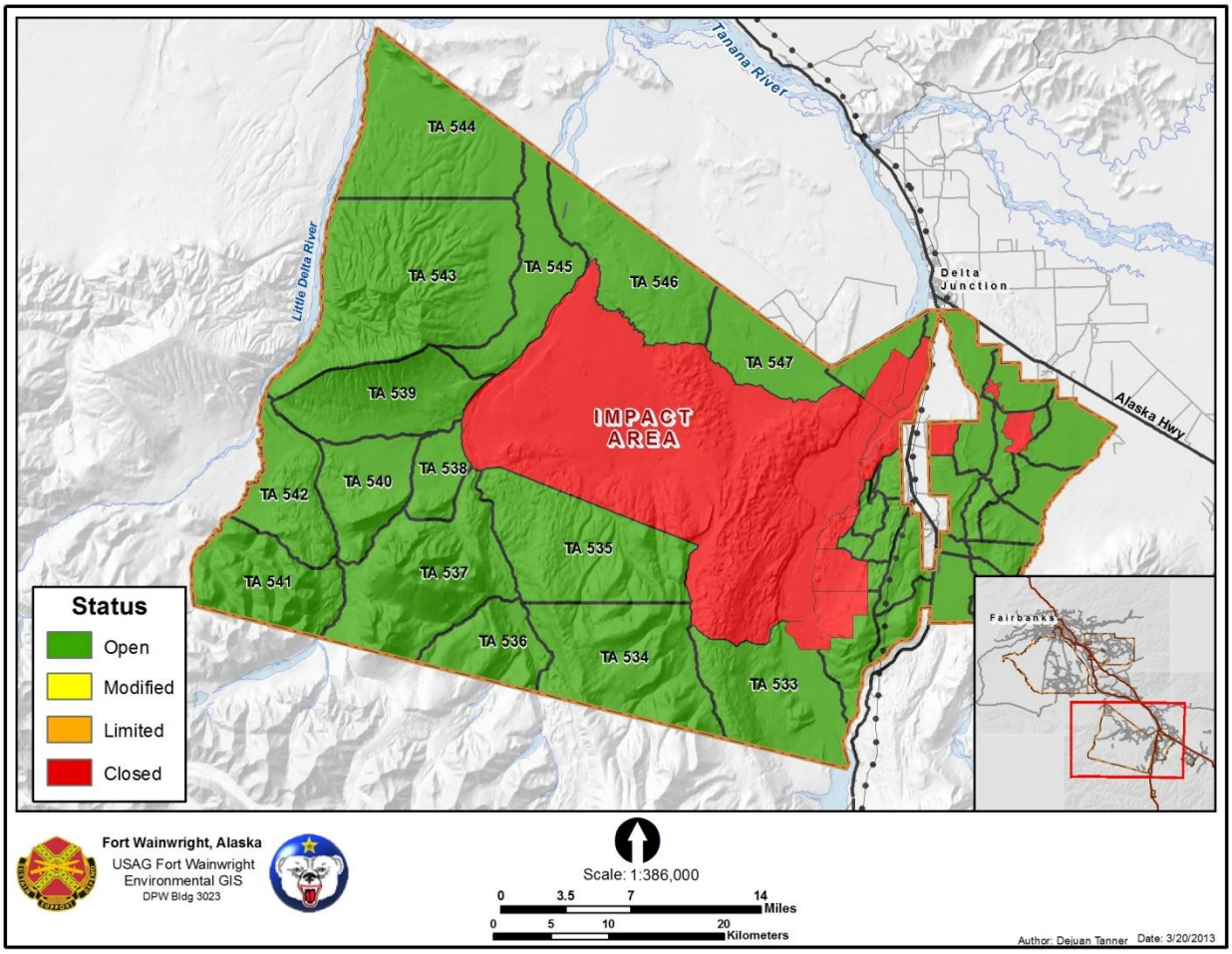


Figure 4-9. Donnelly West Training Area Recreation Use Areas.

4.5.7 Donnelly Training Area Projects

4.5.7.1 Donnelly Training Area East Projects

Appendix A, Table AC-4 lists example Donnelly East Training Area ecosystem management projects.

4.5.7.2 Donnelly Training Area West Projects

Example Donnelly West ecosystem management projects are shown in Appendix A, Table AC-5.

4.6 Gerstle River Training Area Ecological Management Unit

4.6.1 Location

Gerstle River Training Area, formerly known as Gerstle River Test Site, is located approximately twenty miles southeast of Delta Junction, Alaska. The Gerstle River Training Area lies between Granite Mountain and Gerstle River, about three miles south of the Alaska Highway; the rectangular area is oriented northwest to southeast and measures about five miles, north to south, and nine miles, east to west. Gerstle River Training Area, withdrawn indefinitely under Public Land Order 910, is approximately 20,580 acres. Gerstle River Training Area is shown in Figure 4-10.

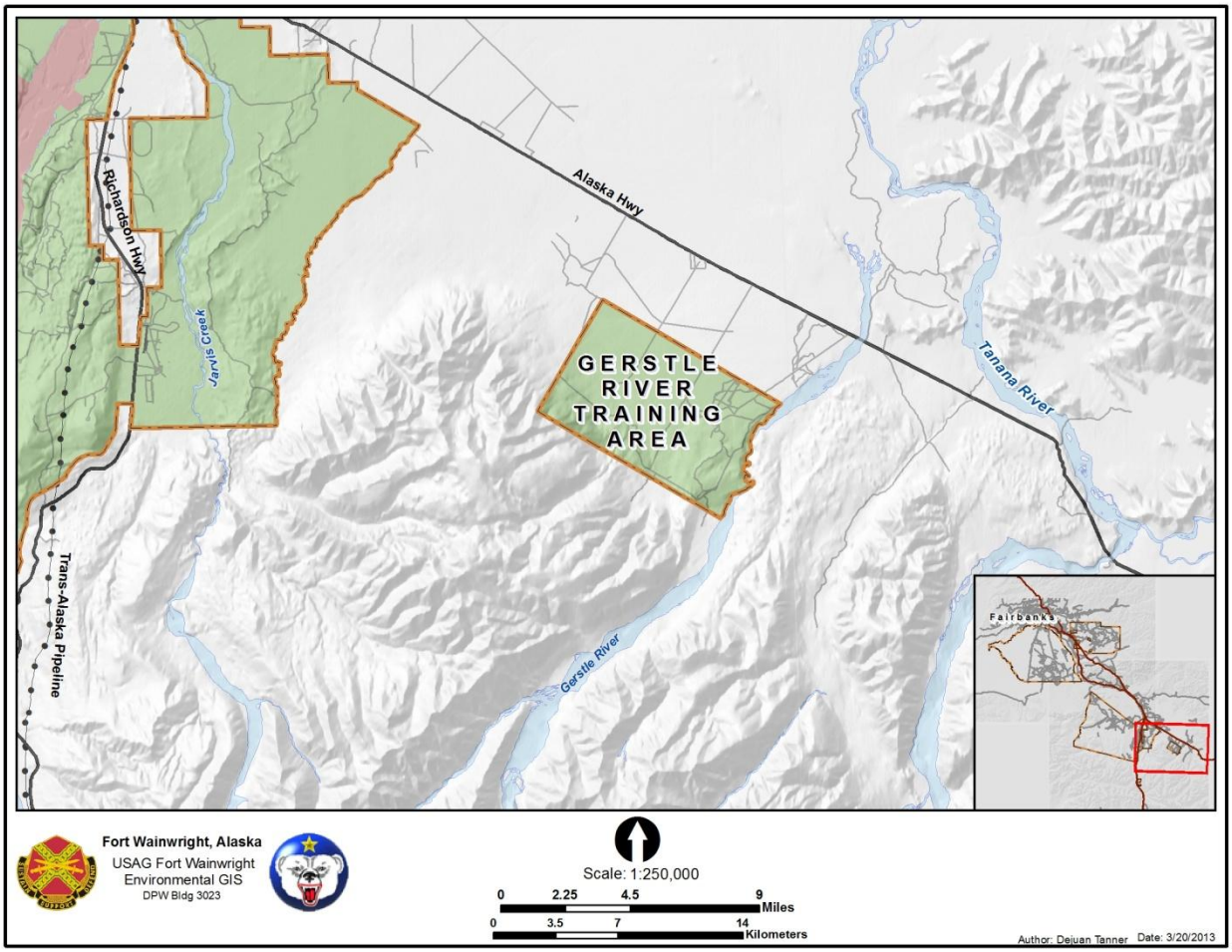


Figure 4-10. Gerstle River Training Area

4.6.2 Gerstle River Training Area Facilities

There are no permanent facilities on Gerstle River Training. Except for a small off limits area, Gerstle River Training Area is a light training area. Gerstle River is reached by a gravel road off of the Alaska Highway.

4.6.3 Physical Resources

Gerstle River Training Area lies north of the Alaska Range, in the Tanana River watershed. The area has a number of features associated with past and present glacial activities, including terminal moraines, outwash fans, braided streams, kettle lakes, and loess deposits.

Climatic fluctuations during the Quaternary Period caused glacial expansion and recession (Racine and Walters 1991). While central Alaska was not glaciated, glaciers during glacial advances surrounded the area. Rivers flowing from glaciers deposited several hundred feet of silt, sand and gravel in the Tanana and Yukon valleys. Most of Gerstle River Training Area is composed of these Quaternary deposits.

The Denali Fault extends through the Alaska Range just south of Gerstle River Training Area and slip on this fault is on the order of 1 cm per year (Matmon et al. 2004).

Petroleum and mineral rights management on withdrawn lands is the responsibility of the Bureau of Land Management. Many glacial deposits in the area are good sources of sand and gravel for aggregate or base course materials.

Soils on Gerstle River Training Area have not been mapped.

Isolated patches of permafrost exist under Gerstle River Training Area sandy gravel from 2 to 40 feet below ground level. Thickness of permafrost varies between 10 to 118 feet. Existing and abandoned river channels, lakes, wetlands, and other low-lying areas are permafrost-free (Williams 1970).

The Gerstle River Training Area lies entirely within the Tanana River drainage basin. Sawmill Creek drains the majority of the Gerstle River Training Area, while some drains into the Gerstle River. Both are tributaries of the Tanana River.

Gerstle River Training Area has the northern continental climate of interior Alaska, which is characterized by short, moderate summers; long, cold winters; and low precipitation and humidity. Weather is influenced by mountain ranges on three sides that form an effective barrier to the flow of warm, moist maritime air during most of the year. Surrounding upland areas tend to aid drainage and the settling of cold Arctic air into Tanana Valley lowlands.

4.6.4 Gerstle River Training Area Biological Resources

4.6.4.1 Flora

Vegetation types of interior Alaska form a mosaic and reflect fire history, slope and aspect, and presence or absence of permafrost (Viereck and Little 1972). Gerstle River Training Area has two recognized cover types: open, low growing spruce forests; and closed, spruce-hardwood forests. The white spruce-paper birch forest of interior Alaska is often called the boreal forest or taiga.

4.6.4.1.1 Vegetative Profile

Patterns of vegetation at Gerstle River Training Area are determined by a variety of natural influences, including climate, topography (slope, aspect, and elevation), glaciation, flooding, depth to water table, and most importantly, permafrost and fire. Wetlands occur at various altitudes and sometimes only during early vegetation successional stages. Local conditions often result in combinations or the absence of a vegetation type when moving up or downslope. Each cover type is described below.

A typical vegetation profile from the north slope of the Alaska Range to the Tanana River floodplain includes: barren areas (rock, gravel, snow, and/or ice), alpine tundra, moist tundra, forests (black spruce, white spruce, deciduous, and mixed), tall shrubs, barren, and water (USARAK 1979; Bonito 1980). This

vegetation profile does not precisely match Viereck and Little's (1972) vegetation types, which were assessed on a statewide basis.

4.6.4.1.2 Threatened or Endangered, and Species of Concern Plants

The Gerstle River Ecological Management Unit shares only one species of concern with that of Donnelly Training Area, *Carex atratiformis*. Refer to Table 4-16 for the list of 15 species that occur on the Donnelly Training Area. Unlike Donnelly, Gerstle River Training Area has not undergone significant survey sampling to conclude that species of concern listed under the Alaska Natural Heritage Program is similar to Donnelly's list.

4.7.4.1.3 Floristic Inventory

A floristic inventory of Donnelly Training Area was conducted by ABR and others in 1998, *An Inventory of the Vascular Flora of Fort Greely, Interior Alaska* (Racine et al. 2001). It did not cover Gerstle River Training Area; this area has since been surveyed and botanized. In 2009 a ground truth survey was performed where 778 plots were sampled and in 2008-09 Donnelly RTLA, under the ITAM program, crews made trips to botanize Gerstle River resulting in a new list of 141 species.

4.7.4.1.4 Ecological Land Classifcation

U.S. Army Cold Regions Research and Engineering Laboratory (Cold Regions Research Engineering Laboratory) contracted ABR, Environmental Research and Services, Inc., to produce ecological land classification maps for Donnelly Training Area. The Gerstle River Ecological Management Unit was not included in this map and final report. The Ecological Land Classification is a hierarchical means to classify land according to various ecological scales. In 2008-2010 a ground truth survey was implemented to provide accurate data for land cover types, over 1,200 points were sampled. The ecological land classification mapping was completed and added to an updated map version. Gerstle River Training Area is located in the Delta Lowlands ecodistrict.

4.7.4.1.5 Forest Resources

A forest inventory is an integral part in establishing a plan for managing forest resources. The Gerstle River Test Site project area was initially inventoried by Directorate of Public Works Environmental Forestry Staff during the 2000 field season. In 2003 permanent fixed radius sampling plots were installed as part of a continuous forest inventory survey (CFI) initiative, and will be monitored through time allowing for future forest analysis.

Stand Delineation and Inventory

Initial stand timber types were delineated using aerial photographs taken in 1995. This process was also used to help identify geographical coordinates for the plots and to establish permanent plots on the ground. Stand timber typing was confirmed on the ground during stand inventory back in 2003. The variable plot radius and fixed plot radius sampling method was used for tree data collection to determine stand volume. Timber stands where further defined into types based on specific characteristics such as species composition, size class, and stocking. These stand types are predefined by the Alaska Vegetation Classification system (Viereck, et al. 1992). The Fort Wainwright inventory method further stratifies out stands with higher timber value, greater ecological importance, and greater potential for military training. Latest habitat/stand delineation was completed in 2010 by the Salcha Soil and Water Conservation District. Stand timber typing was reconfirmed on the ground in 2009 using ground truth surveys to recalibrate late burn regeneration stands into forested or nonforested categories.

Forest Land Classification and Timber Volume Summary

The project area covers 20,737 acres of forest and non-forest lands (Table 4-21). Forestlands in the project area occupy 60% of the land area or 12,463 acres. Non-forestland amounts to 40% of the total project land area or 8,274 acres. The 1994 Hajdukovich fire burned 11,320 acres of the Gerstle River

Training Area land and was classified as non-forest with Calamagrostis, willow, and hardwood regeneration covering most of the burned area, but now after 16 years regeneration stands have begun recruitment into a non commercial forest category with over 4,117 acres. The forested lands contain 6,284 acres of commercial forestland. Commercial forestlands are those lands containing sawtimber and poletimber size classes.

The total volume by stratum is found in Table C2-10. The Gerstle River Training Area Unit has a total volume of 2,369,162 cubic feet of commercial timber. There is 1,817,993 board feet (Scribner) and over 2,369,162 tons of green biomass. Also provided is potential commercial forests acreage, identified as Timberland, where Gerstle River has 10,401 acres and of that acreage 100% is accessible (Accessible meaning not within restricted access or impact areas).

Table 4-21. Gerstle River Training Area Forest Land Classification and Timber Volume Summary

Forest Category	Total Acreage	Commercial Forest Category	Land Acreage	Percent Total Acres
Forested Lands	12,463	Commercial Forest	6,284	30.0%
		Non-Commercial Forest	6,179	30.0%
Non-Forested Lands	8,274	Shrub/Scrubland	6,510	31.0%
		Herbaceous	1,651	8.0%
		Barren	20	0.1%
		Water Bodies	93	0.4%
Total Cubic Feet	**2,369,162**	**Total Acres**	**20,737**	**100.0%**
Total Board Feet	**1,817,993**	**Total Timberland Acres**	**10,401**	**50.0%**
Total Green Tons	**2,369,162**	**Accessible Timberland Acres**	**10,401**	**100.0%***

*Percent of total Accessible Timberland Acres.

Estimated Annual Harvest

An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total existing commercial forest area by the rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The following table has softwood, hardwood, and mixed softwood/hardwood accessible harvest acreage represent saw, pole, and pole/saw timber types; the majority is in the pole/saw type.

Table 4-22. Gerstle River Training Area Estimated Accessible Annual Harvest.

Harvest Timber Type	Potential Harvest Land	Rotation Age	Regeneration Time	Total Rotation Length	Estimated Annual Harvest
Softwoods	3,348 acres	110 years	10 years	120 years	28 acres
Hardwoods	1,515 acres	70 years	10 years	80 years	19acres
Softwood/Hardwoods	1,327 acres	120 years	10 years	120 years	11 acres

4.6.4.2 Gerstle River Training Area Fauna

Moose and bison are the most visible wildlife species on Gerstle River Training Area. Gerstle River Training Area is a portion of the Delta Junction Bison Range Management Area. The Delta bison calve (April through July), primarily in the Delta River basin along terraces and gravel bars on or near Donnelly Training Area. Bison move to the Delta Bison Range during July through August when they move north of the Alaska Highway into the agricultural fields. Bison are most found on Gerstle River Training Area during winter.

Large predators include grizzly and black bears, wolves, foxes, martens, coyotes, and wolverines. These species, in addition to lynx, and snowshoe hare are found on Gerstle River Training Area.

Several point count surveys have identified a number of passerine species that are of some concern including Olive-sided Flycatcher, Rusty Blackbird, and Blackpoll Warbler.

Several small game and related species are found on Gerstle River Training Area, including including willow ptarmigan (*Lagopus lagopus*); spruce (*Falcipennis Canadensis)*, sharp-tailed (*Tympanuchus phasianellus*), and ruffed (*Bonasa umbellus*) grouse; swans; ducks; geese; and cranes. Waterfowl nest on Gerstle Training Area pothole lakes and are absent from the area during winter. There are no accurate harvest or population data for these species.

Gerstle River and its clear water tributaries support Arctic grayling.

Wood frogs (*Rana sylvatica*) are the only amphibians in the Alaska Interior, and they are found on Gerstle River Training Area. There are no reptiles.

There are no special interest management areas on Gerstle River Training Area.

4.6.5 Cultural Resources

4.6.6 Gerstle River Training Area Management Prescriptions

4.6.6.1 Military Use

There are no permanent facilities on Gerstle River Training. Except for a small off limits area, Gerstle River Training Area is a light training area. Gerstle River is reached by a gravel road off of the Alaska Highway.

4.6.6.3 Natural Resources Management

Natural resource management priority for Gerstle River Training Area is "*modified*". Fire suppression category for Gerstle River Training Area is "*limited*". Army controls vegetation management rights for Gerstle River Training Area. Gerstle River Training Area is "*open*" to hunting, trapping and fishing, except for the area immediately surrounding Blueberry Lake, which is "*closed*". Gerstle River Training Area is "*open*" for off-road recreational vehicles except for the area immediately surrounding Blueberry Lake.

Table 4-23. Gerstle River Training Area Ecosystem Management Prescriptions.

Ecosystem Management Sub-unit	Natural Resource Management Priorities	Fire Suppression Category	Vegetation Management	Hunting and Trapping	Fishing	Recreational Use Management
Training Area	Modified	Limited	Army	Open	Open	Open
Blueberry Lake	Limited	Limited	Army	Closed	Closed	Closed

Gerstle River Training Area is not an approved federal or state subsistence area. There is no subsistence preference for any subsistence user but any subsistence user may conduct approved subsistence activities after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and Executive Orders pertaining to natural resources management on Gerstle River Training Area. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of National Environmental Policy Act, Geographic Information System, and other decision support systems, and integration with other land management programs such as Sustainable Range Program and Sustainment, Restoration and Modernization Program.

4.6.6.2 Access

Public access is allowed in the Gerstle River Training Area for recreation, subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander. Public access is not allowed into the area directly surrounding Blueberry Lake.

4.6.6.3 Outdoor Recreation

Gerstle River Training Area is "*open*" to hunting, trapping and fishing, except for the area immediately surrounding Blueberry Lake, which is "*closed*". Gerstle River Training Area is "*open*" for off-road recreational vehicles except for the area immediately surrounding Blueberry Lake. GRTA is open to off-road recreational vehicles. Vehicles over 1500 lbs GVWR must stay on improved roads. No restrictions for off-road recreational vehicles with a GVWR of 1500 lbs or less unless there is a potential for damage to the surface soil layer. Any activity that creates ruts, subsidence, or erosion is prohibited. The closed use area includes all areas within 100 Meters of all structures and permanently closed off-limit areas. Figure 4-11 shows the recreation use areas on Gerstle River Training Area.

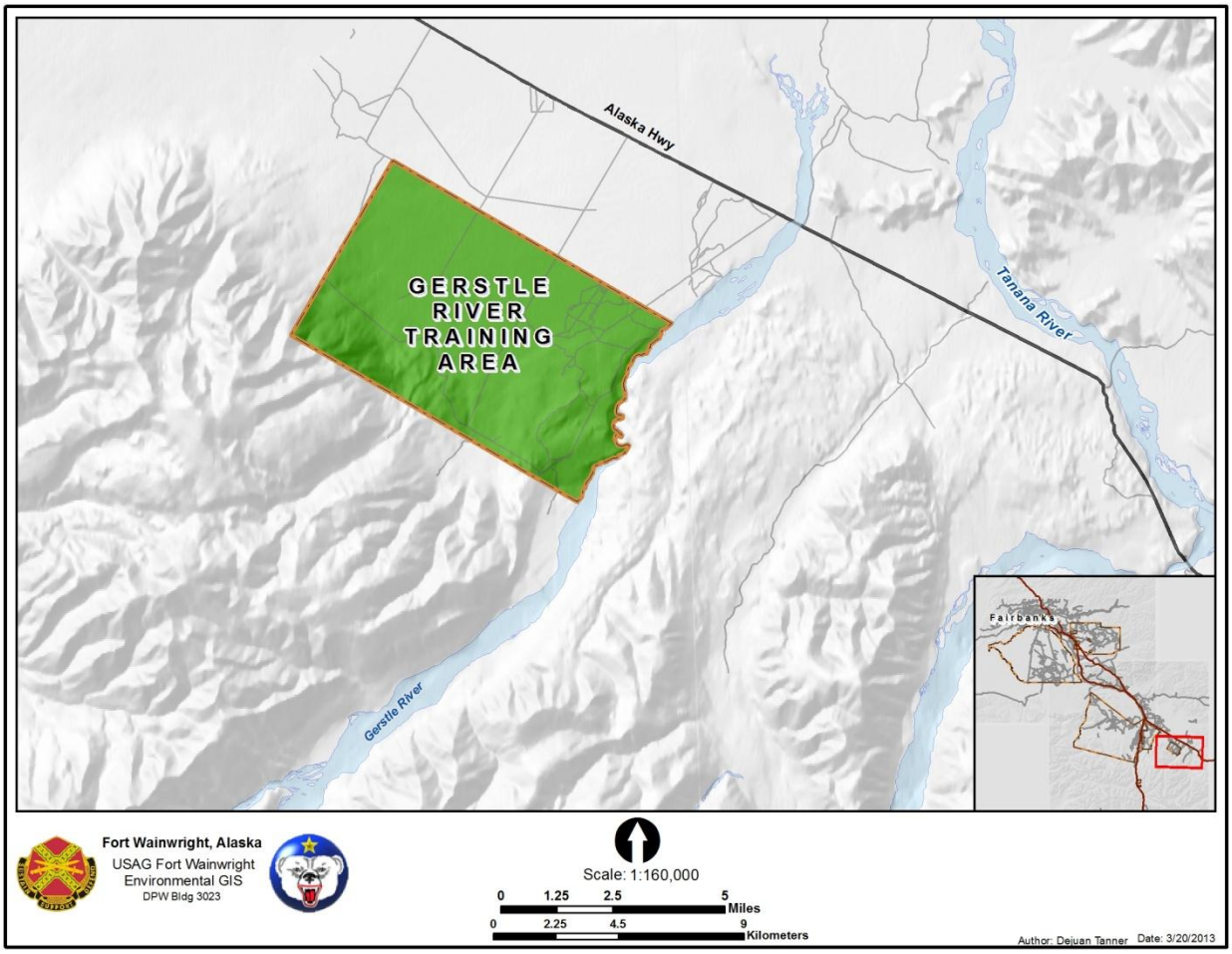


Figure 4-11. Gerstle River Training Area Recreation Use Areas.

4.6.7 Gerstle River Projects

Example ecosystem management projects for Gerstle River Training Area are shown in Appendix A, Table AC-6.

4.7 Black Rapids and Whistler Creek Training Area Ecological Management Unit

4.7.1 Location

The Black Rapids Training Area and Whistler Creek Training Area are southeast of Fort Greely and Donnelly Training Area along the east side of the Richardson Highway. Black Rapids and Whistler Creek Training Areas are shown in Figure 4-12.

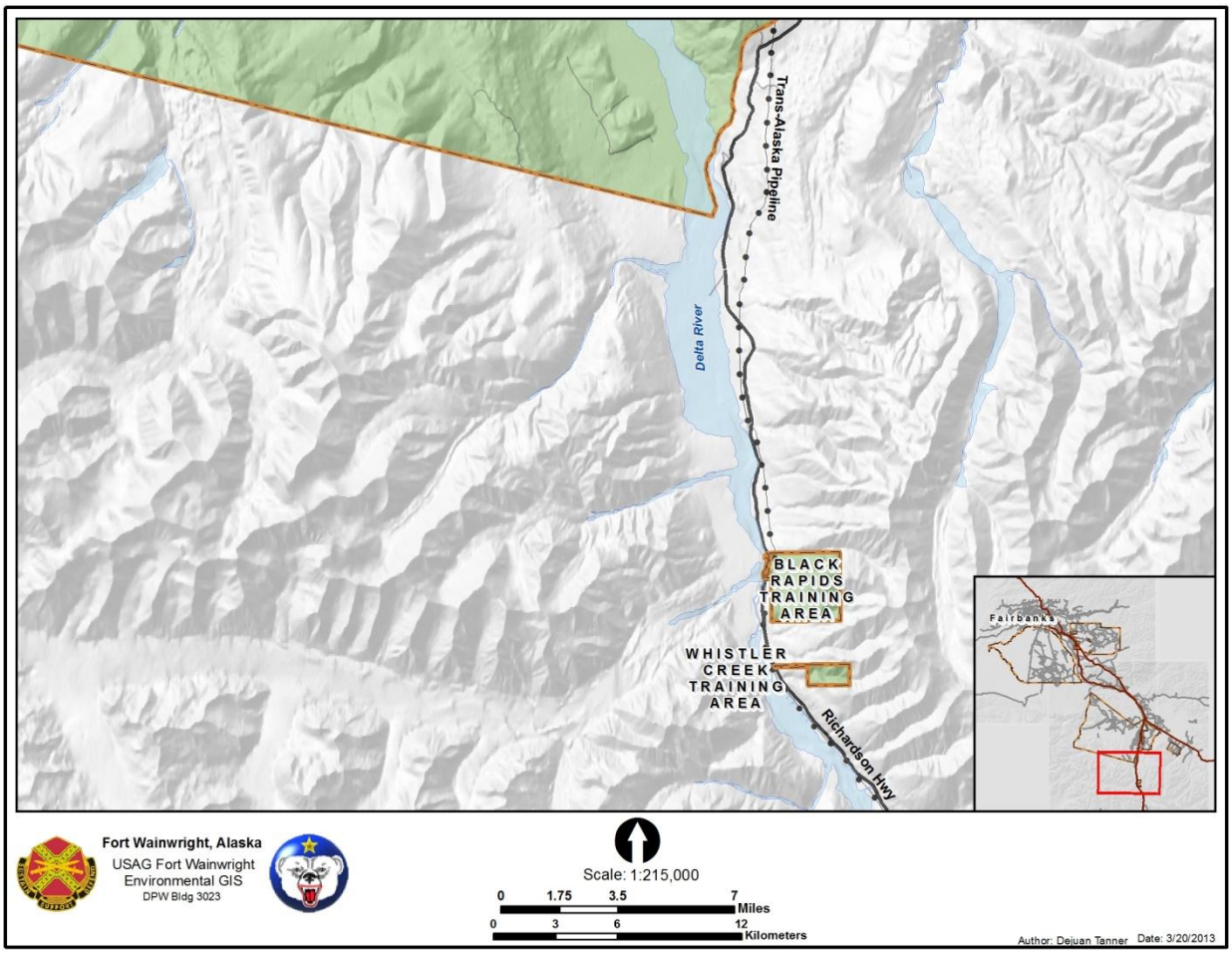


Figure 4-12. Black Rapids Training Area.

4.7.2 Black Rapids Training Area Facilities

A training facility and office complex was built to house the Northern Warfare Training Center in the 1990s and is also supported by equipment maintenance facilities and storage buildings. A ski hill, rope tow, chalet, and warming shelter are located on the slopes above the support facilities, A rock climbing instruction area and rope bridging operations facilities are also available at Black Rapids Training Area. The area is used predominantly in winter by infantry to conduct skiing, climbing and cold weather rescue and survival training.

4.7.3 Physical Resources

Black Rapids Training Area totals 2,879 acres and was permanently withdrawn under Public Land Order 2622. Whistler Creek Training Area totals 464 acres and were permanently withdrawn by Public Land Order 794 in 1958 and Public Land Order 1804 in 1959.

4.7.4 Biological Resources

4.7.4.1 Flora

Vegetation types of interior Alaska form a mosaic and reflect fire history, slope and aspect, and presence or absence of permafrost (Viereck and Little 1972). Black Rapids Training Area has four recognized cover types: open, low growing spruce forests, closed, spruce-hardwood forests, high brush transitional zone, low brush, and dwarf scrub tundra (alpine and moist).

4.7.4.1.1 Vegetative Profile

The small landscape surrounding Black Rapids Training Area covers a small array of physiographic settings. Patterns of vegetation at Black Rapids Training Area are determined by uniformed natural influences, including climate, topography (slope of 28%, a Western aspect, and elevation from 2,050 to 5,300 feet above sea level), flooding/eroding, and most importantly, permafrost. Wetlands occur at various altitudes and sometimes only during early vegetation successional stages. Local conditions often result in combinations or the absence of a vegetation type when moving up or downslope.

The vegetation profile for Black Rapids includes: barren areas (rock, gravel, snow, and/or ice), alpine/moist dwarf scrub tundra, forests (white spruce, Balsam poplar, and mixed), tall shrubs, short shrubs, barren, and water (USARAK 1979; Bonito 1980). This vegetation profile does not precisely match Viereck and Little's (1972) vegetation types, which were assessed on a statewide basis, but does match up with the Alaskan Vegetation Classification (Viereck, 1992).

4.7.4.1.2 Threatened or Endangered, and Species of Concern Plants

The Black Rapids Ecological Management Unit has no species of concern, threatened or endangered. Refer to Table 4-16 for the list of 15 species that occur on the Donnelly Training Area. Unlike Donnelly, Black Rapids Training Area has not undergone significant survey sampling to conclude that species of concern listed under the Alaska Natural Heritage Program is similar to Donnelly's list.

4.7.4.1.3 Floristic Inventory

A floristic inventory of Donnelly Training Area was conducted by ABR and others in 1998 (Racine, 2001). It did not cover Black Rapids Training Area. This area since been has been found to host a few species not known on Donnelly Training Area. The original 83 plant species was a combination of records collected from JDM and RTLA observations done in 2002. In 2010 a ground truth survey was performed where 395 plots were sampled and in 2011 JDM and RTLA made trips to botanize Black Rapids resulting in a new list of 176 species including two rare plants: *Stellaria alaskana* and *Lupinus kuschei*.

4.7.4.1.4 Ecological Land Classification

U.S. Army Cold Regions Research and Engineering Laboratory (Cold Regions Research Engineering Laboratory) contracted ABR, Environmental Research and Services, Inc., to produce ecological land classification maps for Donnelly Training Area. The Black Rapids Ecological Management Unit was not included in this map and final report. The Ecological Land Classification is a hierarchical means to classify land according to various ecological scales. In 2008-2010 a ground truth survey was implemented

to provide accurate data for land cover types, over 395 points were sampled. The ecological land classification mapping for Black Rapids was completed and added to an updated map. Black Rapids Training Area is located in the Hayes Mountains ecodistrict.

4.7.4.1.6Forest Resources

A forest inventory is an integral part in establishing a plan for managing forest resources. The Black Rapids Training Area Ecological Management Unit was inventoried by Directorate of Public Works Environmental Forestry Staff during the 2003 field season. Tree data was collected from permanent plots as part of an ongoing Forest Inventory and Analysis of Fort Wainwright lands.

Stand Delineation and Inventory

Stand timber types were delineated utilizing aerial photography to produce maps that demarcate land into forested and non-forested categories. This process was also used to help identify geographical coordinates for the plots and to establish permanent plots on the ground. Stand timber typing was confirmed on the ground during stand inventory back in 2003. The fixed plot radius sampling method was used for tree data collection. These stand types are predefined by the *Alaska Vegetation Classification system* (Viereck et al. 1992). The Fort Wainwright inventory method further stratifies out stands with higher timber value, size class, stocking, greater ecological importance, and greater potential for military training. Latest habitat/stand delineation was completed in 2010 by the Salcha Soil and Water Conservation District. Stand timber typing was reconfirmed on the ground in 2009 using habitat surveys.

Forest Land Classification and Timber Volume Summary

The Black Rapids Ecological Management Unit (Including Whistler Creek TA) contains approximately 3,373 acres of forested and non-forested lands (Table 4-24). Forestlands in the project area occupy 14% of the land area or 469 acres. Non-forestland amounts to 86 % of the total project land area or 2,904 acres. The forested lands contain 345 acres of commercial forestland. Commercial forestlands are those lands containing sawtimber and poletimber size classes within an open or closed stand.

The total volume by stratum is found in Table C2-12. The Black Rapids Ecological Management Unit has a total volume of 154,568 cubic feet of commercial timber. There is 303,850 board feet (Scribner) and over 2,829 tons of green biomass. Also provided is potential commercial forests acreage, identified as Timberland, where Black Rapids has 347 acres and of that acreage 100% is accessible (Accessible meaning not within restricted access or impact areas).

Table 4-24. Black Rapids Training Area Forest Land Classification and Timber Volume Summary

Forest Category	Total Acreage	Commercial Forest Category	Land Acreage	Percent Total Acres
Forested Lands	469	Commercial Forest	345	10.2%
		Non-Commercial Forest	124	3.7%
Non-Forested Lands	2,848	Shrub/Scrubland	1,967	58.3%
		Barren-Natural	871	25.8%
		Barren-Cultural	51	1.5%
		WaterBodies	15	0.4%
Total Cubic Feet	**154,568**	**Total Acres**	**3,373**	**100.0%**

Total Board Feet	**303,850**	**Total Timberland Acres**	**347**	**10.3%**
Total Green Tons	**2,829**	**Accessible Timberland Acres**	**347**	**100.0%***

*Percent of total Accessible Timberland Acres.

Estimated Annual Harvest
An estimate of the annual allowable harvest is a guide for future harvest activities. Calculations are based on the simple area cut method. This method divides the total existing commercial forest area by the rotation age. The result of this method gives the acreage that can be harvested in a year. The acreage is multiplied by the weighted average volume per acre to determine the annual harvest. The following softwood, hardwood, and mixed softwood/hardwood accessible harvest acreage represent saw, pole, and pole/saw timber types; the majority is in the pole type.

Table 4-25. Black Rapids Training Area Estimated Accessible Annual Harvest.

Harvest Timber Type	Potential Harvest Land	Rotation Age	Regeneration Time	Total Rotation Length	Estimated Annual Harvest
Softwoods	276 acres	110 years	10 years	120 years	2.3 acres
Hardwoods	8.4 acres	80 years	10 years	90 years	0.1 acres
Softwood/Hardwoods	60 acres	110 years	10 years	120 years	0.5 acres

4.7.4.2 Black Rapids Training Area Fauna

4.7.4.2.1 Dall Sheep
Dall sheep (*Ovis dalli*) are found on both Black Rapids and Whistler Creek Trainings Areas. Increased levels of Army training are occurring at these training areas and are expected to remain higher than historic levels. Impacts to sheep are unknown. Dall sheep are susceptible to impacts from human disturbance, particularly during lambing, which can lower survival rates of lambs. Dall Sheep are known to use BRTA and WCTA but there is no data to determine the importance of Army land to sheep. Roadside surveys began in 2009. Population size is unknown however surveys have shown that sheep are present during the entire survey period of April-October. Both ewe/lamb and ram groups have been observed. Due to the small size of these training areas, this population of sheep moves on and off of military lands regularly.

In 2013 a dedicated sheep study will begin on military lands that will determine sheep abundance, habitat use, and compare road-side surveys to aerial surveys.

There is currently no clear guidance about army activities in sheep habitat however the following guidelines are recommended from other NEPA actions. The Stationing and Training of Increased Aviation Assets within US Army Alaska EIS states in 4.6.2.2.4 (p 86) that higher altitudes (500 feet minimum) of helicopters in the flight corridors would minimize disturbance to any Dall sheep, which is sensitive to helicopter overflights at low altitudes. In section 4.6.2.3.4 (p 95) it also states that: Disturbance of Dall sheep could occur along the flight corridor between FRA and DTA where the corridor passes over Dall sheep habitats in the Alaska Range, particularly north of Isabel Pass. The helicopter altitude limitations in the flight corridor should mitigate much of the possible impacts (behavioral disturbance or displacement), as well as the restriction of helicopters to the airspace directly above the Richardson Hwy, thus avoiding Dall sheep habitats. In section 4.12.4.5 (p 168) it states that: Although Dall sheep are less affected by the high-altitude training of C-21s and F22s, the USAF has

overflight restrictions over Dall sheep lambing, wintering, and rutting areas beneath airspace that would protect Dall sheep.

The AK MOA EIS ROD 1997 says in 4.3.5: The Air Force will establish a minimum overflight altitude of 5,000 feet AGL over the Northern Alaska Range and Tanana Hill Dall sheep lambing areas and spring mineral licks as necessary between May 15 and June 15 and rutting area as necessary between November 15 and December 15 to reduce noise levels and the potential for negative behavioral responses during these critical lifecycle periods.

The Alaska Army Lands Withdrawal Renewal EIS discusses sheep and training in 4.12 (p 46-7). It states that recommendation from a study by Spiers and Heimer identified that vehicular traffic should be excluded from elevations above 3500 feet in the mountains between Buchanan Creek and Delta Creek to preclude destruction of alpine habitat. The second recommendation was that large ground exercises spread over a large area should not occur in sheep range. Small numbers of troop could train in sheep range if they stayed in an area 1 square mile.

4.7.4.2.2 Other Mammals

Mammals seen on Black Rapids and Whistler Creek Training Areas include grizzly and black bears, wolves, red foxes, American marten, coyotes, wolverines, pika and Canada lynx.

4.7.4.2.3 Birds

Only causal bird surveys have been conducted one these training areas however species documented that are of concern include White-tailed Ptarmigan, Peregrine Falcon, and Blackpoll Warbler.

4.7.4.2.4 Special Status Fauna

A Golden Eagle nesting territory was identified just outside of the northern boundary of Black Rapids Training Area. In 2012 it appeared inactive, however adult eagles were seen in the immediate area repeatedly over the breeding season. The nest is protected under BGEPA and requires revisiting to determine occupancy for future activities or projects.

4.7.5 Cultural Resources

4.7.6 Black Rapids Training Area Management Prescriptions

4.7.6.1 Military Use

Black Rapids Training Area and Whistler Creek Rock Climbing Area are used exclusively by the Northern Warfare Training Center for mountain and winter training. There is no live fire training on Black Rapids Training Area or Whistler Creek Rock Climbing Area.

4.7.6.2 Natural Resources Management

Natural resource management priority for Black Rapids Training Area is "*full*". Fire suppression category for Black Rapids is "*modified*". The Army retains vegetation management rights to both Black Rapids and Whistler Creek. Black Rapids is "*closed*" to hunting, trapping, fishing. Black Rapids is "*closed*" to off-road recreational vehicle use. Natural Resource management priority for Whistler Creek is "*modified*" and fire suppression category is "*limited*". Hunting, trapping and fishing is "*open*" in Whistler Creek and is also "*open*" for off-road recreational vehicles.

Table 4-26. Black Rapids and Whistler Creek Training Area Ecosystem Management Prescriptions.

Ecosystem Management Sub-unit	Natural Resource Management Priorities	Fire Suppression Category	Vegetation Management	Hunting and Trapping	Fishing	Recreational Use Management
Black Rapids Training Area	Full	Modified	Army	Closed	Closed	Closed
Whistler Creek Training Area	Moderate	Limited	Army	Open	Open	Open

Black Rapids Training Area and Whistler Creek Rock Climbing Area are not approved federal or state subsistence areas. There is no subsistence preference for any subsistence user but any subsistence user may conduct approved subsistence activities in the Whistler Creek Rock Climbing Area after acquiring any required state licenses, Fort Wainwright recreation access permit, and checking in with USARTRAK.

Fort Wainwright will comply with all laws, regulations, and Executive Orders pertaining to natural resources management on Black Rapids Training Area. Fort Wainwright will complete ongoing projects and conduct full implementation of ecosystem management projects. Fort Wainwright will conserve physical resources by conducting Integrated Training Area Management, watershed management, and minerals management. Fort Wainwright will conserve biological resources by conducting wetland management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. Fort Wainwright will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. Fort Wainwright will support ecosystem management decision-making through implementation of National Environmental Policy Act, Geographic Information System, and other decision support systems, and integration with other land management programs such as Sustainable Range Program and Sustainment, Restoration and Modernization Program.

4.7.6.3 Access

There is no public access to Black Rapids Training Area. Public access is allowed in the Whistler Creek Rock Climbing Area for recreation, subject to safety restrictions and military security, when access does not impair the military mission, as determined by the installation commander.

4.7.6.4 Outdoor Recreation

Black Rapids Training Area is closed to all off-road recreational vehicles use but open for other forms of recreation including hunting. Recreational access onto Black Rapids Training Area is gained through the USARTRAK system. Whistler Creek Training Area is closed to all off-road recreational vehicles use but open for other forms of recreation including hunting. The closed use area includes all areas within 100 meters of all structures and permanently closed off-limit areas. Figure 4-13 shows the recreation use areas on Whistler Creek Rock Climbing Area.

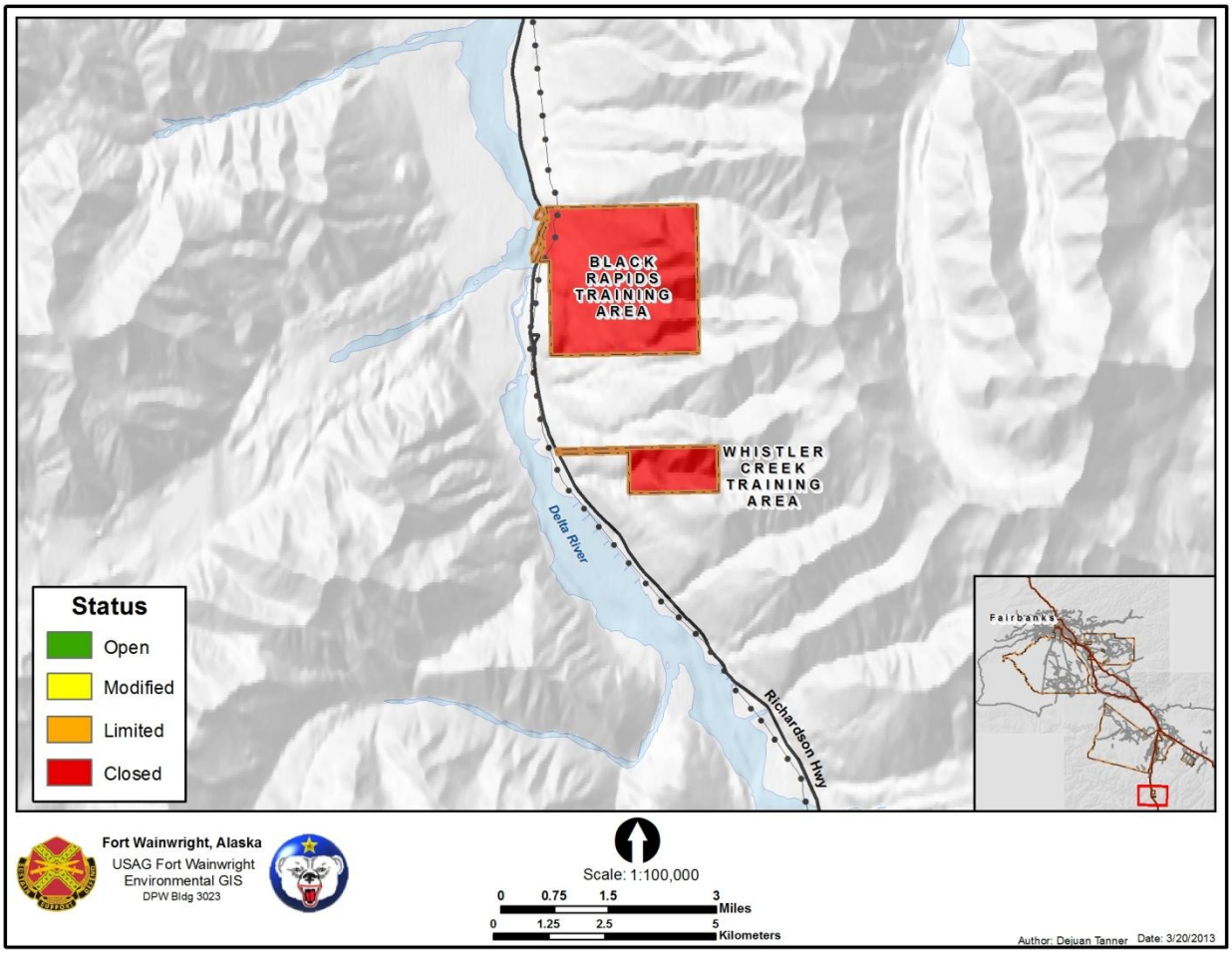


Figure 4-13. Black Rapids Training Area and Whistler Creek Recreation Use Areas.

4.7.7 Black Rapids Training Area Projects

Example ecosystem management projects for Black Rapids Training Area are shown in Appendix A, Table AC-7.

4.8 Natural Resources Program Implementation

Natural resources program management includes all the tasks required to plan, organize, and implement, and operate the natural resources program for Fort Wainwright. Goals for natural resources program management are found below:

- Prepare, update, and submit Conservation "must fund" projects on time annually.
- Develop, update, and execute Conservation work plan annually.
- Obtain and execute 100% of natural resource funding annually.
- Contribute to Installation Status Report and Army Environmental Database - Environmental Quality report on time annually.
- Execute conservation implementation plan.
- Maintain designated natural resources professionals with appropriate training.
- Recruit and train adequate staff to conduct natural resources.

- Prepare, update, and execute cooperative agreements, Memoranda of Understanding, and Memoranda of Agreement to accomplish natural resources management.

4.8.1 Integrated Natural Resource Management Plan

Natural resource planning includes preparing, updating, implementing, and reviewing the INRMP annually. Natural resources management is also part of the conservation program. The conservation program in Fort Wainwright is guided by the Fort Wainwright conservation implementation plan. Detailed planning guidelines can be found in Volume II, Annex A.

4.8.2 Reporting

Fort Wainwright is responsible for submitting reports for funding requirements, funding work plans, and environmental quality status. Fort Wainwright must annually submit the Army Environmental Database – Environmental Quality, the Installation Status Report Part II Environmental, and Reimbursable Project Tracking System. The Environmental Program Requirements report, the basis for reporting environmental funding requirements, was discontinued in 2005.

4.8.3 Cooperative Agreements

A priority for partnering and accomplishing work to implement this plan is through cooperative agreements. Army Regulation 200-1 directs that, where applicable, an installation should enter into cooperative plans, in accordance with 16 USC 670a, with state and federal conservation agencies for the conservation and development of fish and wildlife, soil, outdoor recreation, and other resources.

4.8.3.1 Fish and Wildlife Cooperative Plan

In accordance with 16 USC 670a, the Fish and Wildlife Cooperative Plan is that component of the INRMP that describes how the fish and wildlife resources at an installation will be managed. It is a tripartite agreement between the Fort Wainwright, USFWS and the ADFG. The cooperative plan provides a program of planning for, and the development, maintenance, and coordination of wildlife, fish, and game conservation. Signature by the three agencies on the INRMP enacts the fish and wildlife cooperative plan. A summary of items agreed to by the three agencies is consolidated in Appendix AA.1

4.8.3.2 Department of Defense Agreements

Memoranda of Understanding between the Department of Defense and other resources agencies provide the authority for installations to develop their own cooperative agreements in attainment of mutual conservation objectives with these agencies.

Memoranda of Understanding have been established between the Department of Defense and the Departments of Agriculture (March 27, 1963) and Interior (April 7, 1978). The memoranda authorize execution of cooperative agreements in attainment of mutual conservation objectives. Installations may develop cooperative agreements with the following:

- Department of Agriculture functioning through the Agriculture Research Service, the Soil Conservation Service, and the Forest Service.

- The Department of the Interior functioning through the USFWS for the conservation of fish and wildlife resources and through the National Park Service for the development and management of outdoor recreation activities.
- The Department of Agriculture functioning through the Animal and Plant Health Inspection Service and Animal Damage Control for animal damage control on military installations.

A cooperative agreement between the Department of Defense and The Nature Conservancy (December 13, 1988) declared a policy of cooperation and establishes procedures for planning and conducting cooperative efforts between The Nature Conservancy and Department of Defense on Department of Defense lands. Under this agreement, installation commanders can obtain technical assistance from The Nature Conservancy and State Heritage Programs, as well as allowing The Nature Conservancy to study significant ecosystems under the Army's control.

In June 1999, the heads of participating federal agencies signed a Memorandum of Understanding establishing the Cooperative Ecosystem Studies Unit Network. Department of Defense joined the network in September 2000 and now serves as a council member and technical advisor on one of the Cooperative Ecosystem Studies Units. Cooperative Ecosystem Studies Units (CESU) provide research, technical assistance, and education to federal land management, environmental, and research agencies, and their partners. The CESU Network has several benefits: a broadened scope of scientific services for federal agencies, increased technical assistance to resource managers, additional scientific resources and opportunities for universities, and increased diversity of research scientists and institutions.

4.8.3.3 Other Fort Wainwright Agreements

Fort Wainwright has developed the following cooperative agreements to implement this plan and the conservation program.

- *Memorandum of Understanding between the BLM and the United States Army Alaska concerning the management of certain public lands withdrawn for military use.* This Memorandum of Understanding, developed and entered into by the BLM's Alaska State Office and the United States Army Alaska established cooperative efforts for the management of public lands withdrawn for military use in accordance with the Military Lands Withdrawal Act of 1986 (public Law 99-606). It implements the Fort Greely Resource Management Plan and the Fort Wainwright Yukon Maneuver Area Resource Management Plan.
- *Cooperative Agreement between Alaska District Corps of Engineers and BLM, Alaska.* This agreement between the Department of the Army, Alaska District, Corps of Engineers and the Department of the Interior, BLM, Alaska State Office (BLM) defines the responsibilities for authorizing use (rights-of-way, leases, licenses, permits) by others of public lands in Alaska withdrawn for the Department of the Army and the Department of the Air Force.
- *Memorandum of Agreement for Fire Suppression on Army Lands in Alaska.* The Army has an agreement with BLM, Alaska Fire Service whereby the Alaska Fire Service is provided facilities on Fort Wainwright in exchange for fire protection on all Army lands in Alaska.
- *Cooperative Agreement for Natural and Cultural Resource Support.* This agreement between Fort Wainwright and the University of Alaska provides natural and cultural resource support.
- *Cooperative Agreement for Natural, Cultural, and Environmental Support*. This agreement with the Center for Environmental Management of Military Lands at Colorado State University provides support for natural and cultural resources, as well as environmental management.

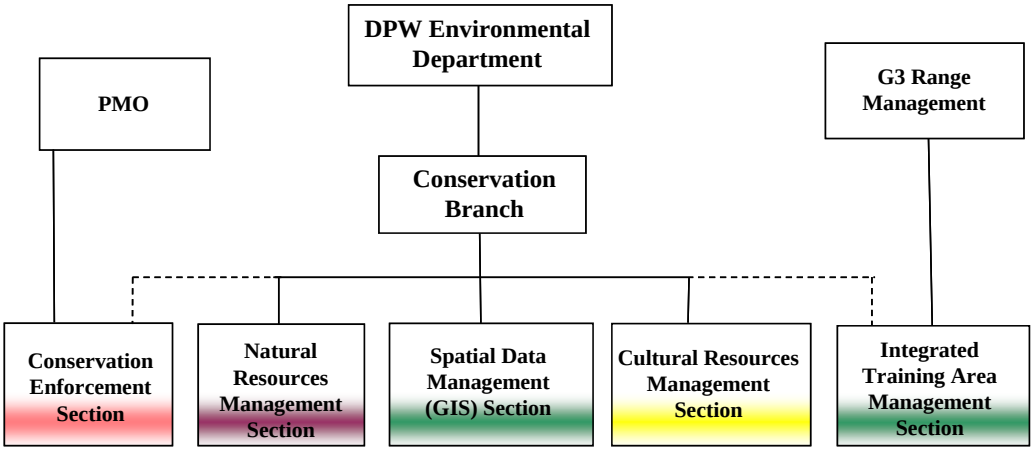
- *Cooperative Agreement for Erosion Control and Habitat Management.* Fort Wainwright has entered into cooperative agreements with both the Salcha-Delta Soil and Water Conservation District (DSWCD) and the Palmer Soil and Water Conservation District (PSWCD) for enhancing, rehabilitating, and maintaining Fort Wainwright training lands to ensure their continued long-term use and effectiveness. The districts partner with Fort Wainwright to conduct land rehabilitation and maintenance, erosion control, and habitat management projects.

4.8.4 Organizational Enhancement, Roles, and Responsibilities

4.8.4.1 Organization

The Conservation Branch is a sub-component of the Fort Wainwright's Environmental Resources Department. Other branches within Environmental Resources Department include Planning Branch, Compliance Branch, and Clean-up Branch. The Natural Resources Section is a part of Conservation Branch. The Conservation Enforcement Section reports directly to the Director of Emergency Services, while the Integrated Training Area Management Section reports directly to the USARAK G-3, Training Support Services' Installation Range Office. Both of these sections are integrated in terms of personnel and implementation of projects with Conservation Branch.

Figure 4-14. Conservation Branch Organizational Chart.



4.8.4.2 Staffing

The management and conservation of natural resources under Army stewardship is an inherently governmental function. Therefore, the provisions of Army Regulation 5-20 (commercial activities program) do not apply to the planning, implementation, enforcement, or management of Army natural resources management programs. This includes all positions (for example, professional, technical, equipment operators, natural resources law enforcement professionals, laborers, and so on) that have been validated as a requirement to perform natural resources management. However, support to the natural resources program, where it is severable from management, planning, implementation or enforcement actions of natural resources, may be subject to the provisions of Army Regulation 5-20. Personnel positions associated with activities that support (on an as-needed basis), the natural resources program (for example, equipment operators or laborers from a pool or another shop) may be subject to the provisions of Army Regulation 5-20.

The ideal situation would be for all positions to be full-time, permanent federal positions. Considering current Army personnel policies, the addition of permanent full-time federal positions is not likely in the foreseeable future. A blended workforce appears to be a necessity. Fort Wainwright is also directed by Army Regulation 200-1 to seek technical assistance from appropriate natural resources agencies (federal, state, and local). Fort Wainwright will pursue options to fill staff positions in a manner that will accomplish the most efficient blended workforce as possible.

Since the natural resources disciplines encompassed within this INRMP are the natural sciences, Fort Wainwright is mandated by Army Regulation 200-1 to establish the optimum staffing of natural resources management professionals, appropriate to the resources, to ensure necessary technical guidance in the planning and execution of the natural resources program. Fort Wainwright will establish positions as needed and fill validated positions in accordance with current Department of Defense/Department of Army policy. Positions required to meet Sikes Act requirements for implementation of this INRMP are shown below in Table 4-27.

Table 4-27. Fort Wainwright positions required to implement the INRMP.

Location	POSITION TITLE	Area of Responsibility	Organization	CLASSIFICATION
FWA	Conservation Branch Chief	Fort Wainwright	DPW Environmental	Federal GS-13
FWA	Natural Resources Chief	Fort Wainwright	DPW Environmental	Federal GS-12
FWA	Forester	Fort Wainwright	DPW Environmental	IPA
FWA	Forest Technician	Fort Wainwright	DPW Environmental	University Support
FWA	Forest Technician	Fort Wainwright	DPW Environmental	University Support
FWA	Natural Resources Recreation Specialist	FWA / DTA	DPW Environmental	University Support
FWA	Wetlands Scientist	FWA / DTA	DPW Environmental	University Support
FWA	Wetlands Ecologist	FWA / DTA	DPW Environmental	University Support
FWA	Fish and Wildlife Biologist	FWA / DTA	DPW Environmental	University Support
DTA	Natural Resources Coordinator	DTA	DPW Environmental	University Support
DTA	Wildlife Biologist	DTA	DPW Environmental	University Support

FWA	Geographic Information System Coordinator	FWA / DT	DPW Environmental	IPA
JBER	Geographic Information System Coordinator ITAM	FWA / DTA / RTA	G3 Integrated Training Area Management	University Support
FWA	Cultural Resources Manager	FWA / DTA	DPW Environmental	GS-12
FWA	Archaeologist	FWA / DTA	DPW Environmental	University Support
DTA	Archaeologist	DTA	DPW Environmental	University Support
FWA	Historian	FWA/DTA	DPW Environmental	University Support
FWA	FWA Integrated Training Area Management Coordinator	FWA	G3 Integrated Training Area Management	GS-12
FWA	FWA Range and Training Land Assessment Coordinator	FWA	G3 Integrated Training Area Management	University Support
DTA	DTA Integrated Training Area Management Coordinator	DTA	G3 Integrated Training Area Management	GS-12
DTA	DTA Range and Training Land Assessment Coordinator	DTA	G3 Integrated Training Area Management	University Support
RTA	RTA Integrated Training Area Management Coordinator	JBER	G3 Integrated Training Area Management	IPA
RTA	DTA Range and Training Land Assessment Coordinator	JBER	G3 Integrated Training Area Management	University Support

FWA	4 Conservation Enforcement Officers	FWA / DTA	Provost Marshal's Office	Conservation Law Enforcement GS-9/11
DTA	2 Conservation Enforcement Officers	FWA / DTA	Provost Marshal's Office	Conservation Law Enforcement GS-9/11

FWA – Fort Wainwright Alaska
DTA – Donnelly Training Area
RTA – Richardson Training Area
JBER - Joint Base Elmendorf Richardson
DPW – Directorate of Public Works
G3 Integrated Training Area Management – Assistant Chief of Staff for Training and Operations - Integrated Training Area Management
IPA – Intergovernmental Personnel Act

Full implementation of this INRMP requires full-time federal natural resource positions, as well as assistance from Fort Wainwright's partners and cooperators, both signatory and otherwise. Specific needs from organizations external to Fort Wainwright are indicated throughout this document. It is impossible for Fort Wainwright to hire the specialized expertise needed for some projects within this plan. Fort Wainwright will require considerable expertise from universities, agencies, and contractors to accomplish some tasks. Fort Wainwright will reimburse parties for much of this assistance.

Federal In-house Capabilities: Fort Wainwright has limited in-house federal positions as a result of manpower restrictions. To meet the intent of the Sikes Act, an additional eight federal positions are required for the planning, management, and enforcement of natural resources. Six of those positions could be filled by military game wardens.

Federal Agency Support: Fort Wainwright could utilize personnel support from other federal agencies; however, this option has not been used previously and is not anticipated to be used during 2007-2011. These types of personnel meet Sikes Act requirements for "Government in Nature" positions for planning, management, and enforcement of natural resources.

State Agency Support*:* The Intergovernmental Personnel Act of 1972 (IPA) is a means to obtain personnel support. The IPA is a system where a federal or state agency "borrows" other federal or state agency personnel for a limited time to do a specific job. Any state or federal agency is authorized to participate. The installation pays the borrowed employee's salary and administrative overhead. Major advantages are that personnel are not considered contractors, can represent and obligate the federal government, and manpower authorizations are not required. IPA employees are considered part of the Fort Wainwright staff and can be directly supervised by federal employees. IPA employees are bound by ethics rules of both their home state agency as well as federal ethics regulations. These types of personnel meet Sikes Act requirements for "government in nature" positions for planning, management, and enforcement of natural resources.

Another "borrowed personnel" option for securing manpower assistance is through the Oak Ridge Institute for Science and Education. Oak Ridge Associated Universities manages and operates the Oak Ridge Institute for Science and Education research participation program for the U.S. Department of Energy. Oak Ridge Institute for Science and Education is a consortium of 88 doctoral-granting colleges and universities, providing students and post graduates opportunities to gain experience in their respective fields by working on Army installations. Oak Ridge Institute for Science and Education program

coordinators at the Army Environmental Center are points of contact for the program. Oak Ridge Institute for Science and Education personnel are appointed research participants who will gain hands-on experience by completing multiple tasks for the duration of their employment. Stipends are equivalent to salaries for employees hired with similar educational backgrounds, with a 30% overhead added. Oak Ridge Institute for Science and Education personnel can be appointed for a maximum three-year term. Installations may assist in the selection of Oak Ridge Institute for Science and Education personnel. These personnel support positions are not considered "government in nature."

University Assistance. Support to the natural resources program, where it is severable from management, planning, implementation or enforcement actions of natural resources, may be provided by on-site contract personnel. Due to the Sikes Act preference for other federal and state agencies with natural resource expertise, state universities receive first preference for providing on-site natural resources contract personnel support. Fort Wainwright has used several universities in recent years to help with specialized needs. University of Alaska has provided research support to Fort Wainwright. The primary source of on-site university personnel assistance has been Colorado State University to help implement the Fort Wainwright Conservation and Integrated Training Area Management programs. These on-site support positions are not considered "government in nature."

Contractor Support. As a final option for manpower assistance, Fort Wainwright may turn to outside contractors for tasks that are severable from management, planning, implementation or enforcement actions of natural resources. Contractors give Fort Wainwright access to a wide variety of expertise. Contractors may be used for projects such as plan preparation, National Environmental Policy Act documentation, aerial census and photography, Land Rehabilitation and Maintenance implementation, and similar activities.

4.8.5 Coordination and Training

Staff coordination and communication can be challenging as the conservation staff is spread out over three locations hundreds of miles apart. A significant strength of the conservation program is the integration with other Army directorates, namely the Provost Marshal's Office and the USARAK G-3, this split chain of command also makes communication and coordination very difficult. On-the-job training is often difficult because some supervisors work in different locations from their staff. A blended workforce consisting of federal employees, Intergovernmental Personnel Agreement staff, university personnel, and contract personnel also contributes to chain of command challenges. Therefore, Fort Wainwright has instituted a framework of natural resource teams, in-progress reviews, and periodic training to meet these challenges.

4.8.5.1 In-Progress Review

The Fort Wainwright Conservation/Integrated Training Area Management In-Progress Review process is the forum by which conservation personnel report annual accomplishments and brief future plans and requirements to the Fort Wainwright Environmental Chief, USARAK Range Manager and Range Officers from each post. The In-Progress Review provides an opportunity for discussion between the conservation personnel from each post and the Fort Wainwright range and environmental staff. Installation Management Command Pacific Area Regional Office Conservation and U.S. Army Pacific Command Integrated Training Area Management personnel are invited to participate.

4.8.5.2 Training

Interdisciplinary training is essential for Department of Defense natural resource managers. It addresses practical job disciplines, statutory compliance requirements, applicable Department of

Defense/Department of Army regulations, pertinent state and local laws, and current scientific and professional standards as related to the conservation of our nation's natural resources. The natural resource training objective is to identify technical requirements as well as the resources (cooperative agreements, Legacy, Integrated Training Area Management, Memoranda of Understanding, and so forth) available to implement and execute a successful and proactive program, the goal being to maintain and enhance the military mission, biodiversity, conservation stewardship, and the management of the total ecosystem from the practical standpoint of day-to-day operations as well as long-term planning.

4.8.6 Decision Support

Decision support system goals and objectives all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. Decision support system goals and objectives are:

- Provide a decision support capability to natural resources, range, and engineer planners and managers.
- Develop and maintain Fort Wainwright Geographic Information System spatial database and data layers.
- Maintain Geographic Information System data in accordance with Federal Geographic Data Committee standards and Tri-Services Spatial Data Standards, including metadata standards.
- Coordinate and synchronize the three decision support systems.

There are three management components of the decision support systems used in Fort Wainwright. These three components are Geographic Information System, Range Facility Management Support System, and Integrated Facility System. More information on decision support programs can be found in Appendix A.

4.8.6.1 Geographic Information Systems

The Fort Wainwright Geographic Information System is a foundational capability of natural resource management. The Geographic Information System is a computer-based tool capable of assembling, storing, manipulating, and displaying geographically referenced information, (i.e., data identified according to their locations). The system can be used to analyze and model (manipulate, overlay, measure, compute, and retrieve) the digital spatial data and display the new map products and tabular resources information showing the results of the spatial analysis. Geographic information System technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps. These abilities distinguish Geographic Information System from other information systems.

4.8.6.2 Range Facilities Management Support System

The Range Facilities Management Support System is a multi-user, personal computer, web-based software package that automates the real property inventory, scheduling, firing (operations) desk, and management functions at an installation Range Control Center. The Range Facilities Management Support System was developed to optimize the scheduling, use, and operations and maintenance functions for an installation's live-fire ranges, maneuver training areas, and other related training facilities and assets under Army Regulation 210-21.

4.8.7 Outreach

Outreach is another extremely foundational component of natural resources implementation. Each natural resource program area conducts outreach activities, and the natural resources program management function integrates those efforts through the conservation web page, conservation newsletter, and participates in other outreach events.

4.8.8 Financial Management

Another significant component of Fort Wainwright natural resource program management is financial management. Financial management consists of funding, budgeting, and contracting. These three components all are extremely important to Fort Wainwright's ability to implement this plan.

4.8.8.1 Funding

The intent of the funding section of this INRMP is to link resources with the goals established. The funding section of this plan will therefore be used to develop and support environmental funding requirements.

4.8.8.1.1 Environmental Program Funding

Environmental funds are a special category of the Army's budget. Until 2005, the Environmental Program Requirements process governed environmental funding. They were special in that they were fenced by Department of Defense, but they are still subject to restrictions of operation and maintenance funds. "Must fund" classifications included mitigation identified within Findings of No Significant Impact, items required within Federal Facilities Compliance Agreements, and planning level surveys. This INRMP is a Federal Facilities Requirement Agreement that contains projects and programs to mitigate various military activities. Currently, the Environmental Program Requirements system has been replaced by the Environmental Cost Standardization model to implement the Army Strategy for the Environment. The Environmental Cost Standardization uses a cost model to develop installation environmental requirements that are predictable. A great deal of confusion exists concerning environmental funding of new or unpredictable requirements, or how installations will communicate new or adjusted requirements to Army headquarters.

The purpose of environmental conservation funding is to enable the Army mission by funding characterization, monitoring, compliance and continuing oversight of installation natural and cultural resources. Conservation funding allows Army managers to exercise stewardship of natural and cultural resources by facilitation of the planned management of natural and cultural resources, via the Integrated Natural Resources Management Plan and Integrated Cultural Resource Management Plan. This is accomplished in coordination with facility managers, trainers and other land users, through funding and implementation of projects that help preserve, maintain, repair and improve natural and cultural resources for sustaining mission requirements. Appendix A lists environmental conservation funding requirements needed to implement this INRMP.

The purpose of environmental compliance funding is to enable the Army mission by funding implementation of legally mandated actions to protect and enhance environmental media from the negative effects of pollution and human alteration and allow sustained access to and use of operational ranges to meet doctrinal training requirements. While most of these funding requirements are not covered here in this INRMP, there are a few compliance funded projects that are intertwined with natural resources management. These compliance funded projects are listed in Appendix A.

4.8.8.1.2 Conservation Reimbursable Funding

Reimbursable programs support military readiness and land management, and revenues from these programs supplement base operations and other funding. Agriculture/grazing outleases are authorized by

10 USC 2667(d), and commercial forestry by 10 USC 2665. Reimbursable programs may be used to enhance and maintain wildlife habitats. The Army has about 800,000 acres of land leased under agriculture/grazing, and 1.4 million acres under some form of commercial forestry. The Army also has executive agent responsibilities over the Department of Defense Forestry Reserve Account.

Forestry funds are generated from sale of forest products on military lands and are centrally controlled by the Department of the Army. Fort Wainwright may be reimbursed for all costs associated with the maintenance and disposition of forest products. Forestry funds must be used only for projects directly related to forest ecosystem management. Such projects include timber management, reforestation, timber stand improvement, inventories, fire protection, construction and maintenance of timber area access roads, purchase of forestry equipment, disease and insect control, planning (including compliance with laws), marking, inspections, sales preparations, personnel training, and sales. Army Regulation 200-1 (chapter 5) outlines collection and expenditures systems. Fort Wainwright forestry funding requirements are listed in Appendix A.

The Army agriculture/grazing outlease program is a reimbursable program. This means that proceeds from outleases on an installation are first used to cover authorized expenses. Proceeds are allocated to the installations and U.S. Army Corps of Engineer districts based on the Agricultural/Grazing Outlease protocol. The use of revenue from agricultural and grazing outleases are restricted by law. Revenue may be used for reimbursement of the administrative costs of outleasing and the financing of multiple land-use management activities through established budget procedures.

Department of Defense fish and wildlife funds are collected through sales of permits for hunting, trapping or fishing on military controlled lands. They are authorized by the Sikes Act and regulated by Army Regulation 200-1 (chapter 6). These funds may be used only for fish and wildlife management on the installation where they are collected. They cannot be used for recreational activities. They are exempt from equipment purchase amount limitations, and they do not expire (un-obligated funds carry over on 1 October). Requirements for the Fish and Wildlife reimbursable funds are listed in Appendix A.

4.8.8.1.3 Facilities Program Funding

Army facilities are funded with two types of funding: Base Operating Support, and Sustainment, Restoration, and Modernization. It is the Army's plan to fund both of these accounts at 90% of the validated requirement.

The purpose of sustainment funding is to enable the Army mission by funding the sustainment of range and other facilities in good working order to meet long-term doctrinal training requirements. The purpose of restoration funding is to restore failed or failing facilities, systems, and components damaged by a lack of sustainment, excessive age, fire, storm, flood, freeze, or other natural occurrences, improves facilities to current standards. Modernization funding adapts facilities to meet new standards and includes the erection, installation, or assembly of a new real property facility, the addition, expansion, extension, alteration, conversion, or complete replacement of an existing real property facility.

Real Property Services funding provides for those activities of an installation support nature. It includes those support elements and services identified as indirect overhead by Headquarters Department of Army and grounds maintenance activities. This includes abatement and disposal of building hazardous waste resulting from the performance of real property services.

4.8.8.1.4 Sustainable Range Program Funding

There are three types of range program funding that affect the management of natural resources: range operations, range modernization, and Integrated Training Area Management funding. Range operations funding provides for the operation and management of training ranges, range modernization funding

upgrades range facilities, and Integrated Training Area Management funding rehabilitates and manages training areas.

Integrated Training Area Management funding enables the Army mission by funding the management and maintenance of training lands to sustain and enhance the capability to meet long-term doctrinal requirements.

Range operations funding enables the Army mission by funding the operation of ranges and training lands to sustain long-term doctrinal training requirement. Range operations funding also provides for record keeping of the number and type of munitions fired, communication and coordination with local public on noise issues, and the design and installation of signage for access controls to ensure safety and security of range facilities.

Range modernization funding enables the Army mission by funding the design and construction of ranges and the acquisition of training lands that are capable of sustaining long-term doctrinal training requirements.

4.8.8.1.5 Other Funding

The Legacy Program remains an additional source of funding. However, funding for the Legacy Program has been greatly reduced over past levels. The only types of Legacy projects available for funding are large projects, regional in scope, involving many other agencies as partners. While Fort Wainwright will continue to seek Legacy funding, it is not expected to be a viable source for implementing this INRMP.

4.8.8.2 Budgeting

The Environmental program works together with the Directorate of Resource Management to manage the environmental budget. Fort Wainwright uses work plans to communicate funding requirements to higher headquarters and to help manage the annual budget. Fort Wainwright uses both an environmental work plan (natural resources is included in this) and an Integrated Training Area Management work plan. There are also reimbursable program work plans that Fort Wainwright must submit annually to Headquarters, Department of the Army.

The Conservation annual work plan was created to develop requirements, plan spending, and track funding, obligations, and execution for natural resource projects and tasks. Each project contains the following information: project name, priority, project number and name, description, funding required, funding allocated, funding obligated, year funded, agency (in-house or contractor), National Environmental Policy Act requirements, Section 106 requirements, other permit requirements, primary Fort Wainwright point of contact, project status, and comments. The Conservation annual work plan is included as part of the environmental program work plan.

Reimbursable programs funding requirements are entered and tracked through the forestry, fish and wildlife, and agriculture outlease work plans in the Reimbursable Program Tracking System.

The Integrated Training Area Management Program works with the Deputy Chief of Staff for Resource Management to manage the Integrated Training Area Management budget. The installation work plan is developed in the summer and submitted in August of each year to reflect Integrated Training Area Management program requirements in detail for the following six fiscal years. The work plan reflects all Integrated Training Area Management activities for the installation. Once projects are identified, they are prioritized from most to least important. Approval of these projects and priorities is obtained from the USARAK Installation Range Office prior to completing the work plan. Once the projects are approved, they are entered into the Workplan Analysis Module database.

4.8.8.3 Contracting

The contracting process includes two primary components – purchase/acquisition and contract management. Purchase and acquisition is necessary to get a contract in place then contract management is necessary to ensure good communication between the government and contractor to enable good contract performance.

4.8.8.3.1 Purchase and Acquisition

The first step in the contract process is purchase and acquisition. Fort Wainwright Environmental starts the process by clearly defining desired services in a statement of work, estimating costs, and initiating a purchase request. Fort Wainwright Environmental works together with a contracting agency to develop an acquisition strategy, using the Sikes Act priority to guide decision-making.

The Sikes Act Committee Report defined natural resources management and conservation as "inherently governmental." Planning, implementation, enforcement or management of Army natural resources cannot be contracted. The first priority for implementation of this plan will be to use the Fort Wainwright in-house workforce. Fort Wainwright in-house capabilities include permanent natural resources employees, other Public Works organizations (such as roads and grounds, carpentry shop, etc.) and troop projects. These methods are usually the least expensive, but also tend to be the least flexible. All funds obligated toward in-house work must be expended in the current fiscal year. Due to the reduction of federal in-house positions, the amount of work that can be accomplished in-house dwindles every year.

Support to the natural resources program, where it can be separated from management, planning, implementation or enforcement actions of natural resources, may be contracted. The Sikes Act outlines priorities for contracting these implementation projects. When entering into contracts for services that implement natural resource management objectives or enforce natural resources laws (that is, wildlife management and endangered species plans and surveys), priority will be given to contracts with federal, state, and local agencies with responsibility for natural resources conservation. In other words, if an installation cannot utilize governmental personnel to do natural resources conservation technical support, then other federal and state natural resources agencies have, by this law, a "right of first refusal" to accept this work. In these cases competitive bids are not required.

When in-house staff or cooperating federal and state agencies cannot perform work, Fort Wainwright looks to one of three contract mechanisms. The Government Services Administration environmental services schedule provides companies that have already gone through an open bid process to be on the Government Services Administration contract. Contracting to one of these companies is relatively simple and fast. The Job Order Contract in place in Fort Wainwright provides quick and efficient service. However, when none of these other options is available, Fort Wainwright can use the open bid process through a contracting agency.

The Economy Act of 1932, as amended, allows federal agencies to obtain services directly from other federal agencies or utilize contracts already in place by other federal agencies. The Military Interdepartmental Purchase Request is used to acquire natural resource conservation services. Natural resources support services may also be obtained non-competitively through contracts with state and local agencies. In this case, a purchase request must be submitted through the Directorate of Resource Management to a contracting agency. Conservation personnel work together with the contracting agency to develop an acquisition strategy, statement of work, and government estimate. The government must prepare a statement of work and government estimate for each purchase request.

4.8.8.3.2 Contract Management

Once a contract is in place, Fort Wainwright Environmental must nominate a federal Contracting Officer's representative to help the Contracting Officer manage the contract. The Contracting Officer authorizes the Contracting Officer's representative to verify that the contractor performs the technical requirements of the contract, perform necessary inspections necessary, maintain liaison and direct communications with the contractor, monitor the contractor's performance, submit a monthly report concerning performance of services rendered and coordinate site entry for contractor personnel.

4.8.9 Regulatory Requirements

The Sikes Act, as amended through 2003, requires that INRMPs be prepared and implemented for each military installation, including withdrawn public lands. Each plan must be consistent with the use of military lands to ensure military preparedness and cannot result in any net loss in the capability of the installation to support the military mission.

Fish and Wildlife Coordination Act of 1936, as amended, includes requirements for agencies to coordinate management of fish and wildlife resources. The 1958 amendments added provisions to recognize the vital contribution of wildlife resources to the Nation and to require equal consideration and coordination of wildlife conservation with other water resources development programs, and authorized the Secretary of Interior to provide public fishing areas and accept donations of lands and funds. The amendments also titled the law as the Fish and Wildlife Coordination Act and expanded the instances in which diversions or modifications to water bodies would require consultation with the Fish and Wildlife Service. These amendments permitted lands valuable to the Migratory Bird Management Program to be made available to the State agency exercising control over wildlife resources.

The Migratory Bird Treaty Act prohibits the taking, possession, and trade of migratory birds, except as permitted by regulations. Penalties are enforced under 16 USC 707. The National Defense Authorization Act of 2003 (Public Law 107-314, 116 Stat.2458, Dec 2, 2002, 16 USC 703 note) Section 315, amended the Migratory Bird Treaty Act to allow authorization of "take/taking" incidental to military readiness activities if the military complies with certain conditions related to the management of effects on migratory birds. The "Authorization Act" further requires the Secretary of the Interior to promulgate such regulations with the concurrence of the Secretary of Defense.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" eagles, including their parts, nests, or eggs. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

The National Environmental Policy Act requires federal agencies to consider the environmental impact of actions taken. This act is a procedural and declarative act. For any federal action that is not a Categorical Exclusion, an environmental assessment must be made in order to determine if a full environmental impact statement must be prepared. The environmental impact statement must follow specific guidelines outlined in 50 CFR 1500-1508. The act does not require the federal agency to choose the least

environmentally destructive alternative; only that the agency considers the environmental impact and alternatives to the action.

The Endangered Species Act of 1973 (PL 93-205; 16 USC 1531-1543) protects any species (fish, wildlife, or plants) listed on the endangered species and the threatened species list from hunting, taking for importation, or exportation to or from the United States.

The Clean Water Act of 1977 (33 USC 1251-1387) stipulates effluent standards for the discharge of pollutants into navigable waters of the U.S. and promotes research at the federal and state levels concerning issues of water pollution. The Coastal Zone Management Act (PL 92-583; 16 USC 1451 et seq.) preserves, protects, develops, restores, and enhances the nation's coastal zones.

The National Historic Preservation Act of 1966 (as amended PL 89-665; 16 USC 470 et seq.) protects and preserves historic and prehistoric objects, structures, sites, and districts which are included in or are eligible for inclusion in the National Register. This act defines a decision-making process to be followed when planning an action in the vicinity of a historic area.

The Military Land Withdrawal Act (PL 106-65) withdrew Fort Wainwright's Yukon Training Area and Donnelly Training Area from the public domain for military use. The Military Land Withdrawal Act requires that the Army conduct significant natural resources mitigation on withdrawn lands. The Army was required to prepare a legislative environmental impact statement prior to the withdrawal and the Public Law 106-65 was enacted in the place of a Record of Decision. This law effectively requires the Army to complete all the existing and proposed mitigation written in the environmental impact statement. Natural resources mitigation required by this legislative environmental impact statement is included in this INRMP and is classified as high priority. *The USARAK Transformation Environmental Impact Statement was* prepared to assess the impacts of the conversion of the 172nd Infantry Brigade to the 172nd Stryker Brigade Combat Team and the conversion of the 501st Infantry Regiment to an Airborne Task Force. The Record of Decision for the *USARAK Transformation of USARAK EIS, Feb. 2004*, requires Fort Wainwright to mitigate significant impacts to natural resources.

4.8.10 Command Support

Command support is essential to implementation of this INRMP. Without this support, priority projects for natural resources management will not occur. Failure to execute these projects risks violation of environmental laws, reduced mission readiness, and negative public reaction to a lack of environmental stewardship. The Installation Commander is responsible for compliance with environmental laws and sets the tone for environmental stewardship. Command emphasis on this INRMP ensures a healthy environment, sustainable resources, and quality future training lands.

MEMORANDUM OF AGREEMENT BETWEEN U.S. ARMY GARRISON FORT WAINWRIGHT AND U.S. DEPARTMENT OF INTERIOR, U.S. FISH AND WILDLIFE SERVICE, AND ALASKA DEPARTMENT OF FISH AND GAME

Subject: Fish and Wildlife Cooperative Plan for Fort Wainwright, Alaska Lands

1. References

a. Department of Defense Instruction 4000.19, Interservice and Intragovernmental Support, dated 9 August 1995.

b. Public Law 86-797 (Sikes Act), dated 15 September 1960 (as amended through 2003 by Public Law 108-136).

c. Army Regulation 200-1, Environmental Protection and Enhancement, dated 13 December 2007.

2. Purpose

The purpose of this Fish and Wildlife Cooperative Plan is to list specific items of agreement between the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, and U.S. Army Garrison Fort Wainwright for cooperative implementation of the Fort Wainwright Integrated Natural Resources Management Plan. Items not specifically listed will generally be the responsibility of Fort Wainwright unless the other agencies agree to assist with their implementation. The Department of Defense, the Department of Interior, and the State of Alaska, through their duly designated representatives whose signatures appear on the Fort Wainwright Integrated Natural Resources Management Plan, specifically approve the Integrated Natural Resources Management Plan and the below items of cooperation.

In accordance with 16 USC 670a (Sikes Act), the Fish and Wildlife Cooperative Plan is the component of the Integrated Natural Resources Management Plan that describes how the fish and wildlife resources on Fort Wainwright lands will be cooperatively managed. The Fish and Wildlife Cooperative Plan provides a program of planning for, and the development, maintenance, and coordination of wildlife, fish, and game conservation. The Fish and Wildlife Cooperative Plan provides for fish and wildlife habitat improvements or modifications, wildlife considerations in all range rehabilitation, control of off-road vehicle traffic, use and protection of fish and wildlife resources, to include both consumptive and non-consumptive use, and natural resources law enforcement requirements, and designated responsibilities for the control and disposal of feral animals.

3. Problem

The Sikes Act (Public Law 86-797, dated 15 September 1960, as amended through 2003 by Public Law 108-136) requires U.S. Fish and Wildlife Service signatory approval of the Integrated Natural Resources Management Plan to acknowledge its compliance with the Endangered Species Act, Migratory Bird Treaty Act and other federal fish and wildlife laws. The Sikes Act also requires signatory approval by the Alaska Department of Fish and Game to allow for public recreation, hunting, trapping, and fishing. All signatories have a responsibility for the maintenance and protection of fish and wildlife resources and their associated habitats located on U.S. Army Garrison Fort Wainwright controlled lands. The continued

well-being of these resources will be enhanced through a cooperative effort designed to identify and protect areas essential to their life cycle and vulnerable to disturbance.

4. Scope

This agreement applies to Fort Wainwright, including Fort Wainwright Main Post, Tanana Flats Training Area, Yukon Training Area, Donnelly Training Area, Gerstle River Training Area, Black Rapids Training Area, Whistler Creek Rock Climbing Area, and all other Fort Wainwright controlled lands in Alaska.

5. Understanding, Agreements, Support, and Resource Needs

a. Natural Resource Conservation Program

(1) **All parties agree**:

(a) To work cooperatively to conserve fish and wildlife resources.

(b) To work cooperatively to ensure military preparedness and "no net loss" in the capability of U.S. Army Garrison Fort Wainwright to support the military mission.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Carry out the natural resources conservation program required by the Sikes Act to provide for the conservation and rehabilitation of natural resources on Fort Wainwright lands consistent with the use of military installations to ensure the preparedness of the Armed Forces; support the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non-consumptive uses; and subject to safety requirements and military security, allow public access to military installations to facilitate the use.

(b) Establish conservation and management programs for all lands under Fort Wainwright control. These programs will provide for the conservation and management of fish and wildlife resources and include provisions to conduct the necessary research to answer specific conservation / management problems. These programs will be developed with the assistance and technical advice of the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game. The programs will be consistent with military requirements and, to the greatest extent possible, compatible with U.S. Fish and Wildlife Service and Alaska Department of Fish and Game management plans.

(c) Furnish assistance and facilities to Alaska Department of Fish and Game, and/or U.S. Fish and Wildlife Service for mutually agreed upon natural resources research projects.

(d) Determine desired rules of conduct to be followed by authorized participants in the implementation of and participation in these programs.

(e) Admit representatives of Alaska Department of Fish and Game and U.S. Fish and Wildlife Service to the installation at reasonable times, subject to requirements of military necessity and security. Such personnel may use U.S. Army transportation on a non-reimbursable basis, to include aircraft, for wildlife related functions on Fort Wainwright lands provided such transportation is available without detriment to the military mission.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Furnish technical assistance for development and implementation of professionally sound natural resources programs on Fort Wainwright, provided funding for such support is available.

(b) Participate in the joint administration of these programs with all parties in this agreement.

(4) **Alaska Department of Fish and Game shall:**

(a) Furnish technical assistance for development and implementation of professionally sound natural resources programs on Fort Wainwright, provided funding for such support is available.

(b) Participate in the joint administration of these programs with all parties in this agreement.

b. Integrated Natural Resources Management Plan

(1) **All parties agree**:

(a) The Integrated Natural Resources Management Plan is the planning and implementation document required by the Sikes Act, as amended. The Integrated Natural Resources Management Plan contains those items specifically required by law. In the event the Sikes Act is amended after the Integrated Natural Resources Management Plan is signed, the Plan will be amended to conform with the new requirements within the Sikes Act, if needed.

(b) The Integrated Natural Resources Management Plan is prepared to assist installation commanders in their efforts to conserve and rehabilitate natural resources consistent with the use of military installations to ensure the preparedness of the Armed Forces.

(c) The primary purpose of the Integrated Natural Resources Management Plan is to establish natural resources goals, objectives, and policies that Fort Wainwright will use to manage Army lands in Alaska. It is the intent of Department of Defense to clearly and openly express these goals, objectives, and policies to the public through the Integrated Natural Resources Management Plan. The secondary purpose of the Integrated Natural Resources Management Plan is to guide Fort Wainwright natural resources managers and personnel in their decision-making regarding management of military land in Alaska and the implementation of proposed natural resource projects. Implementing the Integrated Natural Resources Management Plan would provide a land management program that conserves land as an essential asset for training, provides excellent stewardship, complies with environmental laws, and provides recreational opportunities that contributes to the quality of life. A further purpose of the Integrated Natural Resources Management Plan is to serve as a funding identification document for the management of natural resources on military lands.

(d) Implementation of the Integrated Natural Resources Management Plan measures, maintains, protects, and enhances the ecological integrity of the training lands and the biological communities inhabiting them. The Integrated Natural Resources Management Plan is considered to be “implemented” if U.S. Army Garrison Fort Wainwright actively requests, receives, and uses funds for “must fund” projects and activities; ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the Integrated Natural Resources Management Plan; coordinates annually with all internal and external cooperating offices; and documents

specific Integrated Natural Resources Management Plan action accomplishments undertaken each year.

(e) The Integrated Natural Resources Management Plan will be reviewed for "operation and effect" by Fort Wainwright, Alaska Department of Fish and Game, and U.S. Fish and Wildlife Service annually and updated not less often than every 5 years.

(f) This Integrated Natural Resources Management Plan is a Federal Facilities Compliance Agreement.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Prepare updates to the Integrated Natural Resources Management Plan not less often than every five years and coordinate review of these updates with U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.

(b) Coordinate annual reviews of the Integrated Natural Resources Management Plan with U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.

(c) Actively request, receive, and use funds for "must fund" projects and activities.

(d) Ensure that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the Integrated Natural Resources Management Plan

(e) Document specific Integrated Natural Resources Management Plan action accomplishments undertaken each year and provide those accomplishments to U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.

(f) Develop Fish and Wildlife, Forestry, Wildland Fire, and Threatened and Endangered Species Management Plans (components of the Integrated Natural Resources Management Plan) as well as individual burn plans that include provisions designed to improve wildlife habitat and/or meet specific watershed management objectives.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Review the Integrated Natural Resources Management Plan annually and provide comments.

(b) Participate in the update of the Integrated Natural Resources Management Plan not less often than every five years.

(4) **Alaska Department of Fish and Game shall**:

(a) Review the Integrated Natural Resources Management Plan annually and provide comments.

(b) Participate in the update of the Integrated Natural Resources Management Plan not less often than every five years.

c. Inventory and Monitoring of Fish and Wildlife Resources on Fort Wainwright Controlled Lands

(1) **All parties agree**:

(a) On priorities for monitoring and inventory of fish and game resources on Fort Wainwright lands.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) In cooperation with the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game, conduct annual monitoring of fish and wildlife resources on Fort Wainwright controlled Army lands according to the priorities identified in the Ecosystem Management Component of the Integrated Natural Resources Management Plan (Appendix G, Section SA). The inventory will include, but is not limited to, the following areas: location and description of the principal fish and wildlife resources; identification of the principal wildlife species actually or potentially present or migratory within the boundaries of Fort Wainwright lands, the condition of their habitat, and information on population numbers; identification of endangered and threatened species of fish and wildlife and habitat essential to their existence; identification of general population assessments of the principal fish species known to be present or migrating through or within Fort Wainwright lands, and observations regarding the quality of the aquatic habitat; and definition and description of the land and water areas suitable and available for public entry and their potential to support outdoor recreation.

(b) Share inventory and monitoring data with U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.

(c) Allow representatives of Alaska Department of Fish and Game and U.S. Fish and Wildlife Service access to training lands to the installation at reasonable times, subject to requirements of military necessity and security, to conduct fish and wildlife monitoring.

(d) Allow representatives of Alaska Department of Fish and Game and U.S. Fish and Wildlife Service access to restricted airspace above the installation at reasonable times, subject to requirements of military necessity and security, to conduct fish and wildlife monitoring.

(3) **U.S. Fish and Wildlife Service shall:**

(a) Provide technical advice and assistance, to the greatest extent possible, to U.S. Army Garrison Fort Wainwright for the conduct of an annual fish and wildlife monitoring.

(b) Share inventory and monitoring data with U.S. Army Garrison Fort Wainwright and Alaska Department of Fish and Game.

(4) **Alaska Department of Fish and Game shall:**

(a) Provide technical advice and assistance, to the greatest extent possible, to U.S. Army Garrison Fort Wainwright for the conduct of an annual fish and wildlife inventory.

(b) Share inventory and monitoring data with U.S. Fish and Wildlife Service and U.S. Army Garrison Fort Wainwright.

d. Enhancement of Fish and Wildlife Habitat Resources on Fort Wainwright Controlled Lands.

(1) **All parties agree**:

(a) To manage habitat on a landscape scale utilizing ecosystem management principles.

(b) That, like fish and wildlife resources, military training has its own habitat requirements, and the two will not be managed exclusively, except where by law (e.g. critical habitat designation under the Endangered Species Act) management of natural species habitat takes precedence. Habitat enhancement areas will be available for use by military training just as military firing ranges will continue to provide habitat for wildlife.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Develop or improve habitat for optimum conditions consistent with the objectives established in the Integrated Natural Resources Management Plan.

(b) Maintain a minimum of 50 acres of bison food plots on Donnelly Training Area. Over time the location of these food plots may move depending on military requirements and the location of bison.

(c) Avoid, when possible, vegetation clearing activities during 1 May through 15 July for non-military readiness activities to protect migratory bird nesting habitat.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Provide technical advice and assistance, to the greatest extent possible, to Fort Wainwright for the planning, coordination, and enhancement of wildlife habitat.

(4) **Alaska Department of Fish and Game shall**:

(a) Provide technical advice and assistance, to the greatest extent possible, to Fort Wainwright for the planning, coordination, and enhancement of wildlife habitat.

e. Harvesting of Fish and Wildlife Resources on Fort Wainwright Controlled Lands.

(1) **All parties agree**:

(a) All hunting, fishing, and trapping on Fort Wainwright lands will be in accordance with federal and state fish and game laws.

(b) A federal waterfowl stamp is required for hunting waterfowl on Fort Wainwright lands as prescribed by federal laws.

(c) Persons hunting or fishing the lands or waters of Fort Wainwright shall be required to obtain special U.S. Army Garrison Fort Wainwright Recreational Access Permits unless exempt by U.S. Army Garrison Fort Wainwright regulations. At present, there is no cost for these permits, but U.S. Army Garrison Fort Wainwright reserves the right to charge for these permits in the future. Any funds derived from the sale of these licenses would be used exclusively for the implementation of the Integrated Natural Resources Management Plan in accordance with Army regulations and the Sikes Act. Fees charged would be established by

the installation in accordance with Army regulations. Persons guilty of violating the requirement for these special licenses may be prosecuted under 10 USC 2671(c).

(d) Persons hunting, trapping, or fishing the lands of Fort Wainwright must purchase state licenses, tags, and stamps as required by Alaska Department of Fish and Game, unless exempt by Alaska Department of Fish and Game regulations. Military personnel on active duty and permanently stationed in Alaska may purchase special fishing and small game licenses at resident prices. Active duty military personnel, not including dependents, may hunt big game without licenses or tags on military lands open to hunting providing they follow Alaska Department of Fish and Game hunting regulations. A harvest ticket is required. Nonresident military hunters (lived in Alaska less than 12 months) stationed in Alaska must purchase nonresident hunting licenses and appropriate big game tags to hunt big game, but the tags will only cost one-half the normal nonresident price.

(e) Public access for hunting, trapping, and fishing is approved under a system of controls established by U.S. Army Garrison Fort Wainwright in cooperation with Alaska Department of Fish and Game. Civilians will be considered on an equal basis with military and Army civilian employees for permits and access to Fort Wainwright lands. Hunting, trapping, and fishing will be allowed only on those areas where there is no conflict with military training activities and no unreasonable safety hazard to participants, military personnel and dependents, or Army civilian employees. Certain areas will be closed to hunting and fishing, including, but not limited to impact areas containing unexploded ordnance and training areas with sensitive electronic equipment. Such areas will be marked as closed on installation hunting maps.

(f) Appropriate Migratory Bird Hunting Stamp(s) is/are required of all individuals 16 years of age or older hunting waterfowl on U.S. Army Garrison Fort Wainwright controlled lands. The possession of a special permit for hunting migratory game birds will not relieve the permittees of the requirements of the Migratory Bird Stamp Act, as amended.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Provide all military personnel, their dependents, and civilians every opportunity to harvest fish and wildlife on U.S. Army Garrison Fort Wainwright controlled lands. Hunting, trapping, and fishing on U.S. Army Garrison Fort Wainwright controlled lands in Alaska will be open to all military personnel, their dependents, and civilians during appropriate legally-established seasons, consistent with military requirements and public safety. All personnel utilizing Army lands will comply with applicable provisions of federal, state, and military fish and game laws and regulations.

(b) Hunting, trapping, and fishing on Fort Wainwright lands will be authorized and controlled by the Installation Commander in accordance with locally published installation regulations promulgated in compliance with applicable federal and state laws, Army regulations, military requirements, and the Integrated Natural Resources Management Plan.

(c) Provide Army Conservation Officers for hunting, trapping, and fishing law enforcement, as outlined in U.S. Army Alaska Regulation 190-13.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Provide enforcement personnel, if requested.

(b) Establish season and bag limits for harvest of migratory bird species.

(4) **Alaska Department of Fish and Game shall:**

(a) Provide enforcement personnel, if requested.

(b) Establish season and bag limits for harvest of game species.

f. Stocking or Transplanting Fish and Wildlife Resources on Fort Wainwright Controlled Lands

(1) **All parties agree**:

(a) All proposed introduction or reintroduction of wildlife species will be thoroughly assessed in accordance with the National Environmental Policy Act and associated U.S. Fish and Wildlife Service requirements to determine the impact on existing fauna and the installation mission.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Provide access to the Alaska Department of Fish and Game for the stocking of fish in designated lakes and streams.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Review all requests for stocking or transplanting to ensure there are no impacts to migratory, threatened, or endangered species.

(4) **Alaska Department of Fish and Game shall**:

(a) Continue to stock Fort Wainwright lakes.

(b) Determine the number and species of fish to be stocked based on angler use trends and fish availability.

(c) Prioritize the lakes and streams designated for stocking.

g. Protection of Fish and Wildlife Resources on Fort Wainwright Controlled Lands

(1) **All parties agree**:

(a) That the military mission supersedes natural resources management and such activities must in all instances be compatible with the military mission. However, where there is conflict between the military mission and provisions of the Endangered Species Act, Migratory Bird Treaty Act, State of Alaska fish and game laws, Bald and Golden Eagle Protection Act, or any other law associated with natural resources conservation, such conflicts will be resolved according to statutory requirements.

(b) That military operations and the presence of fish and wildlife resources are not mutually exclusive. Military operations and fish and wildlife resources can occupy the same area (i.e.,

training area) without a negative effect on either. However, certain species (rare, threatened, or endangered), during seasons when certain fish and wildlife are most sensitive (calving, nesting, spawning) and in sensitive habitats (high function wetlands), additional protections are warranted for the conservation of fish and wildlife resources.

(c) To work cooperatively to avoid conflicts between the military mission and fish and wildlife in such a way that effectively provides conservation for fish and wildlife resources and enables the military mission.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Conduct activities or operations in a way that would not directly adversely impact fish and wildlife resources. Soldiers shall not intentionally target wildlife when conducting firing activities and shall not intentionally harass fish and wildlife (defined here as intentionally driving or flying at fish and wildlife with the intent to move or change their movement).

(b) Minimize the unintentional take of migratory birds during military readiness activities. Migratory Bird Treaty Act prohibits "take" of migratory birds. However, the Department of Defense has been granted an exemption for military readiness activities that allows "unintentional take." This rule authorizes the Department of Defense to take migratory birds associated with military readiness activities, subject to certain limitations. The 2003 National Defense Authorization Act (Public Law 107-314, 116 Stat. 2458, Dec. 2, 2002, 16 U.S.C. 703 note) required the Secretary of Defense, in consultation with the Secretary of the Interior, to identify ways to minimize, mitigate, and monitor take of migratory birds during military readiness activities and required the Secretary to prescribe, with the concurrence of the Secretary of Defense, a regulation that exempts such activities from the Migratory Bird Treaty Act's prohibitions against take of migratory birds. This agreement further clarifies military readiness activities to include (1) air and ground maneuver training; (2) live-fire demolition, direct and indirect fire activities; (3) range construction, range upgrade and range maintenance activities which are required for military operational readiness; and (4) those vegetation management activities which directly support readiness activities and Soldier safety such as prescribed burning and mechanical or hand thinning to reduce fire danger in range training areas.

(c) Minimize activities or operations directly negatively impacting fish and wildlife during sensitive time periods or seasons. U.S. Army Garrison Fort Wainwright will notify the Alaska Department of Fish and Game or the U.S. Fish and Wildlife Service, as appropriate, when U.S. Army Garrison Fort Wainwright concludes that the presence of fish and wildlife during these time periods is too low for there to be significant effects from activities or operations.

- Minimize disturbance to bison calving areas on Donnelly Training Area from 15 April to 31 May if bison are present. The Army will minimize disturbance to bison pre-migration areas from 1 July to 31 August if bison are present. The Army will not conduct indirect fire operations within 2,000 meters of bison in the impact area during any time of the year. The Army will not conduct activities or operations within 500 meters of any bison during any time of year to minimize the impacts on bison.

-Minimize activities or operations in Oklahoma Impact Area or Delta Creek Impact Area from 1 May to 31 May for caribou pre-calving, calving, and post calving if caribou are present in significant numbers. The Army will not conduct indirect fire or bombing operations within 8,000 meters of caribou from 1 May to 31 May.

(d) Minimize activities or operations directly negatively impacting fish and wildlife during live fire training.

-Continue to ban the use of any munitions containing white phosphorus in wetlands.

-Never intentionally target or harass wildlife. Any action that disturbs fish and wildlife is considered harassment by federal and Alaska State law. Harassment includes such things as pursuit with vehicles or aircraft, feeding, and shooting of wildlife. Vehicles, watercraft, and aircraft, including helicopters, may not be used to herd/chase wildlife off the ranges or training areas. Individuals who harass fish and wildlife are subject to prosecution.

-Employ safety procedures to prevent the firing of munitions outside military reservation boundaries.

-Dedicated impact areas will remain permanently off limits to maneuver training and to all recreation.

-Implement range training and safety regulations.

-Continue to enforce existing range regulations requiring the use of burn pans during burning of excess propellant charges.

-Limit military operations and outdoor recreational activities in high function wetlands from 1 May to 15 July for migratory bird protection during nesting seasons.

(e) Implement programs designed to minimize impact on fish and wildlife resources and conserve their habitats.

-Continue to implement the most current Integrated Natural Resources Management Plan. The Integrated Natural Resources Management Plan contains specific actions to protect, inventory, maintain, and improve wildlife habitat and fisheries resources and protect water quality

-Continue to implement its natural resources conservation programs and ecosystem management. These programs improve the management of wildlife and fisheries resources and protect water quality.

-Continue to comply with federal and state laws and regulations relating to fish and wildlife conservation and management.

-Continue to implement existing training support programs such as Integrated Training Area Management, Range and Training Land Assessment, and Land Rehabilitation and Maintenance.

(f) Conduct military activities or operations in such a manner that will not adversely affect the characteristics of unique or sensitive habitats. Designate important or fragile natural areas with special protection status and manage such areas as “special interest areas” for their unique features.

-*Wood River and Clear Creek Buttes*. Buttes near Blair Lakes and along the Wood River have cultural and ecological significance. Many of these buttes have cleared helicopter pads for military training, especially since they are on high, relatively dry ground. These buttes will be placed off-limits to ground and vegetation-disturbing activities with exception of existing helicopter pads.

-*Tanana Flats Migratory Bird Special Interest Area*. The area between Crooked Creek and Willow Creek in the Tanana Flats Training Area harbors undisturbed fen wetlands and significant migratory bird nesting areas. No recreational activities are permitted in this area during 1 May through 15 July. This area presently has no trails and no new trails may be developed in this area.

-*Delta Bison Area*. U.S. Army Garrison Fort Wainwright has imposed restrictions to limit disturbance to bison calving areas from 1 April – 31 May, if bison are present. The Army can conduct military activities in these areas if they first consult with Alaska Department of Fish and Game.

-*Sandhill Crane Roosting Area*. U.S. Army Garrison Fort Wainwright has imposed restrictions to limit disturbance in sandhill crane areas each year from 25 April through 15 May, and 1 September through 30 September when sandhill cranes are present. The Army can conduct military activities in these areas if they first consult with Alaska Department of Fish and Game.

-*Delta Caribou Calving and Post-Calving Areas*. U.S. Army Garrison Fort Wainwright has agreed with Alaska Department of Fish and Game to suspend activities or operations that would adversely affect these areas during 15 May through 31 May without consultation. Restrictions in these areas are in effect only when caribou are present. In addition, to the extent practicable development and military actions in the caribou calving grounds will be conducted under winter conditions when there is sufficient snow cover and the ground is adequately frozen to minimize the damage to vegetation and soils.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Identify and describe additional unique or sensitive habitats within Fort Wainwright lands. U.S. Army Garrison Fort Wainwright must provide concurrence before any additional areas could be established.

(b) Identify the types of activities of operation that may be harmful or have significant, adverse effect on unique or sensitive habitats for species for which they have been designated.

(c) Identify the time periods or seasons when activities or operations should be restricted in order to protect wildlife species.

(4) **Alaska Department of Fish and Game shall**:

(a) Identify and describe additional unique or sensitive habitats within Fort Wainwright lands. U.S. Army Garrison Fort Wainwright must provide concurrence before any additional areas could be established.

(b) Identify the types of activities of operation that may be harmful or have significant, adverse effect on unique or sensitive habitats for species for which they have been designated.

(c) Identify the time periods or seasons when activities or operations should be restricted in order to protect wildlife species.

(d) Coordinate with Range Control regarding areas used by caribou and bison.

h. Control of Invasive, Nuisance and Feral Fish and Wildlife Resources on Fort Wainwright Controlled Lands.

(1) **All parties agree**:

(a) To work cooperatively to prevent the introduction of invasive species, to provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species may cause.

(b) No exotic species of fish or wildlife will be introduced on Fort Wainwright lands without prior written approval of U.S. Army Garrison Fort Wainwright, Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service.

(c) The Installation Pest Management Plan and the Integrated Natural Resources Management Plan serve as nuisance species (i.e., mew gull) management plans for the purpose of obtaining depredation permits.

(d) Make recommendations and develop procedures, as necessary, for joint management of nuisance or problem wildlife.

(e) Dispatch of nuisance or problem animals may only be done with the concurrence of Alaska Department of Fish and Game. Dispatch of nuisance animals is a last resort situation. Other possible alternatives include aversive conditioning and relocation. Dispatch should be considered for animals which are aggressive with people or for animals with an extensive history of garbage or nuisance behavior. Decisions concerning relocation or dispatch of nuisance animals should be made on a case-by-case basis considering the individual animal's past history.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Monitor invasive species populations, and track the presence and status of invasive species over time to determine when control measures are necessary and to evaluate the effectiveness of prevention, control/eradication, and restoration measures.

(b) Give priority to invasive species management actions, including actions to restore native species habitat conditions in ecosystems that have been invaded that support the installation's primary military mission.

(c) Plan actions to address invasive species that are consistent with management objectives in this Integrated Natural Resources Management Plan and undertaken only after appropriate review under National Environmental Policy Act as implemented by 32 CFR 561.

(d) Obtain a depredation permit from the U.S. Fish and Wildlife Service before any intentional take of migratory birds protected by the Migratory Bird Treaty Act. Under the Migratory Bird Treaty Act it is unlawful "by any means or manner, to purse, hunt, take, capture or kill" any migratory bird except as permitted by regulation (16 U.S.C. 703-704). Regulation (50 CFR 21.11) prohibits the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted in the implementing regulations. Where the purpose of an installation action is to intentionally and directly take any migratory bird species (e.g., eradicate nuisance birds; clear nesting, adding eggs), the installation must apply for and obtain a depredation, special purpose, or scientific collection and education permit or other regulatory authorization from the U.S. Fish and Wildlife Service prior to taking action(s) and record any birds purposefully and intentionally taken under the permit and provide an annual report to the U.S. Fish and Wildlife Service.

(e) Minimize the need to intentionally take nuisance wildlife (mammals, birds, insects) by implementing best management practices (as listed in Installation Pest Management Plan and Appendix G, Integrated Natural Resource Management Plan and) that deter presence in human conflict areas.

(f) Obtain depredation permits from Alaska Department of Fish and Game before removing any nuisance mammals.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Evaluate depredation permit applications and issue depredation permits for migratory birds in accordance with the Migratory Bird Treaty Act.

(b) Provide technical assistance and support to U.S. Army Garrison Fort Wainwright to minimize the need to intentionally take nuisance wildlife through the application of best management practices.

(4) **Alaska Department of Fish and Game shall**:

(a) Evaluate depredation permit applications and issue depredation permits for animals in accordance with the State of Alaska law. Approve/disapprove requests for relocation or dispatch of problem animals.

(b) Provide technical assistance and support to U.S. Army Garrison Fort Wainwright to minimize the need to intentionally take nuisance wildlife through the application of best management practices.

(c) Ensure animal safety and protection of public safety.

i. Protection of Public Access on Fort Wainwright Controlled Lands

(1) **All parties agree**:

(a) Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Integrated Natural Resources Management Plan provides for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of

fish and wildlife resources, subject to requirements necessary to ensure safety and military security.

(b) Fort Wainwright lands shall be made available to the public for educational or recreational use of natural and cultural resources when such access is compatible with military mission activities, ecosystem sustainability, and with other considerations such as security, safety, and fiscal soundness. Opportunities for such access shall be equitably and impartially allocated.

(c) Access by recreational users will be within manageable quotas, subject to safety, military security, threatened or endangered species restrictions, and the capability of the natural resources to support such use; and at such times as such access can be granted without bona fide impairment of the military mission, as determined by the U.S. Army Garrison Fort Wainwright commander.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Determination of the extent of equitable military and non-military access to be authorized for purposes of participation in the harvest and enjoyment of fish and wildlife resources on U.S. Army Garrison Fort Wainwright controlled lands subject to the limitations and considerations of military security, safety, and mission objectives.

(b) Issue Recreational Access Permits to ensure accountability, safety and continued access to recreational users on Fort Wainwright lands.

(c) Manage recreational access through use of the USARTRAK check-in-check out system.

(d) In order to insure continued public use and to prevent unnecessary damage to fish and wildlife habitats, U.S. Army Garrison Fort Wainwright will neither expand existing contaminated areas nor create new ones. This provision may be waived in the event of compelling needs and upon completion of environmental documentation. Contaminants are defined as dud-producing explosives, toxic substances, and other materials which would preclude public access to those lands, but do not include non-dud producing small arms ordnances.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Provide technical advice and assistance, to the greatest extent possible, to U.S. Army Garrison Fort Wainwright for the protection of public access and fish and wildlife resources on Fort Wainwright lands.

(4) **Alaska Department of Fish and Game shall**:

(a) Provide technical advice and assistance, to the greatest extent possible, to U.S. Army Garrison Fort Wainwright for the protection of public access and fish and wildlife resources on Fort Wainwright lands.

j. Control of Off-Road Traffic on Fort Wainwright Controlled Lands

(1) **All parties agree**:

(a) Army is a trustee of public lands and has a responsibility to protect and enhance environmental quality, conserve natural resources, and provide opportunities for outdoor recreation. However, it must be recognized that land under Army control was acquired solely for national defense purposes. Other uses are, therefore, secondary to mission needs.

(b) Off-road recreational vehicles are used in association with many activities in the Alaskan Interior. These vehicles are used to access hunting, fishing, and trapping areas, for recreational riding and for other activities.

(c) All land and water areas will be closed to off-road recreational use by motorized off-road recreational vehicles and watercraft except those areas and trails which are determined suitable and specifically designated for such under the procedures established in the Integrated Natural Resources Management Plan.

(d) Areas not available for off-road recreational use include areas restricted for security or safety purposes, such as explosive ordnance impact areas, areas containing geological and soil conditions, flora or fauna, or other natural characteristics of fragile or unique nature, which would be subject to excessive or irreversible damage by use of off-road recreational vehicles, areas where the use by a type or types of off-road recreational vehicles would cause unequivocal and irreversible damage or destruction as a result of such use, areas that are key fish and wildlife habitats, as identified under environmental consideration, areas that contain archeological sites, historic sites, petroglyphs, pictographs, or areas set aside for their scenic value, and areas in which noise would adversely affect other uses or wildlife resources.

(e) Off-road traffic includes both off-road recreational vehicles and motorized watercraft. Off-road recreational vehicles include snowmachines, dirt bikes, four-wheelers, swamp buggies, civilian use small unit support vehicles and four-wheel drive vehicles. The use of three-wheeled off-road recreational vehicles is not allowed anywhere on Fort Wainwright lands. Motorized watercraft include all boats with some type of motor attached, which includes jetboats, riverboats, and airboats.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Manage for a number of different types of public recreational use, including off-road traffic. All areas that are determined open for recreational use may be closed temporarily during periods of military use. All users must daily check in through USARTRAK to determine if areas are open to recreational use. U.S. Army Garrison Fort Wainwright uses the following classification system to describe recreation areas on the installation.

***-Open Use Area*:** Open to all types of off-road recreational vehicles. Open to all other recreational activities year-round During frozen conditions (6+ inches of snowcover) there are no restrictions for any off-road recreational vehicles. During unfrozen summer conditions, off-road recreational vehicles over 1,500 lbs (road vehicles, dune buggies, Argo's, small unit support vehicles, etc.) must stay on existing roads and trails. No restrictions for off-road recreational vehicles under 1,500 lbs (all-terrain vehicles, snowmachines, dirt bikes, etc.). Motorized watercraft must stay within existing open water channels.

-Modified Use Area: Open to all types of off-road recreational vehicles. No restrictions for any off-road recreational vehicles when soil is frozen. All off-road recreational vehicles must stay on existing roads and trails during the summer. Motorized watercraft

must stay within existing open water channels. Open to all other recreational activities year-round.

-Limited Use Area: Open to all non-motorized recreation (hunting, fishing, trapping, hiking, skiing, and berry picking) year-round but are not open to any type of off-road recreational vehicle at any time. Motorized watercraft must stay within existing open water channels.

-Special Use Management Area: An area managed for recreational use under specific rules that apply only to that area (i.e., Tanana Flats Training Area Airboat Special Use Management Area).

-Closed Area: Closed to all recreational activities year-round. Airfields, Tank Farm, Landfill, Small Arms Ranges, Impact Areas, Ammunition Storage Point.

(b) U.S. Army Garrison Fort Wainwright will manage Tanana Flats Training Area as an "open use area" except for the impact areas, which are always "closed use areas." In addition, the Integrated Natural Resources Management Plan proposes to apply specifically tailored rules to newly created Tanana Flats Training Areas 202 and 203 (bordered by Salchaket Slough, Willow Creek, Tanana River, and Bonnifield Trail). These training areas would be open to airboats and other motorized watercraft with no restrictions between 15 August and 1 April each year. Between 1 April and 15 July, training areas 202, 203 and 204 would be off limits to all off-road recreational vehicles, including airboats and other motorized watercraft. Between 15 July and 15 August, access into the lower fen (Training Area 202) and upper fen (Training Area 203) would be managed separately based on water levels. Access into Training Area 204 would remain closed to all motorized vehicles from 1 April to 30 October. Access into all other training areas during this time would remain open. This proposed policy does not affect rules and regulations for hunting, trapping or fishing. This proposed policy would apply to all recreational users, but does not apply to military training or other official use.

(c) Monitor recreational use to evaluate recreational impacts to ensure recreational use is not negatively affecting sensitive natural or cultural resources.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Provide technical support for the management of off-road traffic.

(4) **Alaska Department of Fish and Game shall**:

(a) Provide technical support for the management of off-road traffic.

k. Natural Resources Law Enforcement on Fort Wainwright Controlled Lands

(1) **All parties agree**:

(a) U.S. Army Garrison Fort Wainwright has primary law enforcement responsibility on Fort Wainwright lands.

(b) Many aspects of natural resources management require effective enforcement if they are to be successful. Such features as harvest controls, protection of sensitive areas, pollution

prevention, hunting and fishing recreation, non-game protection, and others are dependent upon effective law enforcement.

(c) Enforcement of laws primarily aimed at protecting natural resources and outdoor recreation activities are an integral part of the installation's natural resources management program. Game laws must be implemented in accordance with Alaska and federal laws and as approved by the U.S. Army Garrison Fort Wainwright Commander in the Integrated Natural Resources Management Plan.

(d) Effective law enforcement is critical to natural resources conservation and the continuance of hunting, trapping, and fishing programs on a sustained basis.

(e) U.S. Army Garrison Fort Wainwright conservation officers have concurrent jurisdiction.

(2) **U.S. Army Garrison Fort Wainwright shall**:

(a) Provide sufficient and qualified Army conservation officers for hunting, trapping, and fishing law enforcement, as outlined in the Integrated Natural Resources Management Plan and U.S. Army Alaska 190-13.

(3) **U.S. Fish and Wildlife Service shall**:

(a) Provide enforcement personnel, if requested.

(4) **Alaska Department of Fish and Game shall**:

(a) Provide enforcement personnel, if requested.

6. Financial Provisions

a. Services provided by the U.S. Army Garrison Fort Wainwright, U.S. Fish and Wildlife Service, and Alaska Department of Fish and Game, insofar as possible, will be provided on a non-reimbursable basis. Any expected reimbursement is to be specifically approved and funded prior to the service being provided.

b. Reimbursement will be provided through a mutually agreed upon funding document.

c. This Memorandum of Agreement can be used as a sole source justification in the development of a funding document. The Sikes Act outlines priorities for contracting natural resource management projects that can be separated from management, planning, or enforcement. When entering into contracts for services that implement natural resource management objectives or enforce natural resources laws (that is, wildlife management and endangered species plans and surveys), priority will be given to contracts with federal, state, and local agencies with responsibility for natural resources conservation. Natural resources support services may be obtained non-competitively through contracts with federal and state agencies.

7. Effective Date

a. This agreement becomes effective upon the date of last signature. It will remain in effect until revised/superseded or terminated in writing.

b. This agreement will be reviewed every five years or sooner if changing conditions or circumstances warrant ensuring that its terms, provisions, and intent are current.

c. This agreement may be modified or terminated at anytime with the consent of all parties, or unilaterally terminated when the initiator provides 180 days written notice to the other parties.

8. Supersession: This agreement supersedes AK-MOA-250 between U.S. Army Alaska, U.S. Fish and Wildlife Service and Alaska Department of Fish and Game.

LITERATURE CITED

Alaska Department of Fish and Game. 2011. *Statewide Stocking Plan for Recreational Fisheries, 2011-2015*. Juneau, AK. 127 pp. + appendices.

Alaska Natural Heritage Program. 2006. Vascular Plant Tracking List for Alaska, April 18, 2006. 8 pp. Unpublished Report on file as reported from the Heritage web site http://aknhp.uaa.alaska.edu/botany/Botany_tracking_page.htm. The Alaska Natural Heritage Program, University of Alaska Anchorage, 707 "A" Street, Anchorage, AK.

Alaska Wildland Fire Coordinating Group. 1998. Alaska Interagency Wildland Fire Management Plan, www.dnr.state.ak.us/forestry/pdfs/98AIFMP.pdf Date visited: July 10, 2006. 67 pp.

Anderson et al. 2000 (Referencing Yukon training area cliff and tree nesting raptors section 4.4.4.2)

Bonito, L.J. 1980. *Final Environmental Impact Statement Concerning Proposed Land Withdrawal for the 172nd Infantry Brigade (Alaska) at Fort Wainwright*. Fort Wainwright, AK. 112 pp. + appendices.

Bureau of Land Management and U.S. Army. 1994a. *Fort Greely: Resource Management Plan, Final Environmental Impact Statement.* Bureau of Land Management, Steese/White Mountains District and U.S. Army, 6th Infantry Division (Light). Anchorage, Alaska. 132 pp.

Bureau of Land Management and U.S. Army. 1994b. *Fort Wainwright Yukon Training Area*. Resource Management Plan and Final Environmental Impact Statement. Bureau of Land Management, Anchorage, AK. 109 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States Fish and Wildlife Service. Washington, DC.

Fort Greely. 1998. *1998- 2002 Fort Greely Integrated Natural Resources Management Plan.* Fort Greely, Alaska + Appendices.

Fort Greely. 2002. *2002-2006 Fort Greely Integrated Natural Resources Management Plan.* Fort Greely, Alaska + Appendices.

Fort Wainwright. 1998. *1998 – 2002 Fort Wainwright Integrated Natural Resources Management Plan.* Fort Wainwright, Alaska + Appendices.

Fort Wainwright. 2002. *2002-2006 Fort Wainwright Integrated Natural Resources Management Plan.* Fort Wainwright, Alaska + Appendices.

Fort Wainwright. 2005b. Fort Wainwright Ecosystem Management Plan. Unpublished. 25 pages.

Fort Wainwright. 2008. *FWA Installation Pest Management Plan.* Prepared by the U.S. Army Corps of Engineers. Unpublished.

[HQ USAPAC] Headquarters, U.S. Army Pacific. 1996. *Implementation Plan for Realignment of Fort Greely*. 6 pp + appendices.

Higginbotham/Briggs & Associates. 1991. *Installation Design Guide*. Prepared for Fort Wainwright under direction of Alaska District, Corps of Engineers, Anchorage, AK.

Jorgenson, et. al. 2007. *Investigations of Impacts to Fen Ecosystems and Wildlife from Airboat Traffic on the Tanana Flats, Fort Wainwright, 2002-2006*. Prepared for US Army Alaska by ABR, Inc. and Far North Aquatics. 114 pages.

Noss, R. F., and A. Y. Cooperrider. 1994. *Saving Nature's Legacy: Protecting and Restoring Biodiversity*. Island Press, Washington, D.C.

Quirk, W.A., W. Gossweiler, and E. Kiker. 1978. *Natural Resources Conservation Program*. A Management Plan for Natural Resources on 172d INF BDE Lands, Alaska. 30 pp. + app.

Racine, C.H., R. Bishop, C. Collins, P. Kuropat, and J. Walters. 1990. *The Use and Environmental Impacts of Airboats on the Tanana Flats, Fort Wainwright, Alaska*. U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover, NH. 123 pp. + appendices.

Racine, C., R. Lichvar, and M. Duffy. 1997. *An Inventory of the Vascular Flora of Fort Greely, Interior Alaska. 2001*. U.S. Army Cold Regions Research and Engineering Laboratory, Special Report TR-01-5.

USAGAK. 2007. *2007-2011 U.S. Army Garrison Integrated Natural Resources Management Plan*. Fort Richardson, Alaska plus appendices.

USAGAK. 2010. *Range Complex and Training Land Upgrades Finding of No Significant Impact and Programmatic Environmental Assessment.* Fort Wainwright and Fort Richardson, Alaska.

USARAK. 1970. *Wildlife and Fisheries Plan for Fort Jonathan M. Wainwright, Alaska*. Natural Resources Branch, Fort Wainwright, AK. 23 pp. + appendices. Revised March 1970.

USARAK. 1981. *Natural Resources Management Plan, Fort Wainwright, Alaska*. Natural Resources Branch, Fort Wainwright, AK. 27 pp. + appendices.

USARAK. 1991. *The Early History of Ladd Field, 1938 - 1943*. Natural Resources Report #91-1, Junior D. Kerns, ed., Fort Wainwright, AK. 16 pp.

USARAK. 1995. *The Army in Alaska*. A U.S. Army-authorized publication by Blake Publishing of Alaska, Inc., Fort Wainwright, AK. 88 pp.

USARAK. 1999. *Final Legislative Environmental Impact Statement for Alaska Army Lands Withdrawal Renewal.* USARAK: Fort Richardson, Alaska.

USARAK. 2004. *Transformation of USARAK Environmental Impact Statement, Vols. I & II.* Fort Richardson, AK.

USARAK 2005. *Environmental Assessment and Finding of No Significant Impact for Conversion of the Airborne Task Force to an Airborne Brigade Combat Team.* Fort Wainwright, Alaska.

USARAK. 2006a. *Final Environmental Impact Statement for the Construction and Operation of a Battle Area Complex and Combined Arms Collective Training Facility within U.S. Army Training Lands in Alaska, Vols. I &II.* Department of the Army.

USARAK. 2009. *Stationing and Training of Increased Aviation Assets within U.S. Army Alaska Environmental Impact Statement.* Fort Wainwright, AK.

U.S. Army Corps of Engineers. 2007. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0). United States Army Corps of Engineers Environmental Laboratory. Vicksburg, MS.

U.S. Department of Army. 2009. Army Regulation 200-1 Environmental Protection and Enhancement. U.S. Government Printing Office: Washington DC.

U.S. Department of Army. 2010. FY10-17 Army Environmental Funding Guidance. Washington D.C.

U.S. Department of Defense. 2008. DOD Instruction number 4150.07. U.S. Government Printing Office: Washington DC

The Keystone Center. 1996. *A Department of Defense Biodiversity Management Strategy*. Keystone Center Policy Dialogue on Department of Defense Biodiversity, Final Report. Keystone, CO. 38 p.