

Chapter 3. Ecosystem Management

"Sustaining our Nation's military training and testing lands through ecosystem management is among the most important DOD environmental goals"¹²

Fort Richardson'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 2002-2006 with one important addition. Maintaining functional ecosystems is now the goal of the Fort Richardson 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 no new training lands are being created. This means that functional ecosystems on army lands must be sustained indefinitely. Thus the future of Fort Richardson and its military mission, as well as the community that depends upon the installation, relies on maintaining functional ecosystems.

3.1 Ecosystem Management Goals

DOD has endorsed ecosystem management nation-wide. The DOD goal with regard to ecosystem management is: *"To ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, that approach shall maintain and improve the sustainability and biological diversity of terrestrial and aquatic (including marine) ecosystems while supporting sustainable economies, human use, and the environment required for realistic military training operations."¹³* 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 for Fort Richardson are:

- Provide an indicator of ecosystem integrity, and status of sensitive species or communities.
- 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 non-game species.
- Ensure that Fort Richardson'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 DOD'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.

The intermediate steps needed to achieve these goals are:

- Develop a vision of sustaining ecosystem integrity.
- Develop priorities and reconcile conflicts in land-use decisions.

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- Maintain the sustainability and native biological diversity of ecosystems.
- Manage in consideration of ecological scales and evolutionary time frames.
- Support sustainable human activities, including the military mission.
- Develop coordinated approaches to work toward ecosystem integrity.
- Use realistic benchmarks to monitor and evaluate outcomes.
- Use joint planning between natural resources managers and military operations personnel.
- Integrate conservation of ecosystem integrity into INRMP, ITAM, 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.

3.2 Ecosystem Management Planning

Ecosystem management program planning and management includes all the planning, budgeting, contract oversight, and organization necessary to implement the ecosystem management program. The primary emphasis for this component of the ecosystem management program is the preparation and update of the ecosystem management action plan every five years.

3.2.1 Ecosystem Management Plan

Description and Justification: Prepare, update, and implement an ecosystem management action plan for Fort Richardson. The ecosystem management program at Fort Richardson strives to integrate the use of the land by a large number of organisms, including humans. This integration of land-uses, or management of multiple-uses, is accomplished at a broad, landscape scale (see section 3.4 for more discussion of the ecosystem management program). An important part of the ecosystem management plan is the selection of species for management and the determination of specific monitoring and management actions for each species. The ecosystem management plan also develops a GIS-based protocol to help with the resolution of current and predicted land-use conflicts. This is done both for conflicts between habitats for wild species and 'habitats' for human land-uses, and between the two major human land-use categories, recreational and military land-use. Updates of the ecosystem management plan are required by Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain an ecosystem management action plan.
- Maintain ecosystem integrity at the landscape scale while allowing the military to train and maintain combat readiness.
- Involve federal and state resources agencies in ecosystem management planning, and the public in review of the ecosystem management program..

Management History: The first ecosystem management action plan for Fort Richardson will be completed in 2001.

Current Management: Current management actions to update the ecosystem management action plan will cease in 2002. If this INRMP is not approved and funded, no new ecosystem management action plan will be prepared, updated, or implemented. Policies already in place in the current ecosystem management action plan will continue.

Proposed Management: Conduct ecosystem management on Fort Richardson as outlined in Table 3-1.

Table 3-1. Ecosystem Management Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Evaluate and make changes to the ecosystem management plan, as needed, following an adaptive management approach.	USARAK Natural Resources	High	x	x	x	x	x
Prepare a comprehensive update of the ecosystem management plan, for the period 2007-2011.	USARAK Natural Resources	High					x
Complete NEPA documentation for the update.	USARAK Natural Resources	High					x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current ecosystem management action plan.

3.2.2 Aerial Monitoring Plan for Ecosystem Management

Description and Justification: Prepare, update, and implement an aerial monitoring action plan for ecosystem management at Fort Richardson. Because of accessibility problems for much of Fort Richardson's land, aerial monitoring is a tool that is required to keep track of military, recreation, trespass, and fish and wildlife use of training lands. This plan discusses the specific actions necessary to accomplish aerial monitoring on Fort Richardson. Updates of the aerial monitoring action plan are required by Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain the aerial monitoring action plan for ecosystem management.
- Increase efficiency of monitoring efforts on Fort Richardson through aerial monitoring planning.
- Involve resource agencies in planning for aerial monitoring, and the public in review of the aerial monitoring plan.

Management History: The first aerial monitoring action plan for Fort Richardson was completed in 2001.

Current Management: Current management actions to update the aerial monitoring action plan for ecosystem management will cease in 2002. If this INRMP is not approved and funded, no new aerial monitoring plan will be prepared, updated, or implemented. Policies already in place in the current aerial monitoring action plan will continue.

Proposed Management: Prepare and update the aerial monitoring action plan for ecosystem management as outlined in Table 3-2.

Table 3-2. Aerial Monitoring Plan for Ecosystem Management.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Evaluate and make changes to the aerial monitoring plan, as needed.	USARAK Natural Resources	High	x	x	x	x	x
Prepare a comprehensive update of the aerial monitoring plan, for the period 2007-2011.	USARAK Natural Resources	High					x
Complete NEPA documentation for the update.	USARAK Natural Resources	High					x

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current aerial monitoring action plan for ecosystem management.

3.3 Inventory and Monitoring for Ecosystem Management

The inventory and monitoring components of the ecosystem management program will be conducted using the concept of adaptive management. Simply put, adaptive management involves learning from one's mistakes, and then applying those lessons to the management program. Adaptive management will be used to evaluate the results of all the inventory and monitoring programs at Fort Richardson, and ecosystem management actions as well, and this information will then be used to make changes as needed. The inventory and monitoring programs listed in Chapters 3 through 7 of this plan, and especially Chapter 5, are used as the primary sources of data for the process of adaptive management in the ecosystem management program.

3.4 Ecosystem Management Program

3.4.1 Maintenance of Ecosystem Integrity

As stated above, the goal of the ecosystem management program at Fort Richardson is to maintain ecosystem integrity and continue 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). USARAK is using an ecosystem management process to maintain ecosystem integrity on Fort Richardson 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.

DOD is developing a policy for the management of ecosystem integrity that will use the INRMP process as the implementation tool. A first step in this process was the preparation of *A Department of Defense (DOD) 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 an 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 NEPA.

3.4.2 Ecosystem Management Program Procedures

The basic strategy of the ecosystem management program, in attempting to both maintain ecosystem integrity and promote military training, is to integrate the use of the land by a large number of species, including humans. Critical to the ecosystem management program at Fort Richardson, but a common theme in all ecosystem management programs (Grumbine, 1994; Yaffee et al., 1996), is the treatment of human land-use as a component of the ecosystem. Under ecosystem management humans are not viewed as outsiders, but as members of ecosystems, just as other wild species are members of ecosystems. Human use of the land is directly incorporated into the management program from the start (see below). Then with a set of land-users (wild species and humans), the goal is to manage at scales large enough to maintain a set of critical habitats and habitat corridors for a large number of species while also facilitating use of the land for military training. The scale of management is currently the entire post at Fort Richardson. Eventually we would like to see coordination in land management with adjacent land holders, as this will more adequately represent regional ecosystems, especially for the larger bird and mammal species, but currently we are limiting management to lands directly under army control. In our decision-making processes, however, we will, as much as possible, take into account the landscapes that are contiguous with Fort Richardson.

The ecosystem management program at Fort Richardson uses a habitat-based approach. This is because (1) habitats are critical for the continued survival of animal and plant populations, (2) it is next to impossible to directly monitor the population sizes of all the important species occurring in any single ecosystem, and (3) we can manipulate vegetation and create or restore habitats for some species. The first step in constructing this habitat-based model for ecosystem management is to determine the set of species to be managed. In selecting species for management, we use four objectively determined criteria representing both biological and human social attributes, and strive to avoid strong subjectivity in the selection process. The list focuses on species of conservation concern, ecologically important predator and prey species, and game species. For vascular plants, all the plants occurring on Fort Richardson that are also listed in the Alaska Natural Heritage Program's Plant Tracking Database are included for management. For birds, all the species occurring on Fort Richardson that are also present on the National and Boreal Partners In Flight Program's listings of conservation priority species are included. There are no similar lists of species of conservation concern for mammals, but species known to be rare nationwide and/or in Alaska are included for management. Currently there are 96 species on this list for Fort Richardson (35 birds, 34 mammals, 22 vascular plants, 4 fish, and 1 amphibian).

With a set of species to manage, we then determine the habitat preferences for each species and create spatially explicit data for each species in a GIS. Habitat preferences are assigned using the combined knowledge of many biological field workers in Alaska and local knowledge of the natural history at Fort Richardson. Habitat preferences are currently based upon a digital vegetation map for Fort Richardson, but in the near future these data will be created using an ecological land classification for the area. This ecological land classification will categorize areas sharing similar vegetation, elevation, topography, landforms, soils, and hydrology.

To model the integration of land-uses across the landscape, we make use of existing GIS data layers representing how the military uses the land and how recreational land-uses occur across Fort Richardson. Initially we start with a formal designation of areas to be set aside for intensive human-use, areas for less intensive human-use (some alteration of habitats may occur), and areas in which no alteration of natural habitats will occur. This process is described in more detail in Chapter 5, Section 5.4.4.2, see especially Figure 5-7. By performing overlay operations of these human land-use GIS data layers upon each other, and also sequentially overlaying each human land-use data layer upon each of the species habitat preference data layers (above), we can pinpoint areas where conflicts in land-use may occur. We can also use this same process to predict how proposed changes in human land-use, for example, will affect the habitats of numerous species on Fort Richardson. Using a landscape approach on the GIS, we will then evaluate the predicted changes in habitats for each species based upon the amount of preferred habitat remaining for each species elsewhere on post, and the geographic pattern of those habitat patches. In other words, we will evaluate both the size and connectivity of remaining habitat patches to decide whether a proposed habitat change will be biologically significant or not.

These spatial data on current and predicted conflicts between military and recreational land-uses, and between human land-uses and species' preferred habitats will be used heavily in the land-use decision making processes at Fort Richardson. They will not eliminate the hard choices that often have to be made, but they will provide much needed data for a number of species, for example, that have traditionally been overlooked in such land-use decisions. These data will also provide a larger, landscape and multi-species perspective from which to make land-use decisions.

It is important to remember that in all land-use decisions, military training is by definition the primary land-use at Fort Richardson. Other appropriate land-uses will be accommodated if they fit within the framework of the military mission. The maintenance of ecosystem integrity, however, as noted at the beginning of this chapter, often is not at odds with the goals of military training. The following sections discuss the details of the integration of public access for recreational purposes, and the integration of the management of natural resources with the land-use activities conducted by the military.

3.4.3 Ecosystem Users

As mentioned above in section 3.4.2, human land-use under ecosystem management is considered a component of the ecosystem. Range Control is the primary entity responsible for integrating the various human activities across the landscape. Fort Richardson is on public domain land withdrawn for military purposes and therefore the military has primary use of the land. The ITAM program exists to spread that use across the landscape into areas that can best fit with the type of training being conducted. This minimizes disturbance to the ecosystem from the military mission. Military use, however, does not occur at all locations at all times of year. This allows for recreational users, subsistence users, and commercial users to all utilize Fort Richardson in varying degrees.

3.4.4 Land-Use

This section defines the various land-uses that occur on Fort Richardson.

3.4.4.1 Land-Use and the Military Mission

Military Use: Military land-use on Fort Richardson 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 (ARTEP).

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 ARTEP 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. Military land-use categories on Fort Richardson are shown in Figure 3-1. Descriptions for each military land-use category are listed in Table 3-3.

Table 3-3. Military Land-Use.

General Land-Use Type	Primary Military Land-Use Category	Secondary Military Land-Use Category	Size	Description
Urban Areas	Cantonment Area		? acres	The cantonment area is where most of the buildings are located. These built up areas include buildings for office use, indoor training facilities and housing for soldiers and their families.
	Recreation Areas		? acres	Areas are designated as recreation areas when recreation use is the primary land-use. Examples include Otter Lake Recreation Area and the Moose Run Golf Course.
	Ammunition Storage		? acres	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	? acres	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 that 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 area for back blast safety zones which can have a secondary use as non-dudded impact area or maneuver area.
		Non-Dudded Impact Areas	? acres	A surface danger zone or a non-dudded impact area is an area that has designated boundaries within which ordnance which 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.
<i>Integrated Natural Resource Management Plan</i>				<i>Fort Richardson, Alaska</i>

General Land-Use Type	Primary Military Land-Use Category	Secondary Military Land-Use Category	Size	Description
		Dudded Impact Areas	? acres	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	? acres	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 which occur in maneuver areas include conducting offensive operations, conducting tactical movement, movement to contact, relocating a unit to a new site, defend assigned area, relocating/establishing new area of operations, trail construction, mobility and counter mobility operations, reducing obstacles with equipment, and constructing obstacles with equipment.
		Bivouac Areas	? acres	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	? acres	Foot use areas are areas that show little or no impacts from military use. Foot use areas are areas where units are on foot and are conducting movement to contact and land navigation.
		Drop Zones	? acres	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	? acres	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	? acres	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	? acres	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.
		Right-of-Ways	? acres	Right-of-ways are any area 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	? acres	Excavations are gravel pits or military engineer training areas and similar types of areas that show signs of digging, either manual or mechanical.

Natural Resources Management Use: There are a number of natural resources management land-uses on Fort Richardson. Integrated Training Area Management, forest management, fish and wildlife management, habitat management, wetlands management, watershed management, fire management, endangered species management, special interest areas management, pest management, cultural resource management and minerals management all have spatial components and land-based requirements. These land-uses and their associated programs and projects are discussed in greater detail in the following sections of Chapter 3, and in Chapters 4, 5, and 6.

Recreation and Subsistence Use: Hunting, trapping, fishing, off-road vehicle use, skiing, boating, and cutting firewood all have land-based requirements. A map showing areas open for various recreation and subsistence activities is found in Chapter 6 (Figure 6-1).

Commercial Use: Commercial timber sales is the primary commercial use that has a spatial component and land-based requirements. A map showing potential areas for commercial timber sales is found in Chapter 5 (Figure 5-2).

Right-of-ways, Easements and Leases: There are a number of existing right-of-ways, easements, and leases on Fort Richardson. The Glenn Highway, various power lines, etc. all have land-based requirements.

3.4.4.2 Surrounding Land-Use

Fort Richardson borders a number of developed areas, with Anchorage and Elmendorf Air Force Base (AFB) to the west and the communities of Eagle River, Chugiak, and Birchwood to the northeast (Figure 1-1). The population of Anchorage exceeds 250,000, which is over 40 percent of the state population (1995 census data), and continues to grow. Expansion of the city is greatly restricted by Fort Richardson and Elmendorf AFB to the east and north, Knik Arm to the west, Turnagain Arm to the south, and Chugach State Park to the south and east. The 13,215-acre Elmendorf AFB base shares many of Fort Richardson's natural features but is more developed. The town of Eagle River, located along Highway 1 (the Glenn Highway), is a suburb of Anchorage.

Chugach State Park, the post's largest neighbor, lies along Fort Richardson's eastern and southern border. It encompasses approximately one half million acres and is one of the largest state parks in the nation. It provides the public with recreational wilderness experiences, such as mountaineering, hiking, fishing, hunting, skiing, and camping.

3.4.5 Public Access, Encroachment, and Trespass

Public access and use of Fort Richardson is an important component of ecosystem management. The following section discusses military land-use and policy concerning access, trespass, and encroachment.

3.4.5.1 Public Access Policy

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. USARAK, 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 at Fort Richardson. In maintaining a liberal policy of public access, USARAK 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 Richardson for recreation is authorized at specific entrances only, and all recreation activities must be conducted in accordance with applicable rules and regulations.

The Sikes Act states: “*Consistent with the use of military installations to ensure the preparedness of the Armed Forces, each integrated natural resources management plan prepared... shall, to the extent appropriate and applicable, provide for... (F) 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; (G) public access to the military installation that is necessary or appropriate for the use described in subparagraph (F), subject to requirements necessary to ensure safety and military security; ...*”.

DOD Directive 4715.3, *Environmental Conservation Program*, May 3, 1996, states, “*.. Those [DOD] 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.*”

Paragraph 2-10 of Army Regulation 200-3, *Natural Resources -- Land, Forest, and Wildlife Management*, states that 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 installation commander.*”

USARAK’s policies regarding public access are within both the spirit and letter of federal law and Army and DOD’s policies, and they will be continued in 2002-2006.

3.4.5.2 Public Access and Military Land-Use

The amount of limitations and restrictions on public access depends on the type of military land-use. Military land-use can be broken down into four general categories that affect access.

3.4.5.2.1 Training areas and non-firing facilities

Fort Richardson has 16 major training areas (TA). TA 16 is used for the Alaska National Guard facility. TA 15 is small and relatively isolated. TAs 1, 2, 6-12, and 14 are subdivided using letter designations, giving Fort Richardson a total of 30 training areas.

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, mineral or vegetative resource extraction, hunting, fishing, trapping, bird watching, hiking, skiing, sledding, dog mushing, and ORV use. In general, activities that are not compatible with training areas include any permanent non-military structures, easements, or leases.

3.4.5.2.2 Firing ranges and surface danger zones

USARAK Regulation 350-2, Table B-1, lists 32 small arms and crew-served ranges on Fort Richardson. These ranges include two demolition ranges (Demo II and Demo III, listed as a single range), that are

similar to non duded impact areas. They also include nine mortar firing points (listed as a single range) located throughout the northern training area, and nine artillery firing points (listed as a single range), also throughout the northern training area. The list of ranges includes a skeet and trap range, that is used primarily for recreation. In addition, the post has surface danger zones which are the same as non-duded impact areas associated with small arms ranges.

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.

3.4.5.2.3 Duded impact areas

USARAK Regulation 350-2, Chapter 5, describes impact areas on Fort Richardson. There is one major impact area, ERF, composed of 2,165 acres.

Public access into duded 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 duded impact areas include any ground-based natural resources management, any digging whatsoever, mineral extraction, commercial timber sales, hunting, fishing, trapping, bird watching, ORVs of any kind, dog mushing, airboats, camping, new construction, easements, and leases.

3.4.5.2.4 Urban Areas

Fort Richardson's cantonment area is defined (for purposes of this INRMP) as those lands with buildings and facilities, along with their contiguous natural lands. This category includes most areas that are not part of training or impact areas. It comprises 5,760 acres on Fort Richardson, with 568 buildings, an airfield, and other developed areas. Some grounds are maintained intensively, but many areas are unimproved and provide wildlife habitat.

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, hiking, skiing, and sledding. In general, activities that are not compatible with urban areas are hunting, trapping, and fishing.

3.4.5.3 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 right up along side an installation boundary often results in conflicts with the public resulting from noise and dust. USARAK is committed to working with surrounding landowners to minimize these types of potential conflicts.

Over the last ten years, USARAK 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 non-military purposes. Requests often have included commercial or long-term real estate interests involving right-of-ways, easements, land-

use permits, leases, outgrants, land transfers, exclusive use areas, and special concessions. This has been especially evident on Fort Richardson; some of the more notable of these include:

- A public snowmachine trail and corridor through Fort Richardson connecting Anchorage and Eagle River along the Glenn Highway.
- A new right-of-way for the Alaska Railroad through Fort Richardson from Anchorage to Birchwood.
- A real estate action to allow the Municipality of Anchorage to develop Clunie Lake on Fort Richardson into a float plane base.
- Transfer of approximately 30 acres of Fort Richardson land to the Anchorage School District for a middle school.
- Allow Bartlett High School to establish an official cross-country ski trail on Fort Richardson lands.
- Conduct commercial rafting operations on the Eagle River portion of Fort Richardson.
- Development of a destination resort, RV camping areas, horseback riding trails, ORV areas, and associated recreational activities in Fort Richardson's Arctic Valley.
- Use of Fort Richardson's protected waterfowl nesting areas for dog training by the Alaska Retriever Club.
- Siting of a Chugach Electric generation plant on Fort Richardson.
- Use of Fort Richardson lands by Ford Motor Company to test and advertise their vehicles.
- Use of Fort Richardson lands for establishment of an oyster farm adjacent to Eagle River.
- 300 acres of Fort Richardson training lands transferred to the Municipality of Anchorage for a landfill.
- 65 acres of Fort Richardson lands transferred to Cook Inlet Region, Inc.
- 65 acres of Fort Richardson lands transferred to Elmendorf Air Force Base for new hospital site.
- Port of Anchorage city bypass through Fort Richardson.

Present day Fort Richardson, at roughly 61,000 acres, is a fraction of its original size (161,000 acres). The loss of all these training lands over the years, coupled with the fact that urban development now surrounds much of the installation has and continues to force this Command to greatly limit and constrain much of its training activities. Despite this, Fort Richardson still offers our combat soldiers a valuable opportunity to train in a remarkable and varied environment. Its rugged beauty is also a key factor in enhancing our soldiers' and their families' quality of life. Unique in both its natural resources and its geographic location next to Alaska's largest city, Fort Richardson rises from sea level to over 5,300 feet within a distance of only twelve miles. Contained within its borders are all the ecosystems from maritime to alpine, and the diversity of plant and animal life that occur there.

As the populations of Anchorage and its satellite communities continue to grow and develop, it is anticipated that attempts to obtain or use portions of Fort Richardson for non-military purposes will persist and probably increase. The term "military purpose" with regard to land-use means programs, activities, and facilities necessary to accomplish the military mission and those support elements crucial to its implementation. Any additional long-term non-military uses will create the potential for adverse impact on training and thereby threaten Fort Richardson's viability as a military installation. Besides the mission, USARAK is mandated by both law and common sense, through sound stewardship, to preserve the integrity and health of the environment. Only by doing this can the military be assured of maintaining the realistic backdrops and scenarios crucial to its training.

It is, therefore, the position of USARAK to generally deny requests for non-military uses of Fort Richardson 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. The only exceptions to this will be when such actions clearly

result in tangible benefits to the military training mission or to the environment. These situations will be carefully scrutinized and evaluated by appropriate staff. No longer is "good public relations" alone, a justifiable reason to sacrifice limited and crucial training lands. It also is the position of USARAK to adopt a policy which favors temporary, non-commercial low-impact uses of Fort Richardson by the local community, consistent with training and the military mission, as long as Fort Richardson natural resources will not be impacted adversely. Examples of some of these activities now in effect are:

- Use of the small arms ranges by the Alaska Rifle Club, Alaska State Troopers, Anchorage Police Department, Alaska State Park Rangers.
- Dog mushers, snowmachiners, and ATV riders in specified areas.
- Cross country skiing.
- Firewood cutting.
- Iditarod sled dog race.
- Alaska Retriever Club dog trials.
- Special Olympics.
- Boating and rafting.
- Hunting and fishing.
- Boy Scouts, Girl Scouts, and Cub Scouts.
- Youth programs such as Campfire.
- Iron Dog Snowmachine Race.
- Wildlife Museum, open to the public.
- Use of Otter Lake and Cottonwood Park by the public.
- Youth Corps and High School JROTC training.

This Integrated Natural Resources Management Plan will serve as the Command's guideline and directive for administering and managing natural resources on Fort Richardson lands and waters. It is implemented by both the USARAK Conservation and Integrated Training Area Management programs, primarily through the Public Works Environmental Resources Division and the Directorate of Plans, Training, Security and Mobilization. It will be consulted and used for every decision and action that affects or has a potential to impact Fort Richardson's lands, waters, and other natural resources.

3.4.5.4 Trespass

Illegal entry onto Fort Richardson is the most common form of trespass. Trespass is often the precursor to other illegal range activities. Most illegal activities either directly or indirectly affect natural resources. Since trespass is often the first step to most illegal range activity, reducing illegal 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 boundary is fenced or marked with signs which adds to the problem. However, trespass is often premeditated. Marking 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.

Trespassing is a problem on Fort Richardson. Failure to enforce hunting, fishing, and trapping check-in requirements makes trespassing difficult to control on Fort Richardson. It also adds safety risk if people become lost or have emergencies.

3.4.6 Fort Richardson as Part of a Ecoregional Mapping Effort

Fort Richardson is cooperating with the Alaska office of The Nature Conservancy and other government agencies and individuals to produce an ecoregional biodiversity map for the Cook Inlet Ecoregion. This map will identify areas within the Cook Inlet Ecoregion that are hotspots of biological diversity or that have critical habitats for species of conservation concern in Alaska. This effort is focused on the Cook Inlet Ecoregion because it has the largest growing human population in the state, and therefore the most threats to ecosystem integrity in the coming years. Fort Richardson is committed to working with other land holders in the Cook Inlet Ecoregion to promote the long-term maintenance of ecosystem integrity throughout the entire Cook Inlet Ecoregion.

3.4.7 Land Management Units

3.4.7.1 Military Training Areas

Fort Richardson schedules and controls military training and other land-use with military training areas. Fort Richardson has 16 major training areas (TAs; see Figure 3-2). TA 16 is used for the Alaska National Guard facility. TA 15 is small and relatively isolated. TAs 1, 2, 6-12, and 14 are subdivided using letter designations, giving Fort Richardson a total of 30 training areas. Figure 3-2 shows Fort Richardson training areas.

3.4.7.2 Ecological Management Units

Ecological management units on Fort Richardson have been created to integrate fish, wildlife, and plant management with military and other land-uses. Ecological management units and sub-units closely follow training area boundaries to allow more effective management, since the primary land-use, military training, is scheduled by training area. Recreational land-use is also allocated by training area in most cases.

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 on Fort Richardson are shown in Figure 3-2.

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

Intensive Management: Intensive 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 intensive 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 management.

The following sections describe each ecological management unit and list management objectives. Following each ecological management unit are descriptions of ecological management sub-units listing location, public access policies, compatible uses, management priorities, and summaries of management alternatives.

3.4.7.2.1 Fort Richardson North Post

Location and Description: Fort Richardson North Post consists of all lands north of the Glenn Highway. This ecological management unit is broken down into three sub-units. The first sub-unit is North Post Training Areas sub-unit. This sub-unit contains eleven level to gently rolling training areas, which encompass Malamute and Neibhur Drop Zones, McLaughlin Range, two demolition ranges, and twenty firing points.

The second sub-unit on Fort Richardson North Post is the Eagle River Flats Impact Area (ERF). ERF is a 2,165 acre estuarine salt marsh in the northwestern portion of Fort Richardson, used as the primary ordnance impact area for the post since the mid-1940s. It is also an important habitat for waterfowl, and a variety of other wildlife species.

The third sub-unit in this ecological management unit is the North Post Urban Areas (urban lands). This sub-unit is composed of several disjunct areas, including the ammunition storage areas, all the buildings and improved grounds, Bryant Army Airfield, Otter Lake Recreation Area, Cottonwood Park, and several areas off-limits to training because of soil contamination.

Land-Use: The North Post Training Area sub-unit is suitable for small arms, platoon- to brigade-sized exercises, company-sized live-fire exercises, road marches, and bivouacs. This sub-unit is primarily used for 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. Other compatible uses include natural resource management, habitat improvement, mineral or vegetative resource extraction, hunting, fishing, bird watching, hiking, skiing, sledding, dog mushing, and ORV use. Waterfowl hunting on the post is limited to areas north of Eagle River. Fishing below the Route Bravo Bridge on Eagle River is prohibited due to the Eagle River Flats Impact Area. Fishing is also prohibited on Otter Creek and within 300 feet of the outflow dam on Otter Lake. On Ship Creek, fishing is permitted beginning 300 yards downstream of the Fort Richardson Fish Hatchery only. Activities that are not compatible with the North Post Training Area sub-unit include digging in wetlands without a permit, and any permanent non-military structures, easements or leases.

The ERF sub-unit is suitable for indirect fire weapon training and aerial gunnery exercises. The area is impacted by small arms and dud-producing munitions. This sub-unit has been classified as a high hazard impact area. Other compatible uses include remote monitoring of natural resources and military impacts. Military maneuver is prohibited in ERF Impact Area. 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. Other activities that are not compatible with this sub-unit include any on the ground natural resources management, digging in wetlands without a permit from the Army Corps of Engineers, mineral extraction, hunting, fishing, trapping, bird watching, ORVs of any kind, dog mushing, airboats, camping, new construction, easements, and leases.

The North Post Urban Areas sub-unit can support small unit training, classroom training, individual training, non-fire range facilities, housing, and office facilities. Other compatible uses include improved grounds management, natural resources management, fishing, bird watching, hiking, skiing, camping, and new construction. Activities that are not compatible in the North Post Urban Areas are live-fire military training and ORV use.

Public Access: Public access is allowed in the North Post Training Areas and the Cantonment Area 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 ERF Impact Area sub-unit (see Figure 3-3).

3.4.7.2.2 Fort Richardson South Post

Location and Description: Fort Richardson South Post ecological management unit is composed of all lands south of the Glenn Highway, and is broken down into three sub-units. The South Post Ranges sub-unit consists of two disjunct areas, and contains all of the small arms ranges, their surface danger zones, and all of the Davis Range and its surface danger zone.

The second sub-unit in the Fort Richardson South Post ecological management unit is the South Post Urban Areas sub-unit. This sub-unit is composed of several disjunct areas, including the golf course, the Range Control offices, the dam and gaging station on Ship Creek, and several other small urban sites.

The third sub-unit in this ecological management unit is the South Post Training Areas sub-unit. This sub-unit consists of all the remaining lands on the south post, which is largely mountainous terrain.

Land-Use: The South Post Ranges sub-unit is suitable for direct fire weapon training. The area is impacted by small arms. This sub-unit has been classified as a non-duded impact area. Other compatible uses include live fire maneuver training, monitoring of natural resources and military impacts, and prescribed burning to reduce fire hazards and improve habitat. Other activities not compatible with this sub-unit include digging in wetlands without a permit from the Army Corps of Engineers, hunting, fishing, trapping, bird watching, ORVs of any kind, dog mushing, airboats, camping, new construction, easements, and leases.

The South Post Urban Areas sub-unit can support small unit training, classroom training, individual training, non-fire range facilities, housing, and office facilities. Other compatible uses include improved grounds management, natural resources management, golfing, fishing, bird watching, hiking, skiing, camping, and new construction. Activities that are not compatible in the South Post Urban Areas are live-fire military training and ORV use.

The South Post Training Areas sub-unit is suitable for small arms, platoon- to company-sized exercises, and company-sized live-fire exercises. This sub-unit is primarily used for military training exercises, and occasionally for airborne drops. Other compatible uses include natural resource management, hunting, bird watching, hiking, skiing, and berry picking. Activities that are not compatible with the South Post Training Areas sub-unit, include digging in wetlands without a permit, ORV use, and any permanent non-military structures, easements or leases.

Public Access: Public access into the South Post 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. Public access into the Small Arms Range Complex is restricted to times when the ranges are not being used. Access is only allowed after checking with Range Control and gaining permission (see Figure 3-3).

3.5 Ecosystem Management Alternatives

3.5.1 Current Management

Ecosystem management has not been implemented on Fort Richardson. Under the current management, all on-going projects will be continued. Current public access policy, as outlined in Sections 3.4.5.1 and 3.4.5.2, will remain in effect. Current encroachment policy, as outlined in Section 3.4.5.3, and trespass policy, as described in Section 3.4.5.4, will also remain in effect. Fire management will continue, with full protection for the North and South Post Urban Areas and the North and South Post Training Areas sub-units, and limited protection for the ERF Impact Area sub-unit. USARAK will comply with Section 404 of the Clean Water Act and obtain permits, if necessary, to dig in or disturb wetlands. Hunting and fishing programs will continue. USARAK will manage recreation by controlling access.

Under the current management alternative, no new ecosystem management planning, inventory, monitoring, or management actions, as listed under the proposed management section below, will be conducted after current management actions cease in 2002.

3.5.2 Proposed Management

Under the proposed management alternative, USARAK will manage the North Post Training Areas and South Post Ranges ecosystem management sub-units as a full management areas, the North and South Post Urban Areas sub-units as intensive management areas, the South Post Training Areas sub-unit as a modified management area, and the Eagle River Flats sub-unit as a limited management area. USARAK will maintain public access as outlined in Sections 3.4.5.1 and 3.4.5.2, will limit encroachment as outlined in Section 3.4.5.3, and will manage trespass as outlined in Section 3.4.5.4. Fire protection categories for all sub-units will be full protection, except for Eagle River Flats which will receive limited protection.

Under the proposed management alternative, USARAK will comply with all laws, regulations, and Executive Orders pertaining to natural resources management. USARAK will complete on-going projects, conduct annual updates and five-year rewrites of the ecosystem management plan and the aerial monitoring plan, and conduct full implementation of ecosystem management projects. USARAK will conserve physical resources by conducting Integrated Training Area Management (ITAM), watershed management, and minerals management. USARAK will conserve biological resources by conducting wetlands management, forest management, fish and wildlife management, endangered species management, pest management, and urban area management. USARAK will integrate social (human) resources into ecosystem management by conducting education, awareness and public outreach, conservation enforcement, outdoor recreation management, and cultural resources management. USARAK will support ecosystem management decision making through implementation of NEPA, GIS, and other decision support systems, and integration with other land management programs such as RTLP and RPMP.

Proposed Management Objectives:

- Manage North Post Training Areas sub-unit as a Full Management Area.
- Manage ERF Impact Area sub-unit as a Limited Management Area.
- Manage North and South Post Urban Areas sub-units as Intensive Management Areas.
- Manage South Post Training Areas sub-unit as a Modified Management Area.
- Manage South Post Ranges sub-unit as a Full Management Area.
- Maintain public access as outlined in Sections 3.4.5.1 and 3.4.5.2.
- Limit encroachment as outlined in Section 3.4.5.3.

Table 3-4. Proposed Management Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct Soil and Water Quality Monitoring	USARAK Natural Resources	High	x	x	x	x	x
Conduct Conservation Enforcement.	USARAK Natural Resources	High	x	x	x	x	x
Conduct Wetlands Monitoring	USARAK Natural Resources	High	x	x	x	x	x
Conduct Wetlands Management	USARAK Natural Resources	High	x	x	x	x	x
Conduct Endangered, Threatened, and Rare Species Management	USARAK Natural Resources	High	x	x	x	x	x
Conduct Erosion Control and Streambank Stabilization	USARAK Natural Resources	High	x	x	x	x	x
Conduct Fish and Wildlife Monitoring	USARAK Natural Resources	High	x	x	x	x	x
Conduct Geographic Information Systems Projects	USARAK Natural Resources	High	x	x	x	x	x
Conduct Planning-Level Soil Survey Updates	USARAK Natural Resources	High	x	x	x	x	x
Conduct Planning-Level Floristic Inventory Updates	USARAK Natural Resources	High	x	x	x	x	x
Conduct Planning-Level Vegetation Survey Updates	USARAK Natural Resources	High	x	x	x	x	x
Conduct Planning-Level Wetlands Survey Updates	USARAK Natural Resources	High	x	x	x	x	x
Conduct Planning-Level Fauna Survey Updates	USARAK Natural Resources	High	x	x	x	x	x
Conduct Environmental Awareness	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Natural and Cultural Resources Education and Awareness	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Soil and Water Quality Management	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Recreational Use Management	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Training Requirements Integration	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Land Condition-Trend Analysis Monitoring	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Land Rehabilitation and Maintenance	USARAK Natural Resources	Medium	x	x	x	x	x

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct Special Interest Areas Management	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Fish and Wildlife Management	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Recreational Use Monitoring	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Habitat Management	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Forest Inventory	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Forest Management	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Fire Inventory	USARAK Natural Resources	Medium	x	x	x	x	x
Conduct Urban Area Management	USARAK Natural Resources	Medium	x	x	x	x	x

Other Management Alternatives Considered and Eliminated: There are many different options for conducting ecosystem management on Fort Richardson. Funding only high priority projects is certainly one option. This option, however, will not fully cover USARAK's stewardship responsibilities to manage Fort Richardson. Options to provide more intensive management of the ecosystem at Fort Richardson are cost-prohibitive. There are no other options for public access. Public access is already allowed to the maximum extent possible around the military mission. Encroachment is not compatible with the long-term, sustainable military mission, and therefore no other options for uses other than military-use can be considered.

3.6 Ecosystem Management Responsibilities

Ecosystem management on Fort Richardson is the primary responsibility of USARAK. Coordinating the many land-uses on post is the responsibility of DPTSM Range Control, while management of natural resources and recreation is the responsibility of DPW. Most commercial uses and all leases, easements, and right-of-ways must be permitted by BLM, with concurrence by USARAK. The BLM, USFWS, and ADF&G play integral roles in ecosystem management, both on the installation and in regional ecosystem management efforts.