Chapter 4
Cumulative Impacts and Secondary Effects

4.0 CUMULATIVE IMPACTS AND SECONDARY EFFECTS

4.1 CUMULATIVE IMPACT ANALYSIS PRINCIPLES

The approach taken to analyze cumulative effects for the *Environmental Impact Statement for the Modernization and Enhancement of Ranges, Airspace, and Training Areas in the Joint Pacific Alaska Range Complex in Alaska* (*JPARC Modernization and Enhancement EIS*) meets the objectives of the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) regulations, and CEQ guidance. CEQ regulations (40 [Code of Federal Regulations] CFR 1500–1508) provide the implementing procedures for NEPA. The regulations define cumulative effects as follows:

> … the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7).

Interactive effects may be either countervailing—the net cumulative effect is less than the sum of the individual effects—or synergistic—the net cumulative effect is greater than the sum of the individual effects. The CEQ handbook for considering cumulative effects advises that focusing the cumulative effects analysis on meaningful cumulative impact issues, rather than on all conceivable impact relationships, is critical to the success of the analysis in supporting better decisions about the proposed action and alternatives (CEQ 1997). The handbook also advises that cumulative effects be analyzed in terms of the specific resources, ecosystem, and human community that may be affected by the proposed action or alternatives. The analysis must consider how cumulative effects may be manifested over short and long timeframes, and how they may cause meaningful impacts extending into areas that may exceed political or administrative boundaries. Each affected resource, ecosystem, and human community must be analyzed in terms of its own capacity to accommodate additional effects, based on its own time and space parameters.

In 2005, CEQ released additional guidance regarding consideration of past actions and noted that it is not practical to analyze how the cumulative effects of an action interact with the universe. Instead, the analysis of environmental effects must focus on the aggregate effects of past, present, and reasonably foreseeable future actions that are truly meaningful. Furthermore, the scope of the cumulative impact analysis is related to the magnitude of the environmental impacts of the proposed actions.

Proposed actions of limited scope do not typically require as comprehensive an assessment of cumulative impacts as proposed actions that have significant environmental impacts over a large area (CEQ 2005).

For the proposals under consideration to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined impacts of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the impacts of the proposed action, must be significant. Second, the proposed action must make a substantial contribution to that significant cumulative impact. Finally, if the impacts of the proposed action alone would have a significant impact on an environmental resource within its region of influence (ROI), then the impacts of the proposed action in combination with all other past, present, and reasonably foreseeable actions would normally be cumulatively significant.

4.2 CUMULATIVE IMPACT METHODOLOGY

The cumulative effects analysis for this Environmental Impact Statement (EIS) builds upon the findings of the cumulative effects of other sources used to prepare this EIS. The aggregate effects of implementing combinations of the 12 JPARC proposals are evaluated in this chapter. Also considered is the overall cumulative effect of implementing the EIS proposals within a wider context influenced by other actions (both military and non-military) in the ROI. This chapter provides a qualitative assessment of these interactions for each of the resource topics addressed in the EIS.

The following five projects listed below were developed as part of the *JPARC Master Plan* but did not meet the criteria for inclusion in the EIS proposals. These projects will be included only in the cumulative impacts analysis presented in this EIS. These projects are independently required and will be analyzed for decisions in separate NEPA analyses.

- Low-Altitude Tactical Navigation (LATN) Training (Air Force)
- Urban Target Set (Army)
- Additional Dry Targets (Air Force)
- High Angle Mountain Marksmanship Range (HAMMR) (Army)
- Helicopter Gunnery (Army)

The following projects will be analyzed for a decision in this document:

- Fox 3 Military Operations Area (MOA) Expansion/Paxon MOA Addition (Air Force)
- Realistic Live Ordnance Delivery (RLOD) (Air Force)
- Battle Area Complex (BAX) Restricted Area Addition (Army)
- R-2205 Expansion, including the Digital Multi-Purpose Training Range (DMPTR) (Army)
- Night Joint Training (NJT) (Air Force)
- Unmanned Aerial Vehicle (UAV) Access (Army)

The following six actions need additional planning or are preceded by independent actions and are being analyzed programmatically with as much detail as is available in this EIS:

- Enhancement of Ground Maneuver Space (EGMS) (Army)
- Tanana Flats Training Area (TFTA) Roadway Access (Army)
- Joint Air–Ground Integration Complex (JAGIC) (Army)
- Intermediate Staging Bases (ISB) (Army)
- Missile Live-Fire for AIM-9 and AIM-120 in the Gulf of Alaska (GOA) (Air Force)
- Joint Precision Airdrop System (JPADS) Drop Zones (DZs) (Air Force)

4.3 JPARC CUMULATIVE IMPACT GEOGRAPHIC BOUNDARY

Geographic boundaries for analyses of cumulative impacts can vary for different resources and environmental media. The geographic boundary for the majority of resources analyzed for cumulative impacts in the JPARC Modernization and Enhancement EIS are within, contiguous to, or near JPARC

land and air resources under the jurisdiction of, and managed by, the U.S. Department of Defense (DoD). One programmatic proposal, the Missile Live-Fire for AIM-9 and AIM-120, involves the GOA.

The boundaries of each resource study area for cumulative impacts may be broader than the boundaries used for analyzing the direct impacts of each proposal. As examples, for air quality the potentially affected air quality regions are the appropriate boundaries for assessment of cumulative impacts from releases of pollutants into the atmosphere. For wide-ranging or migratory wildlife, any impacts of the various proposed actions might combine with the impacts of other activities or processes within the ecological range of affected populations and ecosystems.

4.4 JPARC EIS COMBINED PROPOSAL IMPACTS

Decisions for this EIS may implement one or several of the EIS proposals and specific alternatives. In some cases, the decision may indicate a specific alternative for a proposal. In others, such as the UAV Access proposal, the decision may include one or more corridors (or none), depending on the outcomes of this EIS. Table 4-1 indicates the full extent of overlap between the proposals, and provides a quick view of which airspace elements and geographic areas (on the ground/surface) could experience additive activity.

Establishing multiple JPARC capabilities may intensify some training activity in restricted airspace overlying military land and may increase munitions expenditures at existing impact areas. However, none of the actions represent an additive increase in training missions. The JPARC actions in this EIS would augment how, what, and where training takes place, but would serve the current authorized unit training and major flying exercise (MFE) requirements.

Table 4-1. JPARC EIS Proposals and Alternatives Geographic Overlap Matrix (Air or Ground or Both)

Proposed Action	Expanded Fox 3 MOA and New Paxon MOAs	RLOD	BAX Restricted Airspace Addition	R-2205 Expansion/ DMPTR	Night Joint Training	UAV RA Access	TFTA Roadway Access	Enhanced Ground Maneuver Space	JAGIC	ISBs	Missile Live-Fire	JPADS
EIS Study Areas of Effect	**Fox 3 MOA/ Paxon ATCAA**	**R-2202/ R-2211**	**BAX RA R-2202/ CFA**	**Yukon MOA/ R-2205/ YTA**	**Selected Alaska MOAs**	**Linkage between R-221, R-2202, R-2205**	**TFTA**	**DTA, YTA, TFTA**	**DTA, YTA, TFTA**	**DTA, YTA, TFTA**	**GOA**	**R-2205, R-2202 environs**
Airspace Interactions												
R-2202		A	A		A	A			A			A
R-2205				A	A	A			A			A
R-2211		A			A	A			A			
Fox 3 MOA	A				A							
Paxon ATCAA	A				A							
Eielson MOA		A			A	A						
Birch MOA					A	A						
Delta MOA			A		A	A						
Buffalo MOA			A		A							
Viper MOA				A	A	A						
Yukon MOA				A	A	A			A			
Stony MOA	A				A							
GOA-TMAA											A	
GOA-W-612											A	
Fairbanks International Airport				A								
Class D airspace (Eielson AFB)				A		A						
CCT Controlled Firing Area (CFA)			A									

Table 4-1. JPARC EIS Proposals and Alternatives Geographic Overlap Matrix (Air or Ground or Both) *(Continued)*

Proposed Action	Expanded Fox 3 MOA and New Paxon MOAs	RLOD	BAX Restricted Airspace Addition	R-2205 Expansion/ DMPTR	Night Joint Training	UAV RA Access	TFTA Roadway Access	Enhanced Ground Maneuver Space	JAGIC	ISBs	Missile Live-Fire	JPADS
EIS Study Areas of Effect	**Fox 3 MOA/ Paxon ATCAA**	**R-2202/ R-2211**	**BAX RA R-2202/ CFA**	**Yukon MOA/ R-2205/ YTA**	**Selected Alaska MOAs**	**Linkage between R-221, R-2202, R-2205**	**TFTA**	**DTA, YTA, TFTA**	**DTA, YTA, TFTA**	**DTA, YTA, TFTA**	**GOA**	**R-2205, R-2202 environs**
Ground Areas												
YTA				G	a/g	a		G	G	G		g
DTA-West		G/g			a/g	a		G	G	G		g
DTA-East			G		a	a				G		
TFTA		G/g			a	a	G	G	G	G		g
Fort Greely			a			a				G		g
Fort Wainwright						a						
Eielson AFB						a						
Fairbanks-Delta Junction corridor		a	a		a	a	G			G		g
Richardson Highway Corridor	a		a		a							g
Alaska Highway Corridor	a				a	a						
Glennallen Highway Corridor												
Parks Highway corridor					a							
Talkeetna Mountains	a				a							
Alaska Range	a				a							
Paxson/Tok/Dot area	a				a							
Upper Yukon					a							
Chena/Steese area					a				a			g
Upper Tanana Basin (east of Fairbanks)		a/g	a	a	a				a			g
Matsu Borough	a				a							

Table 4-1. JPARC EIS Proposals and Alternatives Geographic Overlap Matrix (Air or Ground or Both) *(Continued)*

Proposed Action	Expanded Fox 3 MOA and New Paxon MOAs	RLOD	BAX Restricted Airspace Addition	R-2205 Expansion/ DMPTR	Night Joint Training	UAV RA Access	TFTA Roadway Access	Enhanced Ground Maneuver Space	JAGIC	ISBs	Missile Live-Fire	JPADS
EIS Study Areas of Effect	**Fox 3 MOA/ Paxon ATCAA**	**R-2202/ R-2211**	**BAX RA R-2202/ CFA**	**Yukon MOA/ R-2205/ YTA**	**Selected Alaska MOAs**	**Linkage between R-221, R-2202, R-2205**	**TFTA**	**DTA, YTA, TFTA**	**DTA, YTA, TFTA**	**DTA, YTA, TFTA**	**GOA**	**R-2205, R-2202 environs**
Ground Areas (continued)												
FNSB	a				a		G		a	G		g
Denali Borough	a				a							g
East/SE Alaska	a				a							
Wood /Little Delta River area		a/g			a							g
Gulf of Alaska/Cook Inlet											a/g	
GOA coastal zone											a	
Copper River Basin Area	a				a							

Key: DTA=Donnelly Training Area; EIS=Environmental Impact Statement; FNSB=Fairbanks North Star Borough; GOA=Gulf of Alaska; ISB=Intermediate Staging Base; JPADS=Joint Precision Airdrop System; MOA=Military Operations Area; R-=Restricted Area; RA=restricted airspace; RLOD=Realistic Live Ordnance Delivery; TFTA=Tanana Flats Training Area; TMAA=Temporary Maritime Activities Area; UAV=unmanned aerial vehicle; YTA=Yukon Training Area.

A=airspace; airspace operations overlap, interact or expand existing Special Use Airspace.

G= ground-disturbing activity.

a= noise effects from flight activity on surface/ground.

g=weapons hazard zone (potential surface closure/restricted access).

4.5 CUMULATIVE IMPACTS WITH OTHER DOD ACTIONS IN JPARC

4.5.1 Past, Present, and Reasonably Foreseeable Actions

Table 4-2 lists DoD past, present and reasonably foreseeable actions within the JPARC ROI with a short description of the action. This list includes actions by several branches of the military that are similar in nature to those considered in this EIS, with a potential to expand the area of operations or increase activity in Special Use Airspace (SUA) or on the ground. Figure 4-1 illustrates the approximate locations of these other military actions in the JPARC ROI.

Table 4-2. Past, Present, and Reasonably Foreseeable DoD Actions in JPARC Region of Influence

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
A	Range Complex Training Land Upgrades, Final Finding of No Significant Impact (FONSI) and Programmatic Environmental Assessment (EA) (USARAK 2010-2)	The installation formerly known as U.S. Army Garrisons, Fort Richardson and Fort Wainwright implemented site-specific range projects in support of Training,; sustainable range planning for small arms complexes and ranges; using adaptable use zones, and proposed environmental stewardship range construction guidelines to maximize the efficiency and effectiveness of environmental review of range and training land projects. The EA concluded with a FONSI.	X	X	X
B	JPARC Master Plan	The Master Plan was a precursor to the JPARC EIS for defining military requirements with input from military stakeholders in Alaska. Input was captured through interviews with unit and exercise subject matter experts and workshops. The plan identifies both short-term and funded actions and possible long-range capabilities. Future planned actions may include augmenting LATN training and helicopter gunnery, developing urban target set and high angle mountain marksmanship range on military land and additional dry targets on non-military land.		X	X
C	Resumption of Year-Round Firing Opportunities at Fort Richardson, Alaska, EIS (USARAK 2010-1)	This action restored year-round live-firing capabilities at the installation formally known as Fort Richardson. Past restrictions caused a shortage of indirect live-fire training opportunities at Fort Richardson. The purpose of this EIS is to ensure that Army units be certified with a variety of weapons systems before they can be safely and effectively deployed. The proposed action provides for training opportunities necessary for 4th Brigade Combat Team to attain and sustain certification.	X	X	X
D	GOA Navy Training Activities Final EIS/Overseas EIS (Navy 2011) Note: The Navy is planning to prepare a supplemental EIS, based on the original GOA Navy Training Activities EIS, in the near future.	The GOA EIS/Overseas Environmental Impact Statement analyzed the potential environmental effects that may result from the United States Navy's Proposed Action and Alternatives. The proposed action and alternatives addressed ongoing naval training activities and Navy training activities for two large-scale joint force exercises, including Anti-Submarine Warfare activities and the use of active sonar. These exercises would each last up to 21 days and consist of multiple component training activities during 3 to 6 weeks annually in Temporary Maritime Activities Area or other areas of the GOA.		X	X

Table 4-2. Past, Present, and Reasonably Foreseeable DoD Actions in JPARC Region of Influence *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
E	Relocation of the ANG 176th Wing to Elmendorf AFB, Alaska, EA (Air Force 2007-1)	This EA analyzed the reassignment of the 176th Wing of the Alaska Air National Guard to Elmendorf AFB. The proposed action addressed the beddown of the 176th WG and all associated aircraft and expeditionary combat support elements at Elmendorf AFB including the placement of 12 C-130H, three HC-130N, and five HH-60G aircraft, for a total of 20 aircraft; construction of new facilities; renovation or modification of some existing facilities; replacement of support equipment; and a shift in full time and traditional Air National Guard personnel from their current assignment at Kulis ANGB to Elmendorf AFB.	X		
F	Establish the Delta MOA Complex EA (Air Force 2010)	This action resulted in recharting the Delta MOA Complex. The proposed action established connecting airspace to provide a realistic setting for MFEs. This action established several mitigation measures to reduce effects on other resources.	X	X	X
G	Grow the Army Force Structure Realignment EA (USARAK 2008-1)	The Grow the Army Force Structure Realignment EA evaluated the stationing of new units associated with Army growth and realignment in Alaska by approving a variety of projects that would provide necessary support to incoming Soldiers and their families, including additional Soldier and Family housing and support facilities, upgrading ranges to meet increased training requirements, constructing administrative and maintenance facilities, and provision of adequate maneuver and live-fire training facilities.	X	X	X
H	DTA-East Mobility and Maneuver Enhancement EA/FONSI (USARAK 2008-2)	USAG Alaska proposed to enhance the existing comprehensive training facility at DTA-East to meet the needs of a growing and changing Army and allow for sustainable use. The proposed enhancements improved existing training facilities for paratroopers to conduct additional formational tactics and provided sustainable trails and bivouac areas for unit training. The proposed action involves three enhancements: Donnelly Drop Zone Expansion, DTA-East Trail Network Upgrade, and Hardened Bivouac. The EA concluded with a FONSI.	X	X	
I	Management of Nike Site Summit, Fort Richardson EA/FONSI (USARAK 2008-3)	USAG Alaska proposed a management strategy for Nike Site Summit that addressed existing USAG Alaska military training needs, compliance with Section 106 of the National Historic Preservation Act (NHPA), human health and safety concerns, and vandalism issues associated with trespassing on Fort Richardson.	X	X	X
J	Eielson AFB Infrastructure Development in Support of RED FLAG–Alaska EA (Air Force 2007-2)	The Air Force proposed infrastructure improvements to meet mission needs of RED FLAG–Alaska exercises. This EA considered the requisite improvements programmatically and concluded that the proposed action would not result in significant impacts to the quality of the human or the natural environment.	X	X	X
K	Construction and Operation of a Railhead Facility and Truck Loading Complex, Fort Wainwright, Alaska, EA (USARAK 2007-1)	USAG Alaska proposed to construct and operate a new railhead facility and truck loading complex at Fort Wainwright. The proposed railhead facility and truck loading complex decreased deployment time to no more than 96 hours by increasing the existing train loading capacity with a location in close proximity to supply warehouses and ammunition supply points, and near existing rail lines.	X	X	X

Table 4-2. Past, Present, and Reasonably Foreseeable DoD Actions in JPARC Region of Influence *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
L	Final Environmental Assessment for the Integrated Natural Resources Management Plan EA for U.S. Army Garrison Alaska (USARAK 2007-2)	The INRMP described natural resource goals, objectives, and policies that USAG Alaska uses to manage military and non-military use of Army lands in Alaska. Development and implementation of policies and procedures described in the INRMP ensure sustainability of Army lands. The EA concluded with a FONSI.	X	X	X
M	F-22 Beddown at Elmendorf AFB Alaska, EA/FONSI (Air Force 2006-1)	This EA addressed the beddown of two F-22A operational squadrons over a period of approximately 5 years at Elmendorf AFB, including flying sorties at the base for training and deployment after beddown; constructing or remodeling facilities and infrastructure to support the F-22A Operational Wing; and implementing personnel changes to conform to the F-22A Wing requirements. The two F-22A squadrons replaced one squadron of F-15C and one squadron of F-15E aircraft designated to leave Elmendorf AFB. F-22A training flights take place on Alaskan MOAs, ATCAA, MTRs, and ranges where F-15C and F-15E aircraft previously trained.	X	X	
N	EA, Conversion of the Airborne Task Force to an Airborne Brigade Combat Team, Fort Richardson, Alaska (USARAK 2005-1)	This action involved the stationing of approximately 2,400 additional personnel at the installation formerly known as Fort Richardson and the additional construction of new facilities to support the stationing increase. Airborne unit training activities increased at Fort Richardson, Fort Wainwright, TFTA and YTA, and DTA. Maneuver impact miles and maneuver training space increased by 200 percent with the conversion of the 1-501st ATF to an Airborne BCT. The EA concluded with a FONSI.	X		
O	Integrated Training Area Management Plan USARAK EA (USARAK 2005-2)	USARAK proposed a management plan using its Integrated Training Area Management (ITAM) program for a systematic approach to maintaining and improving its range and training land infrastructure. The management plan included use of standard operating procedures and best management practices for all ITAM component programs and projects to provide consistency among management approaches, increase oversight, and streamline processes and procedures to improve ITAM program efficiency. The management plan allows ITAM to more easily predict possible impacts of projects and determine efficacy of project procedures. Project-specific assessments can tier from this EA by focusing on project-specific local conditions and impacts.		X	X
P	Transformation of USARAK Final EIS (USARAK 2004-1)	This EIS addressed the transformation of the 172d Infantry Brigade in Alaska into Stryker Brigade Combat Team. This action addressed the change in training needed from mostly pedestrian to heavy-wheeled-vehicle activities in training areas.	X		
Q	C-17 Beddown Elmendorf AFB, Alaska, EA (Air Force 2004-1)	The proposed action addressed the replacement of the existing C-130 cargo aircraft fleet with eight new C-17 aircraft at the Elmendorf AFB, Alaska. The C-130 aircraft departed EAFB in 2006 and the C-17 aircraft arrived in 2007. The proposed action consisted of routine aircraft operations in the vicinity of EAFB, the construction and use of support facilities on EAFB, and an increase in the number of people needed to support all EAFB mission-related activities. The action included phased development of new facilities to minimize impacts to normal base operations.	X		

Table 4-2. Past, Present, and Reasonably Foreseeable DoD Actions in JPARC Region of Influence *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
R	Alaska Army Lands Withdrawal Renewal Final Legislative EIS (USARAK 1999-1)	The Department of the Army determined there was a continuing military need for the use of Alaska lands now withdrawn from public use under the Military Lands Withdrawal Act and requested the renewal of previously withdrawn land of the Fort Wainwright Yukon Training Area, the Fort Greely West Training Area, and the Fort Greely East Training Area (each greater than 5,000 acres) and continued use for military purposes through new legislation.	X		
S	Construct a CALFEX Range Facility at Fort Greely, Alaska (USARAK 1999-2)	USARAK proposed to construct and utilize a simulated fixed fighting position similar to fire bases utilized in Southeast Asia. The CALFEX facility consists of approximately 11 one- and two-story prefabricated structures fortified with sandbags. The purpose of this CALFEX facility is to provide year-round, realistic joint combined arms live-fire training for Soldiers.	X		
T	Final Alaska MOA EIS (Air Force 1997-1)	The Air Force prepared an EIS evaluating the potential environmental effects of restructuring and using Special Use Airspace in Alaska for flight training and exercises. The purpose of the proposed action was to restructure and upgrade some MOAs in Alaska. The Record of Decision (ROD) included mitigations that are part of the existing operational parameters for several MOAs in the JPARC ROI.	X		
U	F-22 Plus-Up EA Joint Base Elmendorf-Richardson, Alaska (Air Force 2011-1)	A 2006 decision approved beddown of a second F-22 operational wing at Elmendorf AFB, 42 of the 60 F-15 primary aircraft assigned to Elmendorf AFB were replaced by 36 F-22 primary and four backup aircraft. Subsequently, the remaining F-15C squadron of 18 primary aircraft was reassigned from Elmendorf AFB, leaving what is now JBER with 36 F-22 primary aircraft. The proposed beddown added six primary aircraft and one backup aircraft to JBER to meet Air Force mission requirements. The JBER F-22 operational wing would have a total of 47 F-22 aircraft. The additional F-22 aircraft train in existing Alaska training airspace and ranges used by existing F-22 aircraft. An additional 103 personnel arrived at JBER.	X	X	
V	Stationing and Training of Increased Aviation Assets Within USARAK Final EIS (USARAK 2009-1)	Following this EIS, the U.S. Army, Alaska implemented the reorganization and augmentation of its aviation assets in Alaska as an Aviation Task Force (ATF). The ATF is permanently stationed at Fort Wainwright. New facilities provided for approximately 2,005 Soldiers, family members, and civilian support personnel. The EIS and ROD were completed in 2009.	X	X	X
W	U.S. Army Alaska Battle Area Complex (BAX) and a Combined Arms Collective Training Facility (CACTF), Construction and Operation (USARAK 2006-1)	The Army completed an EIS and ROD for construction and operation of a BAX and CACTF to be located at Eddy Drop Zone. The ROD was issued in July 2006. The Eddy site is located almost immediately east of Fort Greely and southeast of Delta Junction. The location is predominately upland habitat but the area where the BAX would be situated also lies within the 100-year floodplain of Jarvis Creek. The CACTF site rests about four miles from Delta Junction, and the BAX approximately five miles. The design of the BAX orients weapons firing to the south, away from Delta Junction.	X	X	X

Table 4-2. Past, Present, and Reasonably Foreseeable DoD Actions in JPARC Region of Influence *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
X	Naval Special Warfare Maritime Training Activities – Kodiak Island	Navy Special Warfare Command currently conducts training exercises on and around Kodiak Island. Training consists of SEAL Qualification Training approximately six times per year, SEAL Team training approximately twice per year; and parachute operations once every two years. The USFWS concluded that the exercises are not likely to adversely affect listed species or adversely modify critical habitat.	X	X	X
Y	Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar	Final Supplemental EIS for the employment of the SURTASS LFA system was issued in April 2007, and the ROD was issued in August 2007 by the Navy. Under the action, a maximum of four systems would be deployed in the Pacific-Indian ocean area and in the Atlantic-Mediterranean area. Of an estimated maximum 294 underway days per year, the SURTASS LFA sonar would be operated in the active mode about 240 days.	X	X	X
Z	C-17 Training Areas Final EA Elmendorf AFB, Alaska November 2005	C-17 training includes operations in Alaskan Special Use Airspace (SUA). The project also includes upgrading Runway 07/25 at Allen Army Airfield, frequent use of the runway as a C-17 assault landing zone, and frequent use of five existing drop zones for C-17 training. C-17 aircraft are included as users of the proposed Delta MOA.	X	X	
A1	Modification of Military Training Routes (MTRs) Draft EA June 2005	The Air Force modified existing MTRs within the state of Alaska to better connect the MTRs with existing SUA. These changed MTRs are used by aircraft with low level navigation missions. MFE training in the proposed Delta MOA includes low-level flight in the Birch and Buffalo MOAs.	X	X	
B1	Eielson BRAC projects Identified as a BRAC action by BRAC Act of 2005	This project removed 354th Fighter Wing assigned A-10 aircraft from Eielson AFB. An Aggressor Squadron of F-16s replaced operational F-16s at Eielson AFB. The Aggressor Squadron F-16s participate in MFE activity in this EA.	X	X	
C1	F-35 Beddown at Eielson	Basing locations for F-35 operational aircraft are being evaluated as part of a nationwide EIS. One alternative location under consideration is Eielson AFB. If Eielson were selected as an F-35 operational location, there would be construction at the base and training in the airspace. F-35s, either locally or remotely based, are assumed to participate in MFE training in this Delta MOA EA. The Air Force preferred alternatives for initial basing of the F-35A operational squadrons are Hill AFB, Utah and Burlington AGS, Vermont. Eielson AFB is not at this time included in the beddown alternatives being addressed in an environmental analyses for the initial F-35A operational squadrons.			X

Key: AFB=Air Force Base; AGS=Air Guard Station; ANG=Air National Guard; ANGB=Air National Guard Base; ATCAA=Air Traffic Control Assigned Airspace; BAX=Battle Area Complex; BRAC=Base Realignment and Closure; BCT=BRAC Cleanup Team; C=Celsius; CALFEX=Combined Arms Live-Fire Exercises; CACTF=Combined Arms Collective Training Facility; DTA=Donnelly Training Area; EA=Environmental Assessment; EIAP=Environmental Impact Analysis Process; EIS=Environmental Impact Statement; FRA=Fort Richardson; GOA=Gulf of Alaska; INRMP=Integrated Natural Resources Management Plan; ITAM=Integrated Training Area Management; JBER=Joint Base Elmendorf Richardson; Combination of Elmendorf AFB and Fort Richardson; JPARC=Joint Pacific Alaska Range Complex; MFE=major flying exercise; MOA=Military Operations Area; MTR=Military Training Route; NHPA=National Historic Preservation Act; ROD=Record of Decision; SBCT=Stryker Brigade Combat Team; SUA=Special Use Airspace; SURTASS LFA=Surveillance Towed Array Sensor System Low Frequency; TFTA=Tanana Flats Training Area; USAG =U.S. Army Garrison; USARAK=U.S. Army Alaska; USFWS=U.S. Fish and Wildlife Service; YTA=Yukon Training Area.

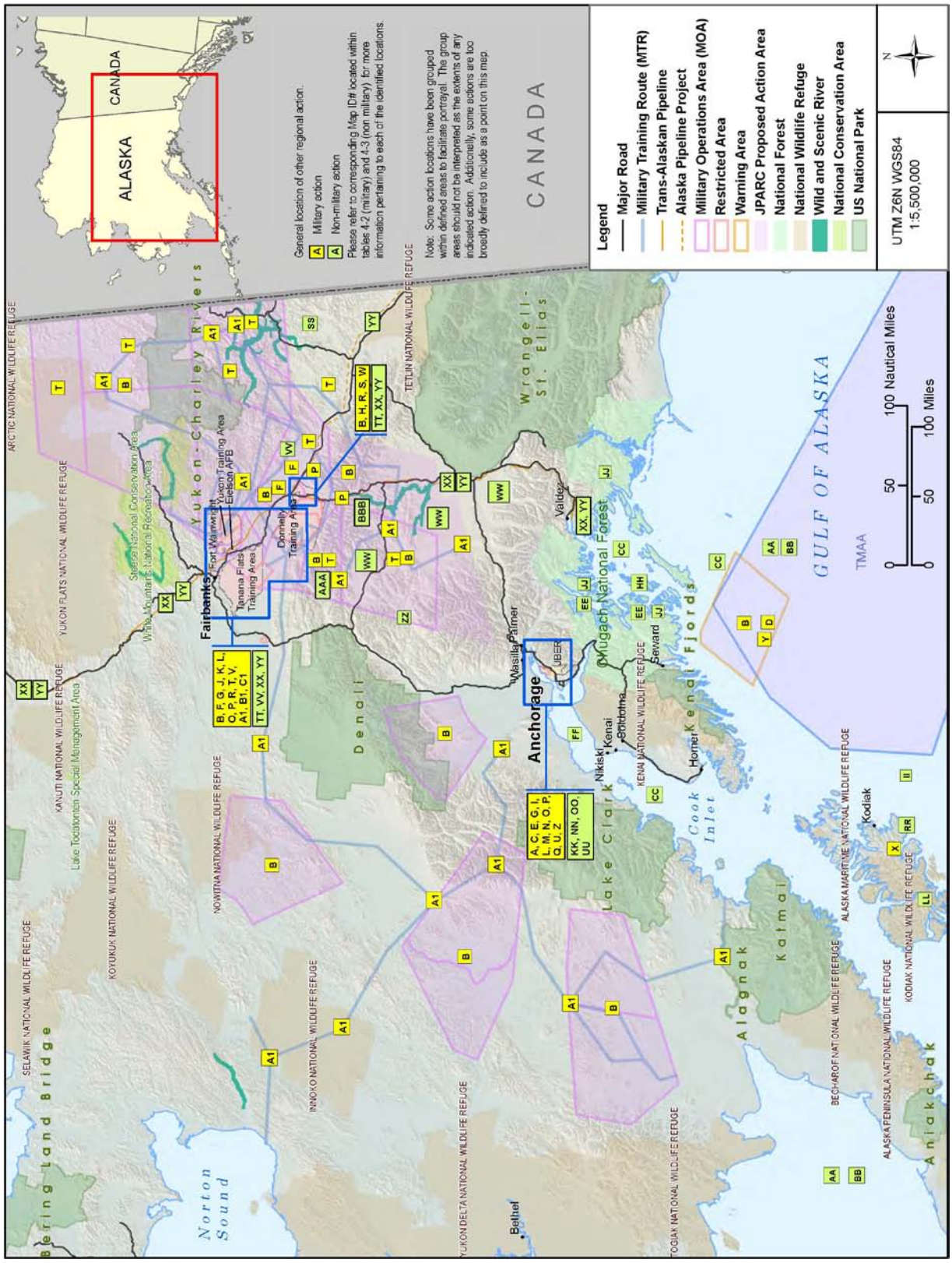

Figure 4-1. Locations of Other DoD and Non-military Actions in the JPARC Region of Influence

4.6 CUMULATIVE IMPACTS WITH OTHER REGIONAL ACTIONS

4.6.1 Past, Present, and Reasonably Foreseeable Actions in the Larger Region

Table 4-3 lists past, present, and reasonably foreseeable non-military actions in the JPARC ROI. The approximate location of the actions is shown in Figure 4-1, keyed to the location ID number in Table 4-3. Several of the non-military actions involve planning and management of lands under the jurisdiction of a State or Federal agency. These agencies are responsible for use and development in order to sustain resources and promote legislated priorities of the managing agency. In addition to these actions, the Matanuska-Susitna Valley and Fairbanks-Delta Junction areas are among the fastest growing areas in Alaska. Natural growth is increasing the level of development in these areas and the presence of people in the wider region is increasing participation levels of activities in remote areas, such as cabin use and homesteading, hunting, fishing, subsistence harvesting, general aviation flights, mountaineering and trekking, ecotourism, and winter motorized access. Also expanding is the area of influence for extraction, development, and production of energy and mineral resources to meet national and global demands. These activities will continue to occur within current regulatory frameworks, and within the scope of plans and requirements of Federal and State land managers.

Table 4-3. Past, Present, and Reasonably Foreseeable Actions in the Larger Region

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
AA	Alaska Groundfish Harvest Specifications EIS	This NMFS proposal established harvest strategies for the Bering Sea and Aleutian Islands and GOA groundfish fisheries. Final EIS Record of Decision (ROD) signed in 2007.	X	X	X
BB	Alaska Groundfish Fisheries EIS	The NMFS EIS addressed implementation of Fishery Management Plans for groundfish fishery of the GOA and the groundfish fishery of the Bering Sea and Aleutian Islands Area, North Pacific Fishery Management Council. Final Supplemental EIS ROD signed 2004.	X	X	X
CC	Alaska Predator Ecosystem Experiment (APEX)	The APEX multi-agency pilot project was designed to investigate prey (forage fish) distribution, abundance, and availability within the Prince William Sound, Cook Inlet, and northern Gulf of Alaska. The project examined and documented the interactions of seabirds and their prey and observable changes.	X		
DD	Amendments to the Alaska Coastal Management Program, Approval, Implementation and Funding, U.S. Army USACE 404 Permit, Alaska	This action implemented new coastal management regulations with approval by the Office of Ocean Coastal Resource Management.	X	X	X
EE	Commercially Guided Helicopter Skiing on the Kenai, Peninsula EIS	This USFS decision allowed guided heli-skiing operations on portions of the Glacier and Seward Ranger Districts, Chugach National Forest, Glacier and Seward Ranger Districts, Kenai Peninsula. The Final ROD was signed in 2002.	X	X	
FF	Cook Inlet Beluga Whale Subsistence Harvest- Supplemental EIS	The 2008 ROD for this EIS implemented a long-term plan to manage subsistence harvests of the Cook Inlet, Alaska, beluga whale stock.	X	X	X

Table 4-3. Past, Present, and Reasonably Foreseeable Actions in the Larger Region *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
GG	EFH Identification and Conservation, Implementation, North Pacific Fishery Management Council, Magnuson-Stevens Fishery Conservation and Management Act of 1976	Under this act, the NMFS and regional Fishery Management Councils (Councils) identified fishery management plans to minimize the adverse effects of fishing on waters and substrate necessary to fish for fish spawning, breeding, feeding, or growth to maturity.	X	X	X
HH	Exxon Valdez Oil Spill Restoration Plan-Draft Supplemental EIS	This 2011 draft EIS is evaluating a proposal to narrow and refine the scope of restoration efforts for the Exxon Valdez oil spill to five defined restoration categories: herring; lingering oil; long-term monitoring of marine conditions; harbor protection and marine restoration; and habitat acquisition and protection.			X
II	Gulf APEX Predator-Prey (GAP) Project	Issued a final report in 2005; GAP's primary goal is to document trophic relationships between Steller sea lions, their prey, predators, and potential competitors in waters near Kodiak Island, an area of continued sea lion declines and extensive commercial fishing.	X		
JJ	Helicopter Access to Conduct Forest Inventory and Analysis (FIA) in Wilderness FEIS	The USDA Forest Service 2007 ROD allowed the use of helicopters to access 540 FIA plots within the wilderness areas of the Tongass National Forest and a wilderness study area on the Chugach National Forest. Significant issues included effects to wilderness character, wildlife, and employee safety.	X	X	X
KK	Knik Arm Crossing (KAC)	The 2010 ROD approved the proposed KAC, an 8,000 to 14,000 feet long bridge by the Knik Arm Bridge and Toll Authority to enhance access between the Municipality of Anchorage and the Matanuska-Susitna Borough to the northwest. This effort includes a request for take of marine mammals incidental to construction over the course of five construction seasons (spring 2013 through autumn 2017).			X
LL	Kodiak National Wildlife Refuge, Draft Revised Comprehensive Conservation Plan, Implementation	A 2006 USFWS ROD to implement this plan provides management direction for activities and uses of Kodiak Refuge, goals and objectives for refuge programs, and compatibility determinations for the current uses of the Kodiak National Wildlife Refuge.	X	X	X

Table 4-3. Past, Present, and Reasonably Foreseeable Actions in the Larger Region *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
MM	Port MacKenzie Development	Matanuska-Susitna Borough is planning to build a deep-water dock facility in the Point MacKenzie area, to facilitate economic development in the borough, for about 30 years, in addition to a barge dock completed in 2000, and a deep-water dock completed in 2005. These actions increase vessel traffic in the Anchorage area, and can contribute to economic and land development activity.	X	X	X
NN	Port of Anchorage Expansion	The Port of Anchorage accommodates approximately 75 percent of goods shipped into Alaska. The Port is planning a major expansion of its marine terminal capacity, including road and rail service expansion and redevelopment of the marine terminal. The expansion project could potentially increase vessel traffic to and from the GOA.		X	X
OO	Ferry Service for Knik Arm	Matanuska-Susitna Borough is developing a ferry link between Port MacKenzie and the Port of Anchorage with service to beginning in 2010. While not directly influencing the GOA, the project could increase vessel traffic in the Cook Inlet/Knik Arm area.			X
PP	Ring of Fire Resource Management Plan, Implementation RMP/EIS	The BLM prepared an RMP/EIS and decision in 2008, to provide direction for managing their public lands within the Ring of Fire planning area boundaries.	X	X	X
QQ	Other Potential Coastal Development	Various commercial, industrial, transportation, and residential development is possible in the coastal areas of Alaska. Mat Su Borough, for example, has discussed building a road/rail connection to Willow; a 200-megawatt (MW) gas-fired power plant has been discussed for Matanuska-Susitna Borough; residential development has been proposed near various lakes in Mat Su; and assorted growth and development proposals are regularly raised for the greater Anchorage area. These potential coastal developments may gradually reduce terrestrial habitat acreage and introduce pollutants that are associated with urbanization into the air and water.			X
RR	Alaska Aerospace Corporation Space Vehicle and Missile Launch Operations at Kodiak Launch Complex	Alaska Aerospace Corporation launches space launch vehicles, long-range ballistic target missiles, and other smaller missile systems at the Kodiak Launch Complex. Alaska Aerospace Corporation is seeking a marine mammal incidental take permit for 2011 to 2016.		X	X
SS	The Eastern Interior RMP/EIS - In Progress	The BLM is developing a RMP for the Eastern Interior Planning Area. The Eastern Interior RMP will provide future direction for 6.7 million acres of public land including the White Mountains National Recreation Area, the Steese National Conservation Area, and the Fortymile area.			X

Table 4-3. Past, Present, and Reasonably Foreseeable Actions in the Larger Region *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
TT	Northern Rail Extension EIS	The Northern Rail Extension involves the construction and operation of approximately 80 miles of new rail line from North Pole, Alaska, to Delta Junction, Alaska (see Figure 1-1 for a map of the region). The rail extension would begin at the east end of the Chena River Overflow Bridge—north of Eielson AFB—and end at the southern side of Delta Junction. The project includes new structures, such as bridges, a passenger facility, communications towers, access roads for rail line construction and operations, and sidings.		X	X
UU	Natural Gas Pipeline - In Progress	Alaska is pursuing the construction of a natural gas pipeline extension in the Anchorage area.			X
VV	Eastern Tanana Area Plan (ETAP) - In Progress	The Alaska Department of Natural Resources has initiated the development of the Eastern Tanana Area Plan (ETAP). The ETAP will revise/update the existing plan to account for changes in land ownership to reflect the current and anticipated economic, social and environmental conditions in the area and to provide a sufficient land-base for the development and conservation of the state's natural resources.			X
WW	East Alaska Resource Management Plan	This ROD approves the BLM's proposal to manage the public lands within the Glennallen Field Office's jurisdiction as presented in the RMP, as Alternative D in the June 2006 Proposed East Alaska RMP and Final EIS. Of the approximately 30,908,000 acres within the planning area, decisions in the approved plan will apply to 7,056,000 acres, classified as BLM, Native-selected, dual-selected, mineral estate, State lands, Native lands, National Park Service lands, USDA Forest Service, and private lands. The plan provides for establishing off-road vehicle use trails, biomass harvesting and development of mining claims, following provisions as set out in the approved plan. The RMP is expected to complete implementation in 2012.		X	X
XX	The Trans-Alaska Pipeline	The Trans-Alaska Pipeline System was constructed to move crude oil from Alaska's North Slope to Port Valdez on Alaska's Prince William Sound, Construction of the 800-mile pipeline was completed in 1977 and traverses the JPARC ROI. The Trans-Alaska Pipeline System carries approximately 15 percent of the nation's domestic oil production.	X	X	X
YY	The Alaskan Pipeline Project	The TransCanada and ExxonMobil Alaska Pipeline Project proposes to design, permit and construct a new natural gas pipeline system beginning near Alaska's Prudhoe Bay field and following one of two alternative routes. The proposed alignments traverse the JPARC ROI. Submittal of documents and other environmental findings is expected in late 2012.		X	X

Table 4-3. Past, Present, and Reasonably Foreseeable Actions in the Larger Region *(Continued)*

Key on Figure 4-1	Project	Description	Timeframe		
			Past	Present	Future
ZZ	Susitna-Watana Project	The proposed Susitna-Watana hydroelectric project is located in the Southcentral region of Alaska, approximately 120 miles north-northeast of Anchorage and 110 miles south-southwest of Fairbanks. The Southcentral region of the state is geographically bounded by the Alaska Range to the north and west, the Wrangell Mountains to the east, and the Talkeetna Mountains to the south. This region encompasses 86,000 square miles of the total 586,000 square miles of the state. As proposed, the project would include construction of a 2,700-foot-long and 700-foot-high dam, 39-mile-long reservoir and power plant on the Susitna River starting at river mile (RM) 184, approximately 34 miles upstream of Devils Canyon. The dam site would have temporary facilities for construction workers (up to 1,000 persons), permanent facilities for a small permanent resident crew to operate the dam, and a 7,000-foot runway. Transmission lines connecting into the existing Railbelt transmission system, an access road, railhead facility, and overhead transmission lines would also be constructed. The project includes development of public recreational facilities at the reservoir and is expected to attract and afford access into the area for multiple purposes.			X
AAA	Denali Air Special Recreational Use Permit	Denali Air is requesting to be able to conduct scenic glacier landings by fixed-wing aircraft near Mount Deborah on portions of the Yanert and Gillian Glaciers, with up to three departures daily from May 10 to October 10. Currently, BLM is conducting an environmental assessment.			X
BBB	Pure Nickel Mineral Exploration and Mining Operations	Active mineral exploration on claims by Pure Nickel's Man Alaska Project (2009-2014). These involve 240 miles of claims on State land called the Denali Block as well as some on the BLM land in the Amphitheater Mountains north of the Denali Highway under Fox 3 MOA. New production could involve open pit or underground mining. Both methods involve waste rock dumps, tailing stacks and ponds, toxic dust from ore trucks, mine drainage, transmission lines, and access roads.		X	X

Key: AFB=Air Force Base; ACMP=Alaska Coastal Management Program; APEX=Alaska Predator Ecosystem Experiment; BLM=Bureau of Land Management; CFR=Code of Federal Register; EFH=Essential Fish Habitat; EIS=Environmental Impact Statement; ETAP=Eastern Tanana Area Plan; FIA=forest inventory and analysis; FEIS=Final Environmental Impact Statement; FERC=Federal Energy Regulatory Commission; KAC=Knik Arm Crossing; LNG=Liquefied Natural Gas; MW=Megawatt; NMFS=National Marine Fisheries Service; NOAA=National Oceanic and Atmospheric Administration; NRE=Northern Rail Extension; OCRM=Ocean and Coastal Resource Management; PRMP/FEIS=Proposed Resource Management Plan/Final Environmental Impact Statement; RM=river mile; RMP=Resource Management Plan; ROD=Record of Decision; ROI=region of influence; TBAP=Tanana Basin Area Plan; USDA=U.S. Department of Agriculture; USFS=U.S. Forest Service; USFWS=U.S. Fish and Wildlife Service.

4.7 CUMULATIVE IMPACTS WITH OTHER EXTRA-REGIONAL ACTIONS

The only resource with potential for extra-regional cumulative impacts is air quality. The potential effects of proposed greenhouse gas (GHG) emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact on global climate change would only occur when proposed GHG emissions combine with GHG emissions from other man-made activities on a global (extra-regional) scale.

Currently, there are no formally adopted or published NEPA thresholds of significance for GHG emissions. Therefore, this EIS presents the GHG emissions that would take place as a result of the proposed actions. Sections 3.1.4, 3.2.4, 3.3.4, 3.4.4, 3.5.4, and 3.6.4 and Appendix F, *Air Quality*, of this EIS present estimates, and subsequent calculations, of GHG emissions that would occur from each project action alternative. GHG emissions from the project alternatives are significantly lower than regional and global GHG emissions; thus, there would be no significant impact from increased cumulative GHG emissions from the project action alternatives and other DoD actions.

4.8 EFFECTS OF PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

The additive or interactive effects of the 12 actions proposed in this EIS, in aggregate, when considered together with the effects of other past, present, and reasonably foreseeable future actions in the greater JPARC region, are presented below by resource category.

4.8.1 Airspace Management and Use

Aggregate Impacts of Multiple JPARC Proposed Actions. Both the representative baseline use of the existing SUA and the projected use of the existing and proposed airspace have considered those past, present, and future actions that include airspace actions or any increase/reduction in military aircraft operations. For instance, changes in aircraft sortie-operations associated with the Joint Base Elmendorf-Richardson (JBER) F-22 Beddown and Plus Up Environmental Assessments (EA), the JBER C-17 Beddown and Training EAs, and the U.S. Army Alaska (USARAK) Increased Aviation Assets EIS were reflected in the overall baseline and estimated airspace use projections, as appropriate. Airspace actions implemented as a result of the Alaska MOA EIS and the Delta MOA EA were incorporated as part of the existing Alaska SUA descriptions. Likewise, aircraft operations reflected in *The Gulf of Alaska Navy Training Activities Final Environmental Impact Statement/Overseas Environmental Impact Statement* (*GOA EIS/OEIS*) were considered in examining the potential impacts of the projected Air Force sortie-operations for proposed missile live-fire activities within the Temporary Maritime Activities Area (TMAA) and Warning Area 612 (W-612). As noted in Section 3.1.1.1, the proposed airspace actions would not affect or be affected by the structure and use of the existing Military Training Routes (MTRs) and LATN area shown in Figure 4-1 and/or D-2 that were previously assessed and approved for tactical training activities at lower altitudes than those proposed for the Fox 3 and Paxon MOAs. The current/future uses of the MTRs and LATN areas would not have any cumulative impacts on the existing and proposed JPARC airspace. Therefore, the airspace and aircraft actions assessed in those past and present NEPA studies were incorporated, as appropriate, when the impact analysis and mitigations for each of the JPARC proposed actions.

There may be a greater potential for overall significant cumulative impacts during those daily timeframes when all existing and proposed airspace is activated by the Air Force and USARAK for their respective training mission requirements. Doing so could result in minimal to significant impacts on Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) air traffic operating through the region, depending on the locations/densities of both military and commercial/general aviation operations during those

daily/seasonal timeframes when all SUA would be activated. The greater potential for cumulative impacts would be the manner in which the SUA is activated on a daily basis by the Air Force and USARAK in support of their respective training mission requirements. Analysis of each JPARC proposed action noted the potential for minimal to significant impacts on IFR and VFR air traffic, depending on the locations/densities of both military and commercial/general aviation operations during those daily/seasonal timeframes in which the SUA would be activated. The higher-density major flying exercise (MFE) operations over each 10- to 15-day flight period (60-day maximum per year) in the proposed Fox 3 and Paxon MOAs or Air Traffic Control Assigned Airspaces (ATCAAs) and their low/high-altitude sectors would have the greater potential to affect the Federal airway/jet route system and VFR aircraft use of this airspace. As noted in Chapter 3.0, IFR air traffic may have to be rerouted around this active airspace, as needed, and VFR pilots may want to delay or reroute their flights if they do not want to transit through the MOAs when the lower-altitude sectors are in use.

Concurrent use of either or all of the restricted airspace proposed for the realistic live-fire deliveries (expanded R-2202), the BAX restricted area, and the DMPTR (expanded R-2205) may impose greater impacts on IFR and VFR air traffic during those time periods MFEs are also in progress in the other SUA. The combination of the active MOAs/ATCAAs and the restricted airspace may limit air traffic control (ATC) options for transiting IFR en route and airport air traffic through this airspace. Activation of the lower MOA altitudes in which VFR aircraft normally operate, coupled with the prohibitions of flying through active restricted areas, may inhibit VFR flights through those commonly used areas/flyways.

Each of the proposed UAV corridors would encompass restricted airspace, which, depending on the corridor and altitude layer being activated, could restrict IFR and VFR aircraft from transiting through this affected airspace. The potential impacts of each corridor would differ with their location relative to Federal airways/jet routes and common VFR flight routes. If multiple corridors are activated simultaneously to permit UAV transit between the launch points and different range training areas, this may further restrict nonparticipating aircraft from transiting through the affected areas. The concurrent use of one or more corridors with the other proposed SUA during MFEs and other higher-density routine training periods would have a greater potential for significant impacts on IFR and VFR flights throughout the region. The more-distant GOA airspace in which the proposed missile live-fire operations are proposed would not likely contribute to any cumulative airspace impacts.

It must again be emphasized that the extent of any individual or cumulative impacts would depend on the daily/seasonal times of SUA use, the altitude sectors being activated during those times, and the number of IFR or VFR flights operating within those areas and timeframes. Section 3.1.1.1 and Appendix D, *Airspace Management*, identify the average daily IFR flights on the affected Federal airways and jet routes and the reported annual public airfield operations. While these data provide a general basis for the amount of air traffic potentially affected by the individual or multiple proposed JPARC airspace uses, it cannot reasonably account for the number of flights that could be potentially impacted, any flight delays, or the additional distances flown and fuel usage if rerouting becomes necessary.

Overall, there are many variables to be considered in determining if and to what extent the JPARC airspace proposals may have cumulative impacts on all airspace uses in this region. Potential impacts on IFR air traffic and ATC system capabilities would be examined in depth by the Federal Aviation Administration (FAA) in the aeronautical study of each airspace proposal. Potential impacts on the general aviation community would be further addressed by the military with the Aircraft Owners and Pilots Association, Alaska Airmen's Association, and other aviation concerns as part of an effort to determine what measures may be required to best accommodate all Alaska airspace uses to the maximum extent possible.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. Future flight training activities and airspace uses in Alaska over the next 20 to 25 years could include any aircraft type, such as the F-35, in the inventory of the United States and its allies. Such aircraft may be a participant in MFEs or transient routine training activities. The potential for cumulative significant impacts would be the same as discussed above and in the Chapter 3.0 Airspace Management analyses during those periods when all Air Force and USARAK SUA is activated for respective or joint operations as this could greatly limit or restrict VFR aircraft from operating throughout those areas more commonly flown. Any future basing of a new aircraft type in Alaska, or the relocation of aircraft (e.g., the F-16s from Eielson Air Force Base (AFB) to JBER, as is now being considered by the Air Force) would require that the appropriate environmental impact analysis processes be completed to include the potential impacts of such actions on all military and civil aviation airspace uses.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. No other DoD or non-military actions have been identified at this time for the JPARC region that would result in any significant ground safety risks beyond what is discussed in this EIS or that would increase any potential for cumulative impacts. In any event, strict procedures and controls would be put in place to safely manage and protect the areas in which any hazardous activity is performed.

4.8.2 Noise

Aggregate Impacts of Multiple JPARC Proposed Actions. Cumulative noise impacts would occur in areas where the 12 component JPARC proposed actions overlap, but would not be expected to be significant. The combined impact of implementing JPARC actions together would not cause a significant impact that is not already identified in Chapter 3.0 for each of the individual proposals. Impacts associated with areas of overlap are described below.

Cumulative impacts could result from the proposed modifications to Fox 3/Paxon airspace areas in combination with proposed NJT. Increases in late-night flying (after 10:00 p.m.) proposed under NJT would increase the time-averaged subsonic noise level (L_{dnmr}) and time-averaged munitions noise level (CDNL) in affected airspace areas by approximately 1 decibel (dB). If this increase were to occur in addition to changes in noise level associated with the Fox 3/Paxon airspace modifications, minimal additional annoyance to persons beneath the airspace areas would be expected. NJT would not increase the number of sortie-operations flown or any aspect of the flying operations other than the time of day in which they occurred. The 1-dB increase would not result in noise levels beneath the Fox 3/Paxon airspace areas greater than 55 dB L_{dnmr} or 62 dB CDNL under any of the Fox 3/Paxon action alternatives.

Establishment and use of UAV restricted area access corridors would overlap spatially with NJT. However, noise impacts associated with UAV operations would be minimal and would not be expected to be significant either alone or in combination with other proposed actions.

JPARC proposed actions that involve munitions use include RLOD, BAX Restricted Airspace Expansion, Expansion of R-2205, the JAGIC, and live fire of AIM-9 and AIM-120 missiles, which would not individually or cumulatively result in significant noise impacts. Implementation of these actions alone or in combination would not result in noise levels exceeding 62 dB CDNL in areas not owned by DoD. Peak noise levels would not increase in instances where two JPARC proposed actions occurred in the same area.

Noise impacts associated with construction and tactical vehicle maneuvering would not be expected to be significant either alone or in combination with other JPARC component proposed actions. Construction activities and vehicle maneuvering result in noise-level increases that are limited in terms of duration and area affected.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. The creation of SUA for military operations over time has provided a means to share the national airspace assets with the civilian community, and to provide for the safety of all users. It has also directed the noise resulting from military training to accumulate over certain areas. Overall, the noise levels in underlying areas remains relatively low and compatible with most underlying uses. The Air Force has developed procedures to avoid the most sensitive underlying areas in order to maintain the minimum possible noise levels without unduly compromising the quality of training. Nonetheless, in some areas, the soundscape has progressively changed through the introduction of man-made sources of noise (not just from military overflight). The military will continue to be sensitive to the impact of their activities and continue to refine procedures that will maintain acceptable conditions for affected persons and resources (including wildlife and specially designated lands).

Representative baseline noise conditions include currently ongoing DoD aircraft operations and munitions usage, as well as proposed changes in operations for which NEPA analysis has been completed. Changes in noise levels associated with the proposed actions are added to representative baseline noise conditions. Therefore, overall noise impacts presented in Chapter 3.0 reflect cumulative impacts of the proposed actions with ongoing or planned actions. DoD actions that have not yet undergone NEPA analysis, and which are not reflected in noise-level calculations, include actions described in long-term planning documents such as the USARAK Range and Training Land Program Development Plan. Actions that may or may not be taken based on the findings of such plans are not yet ripe for NEPA analysis, and it is not possible at this time to determine the level of noise impacts associated with these potential actions. Similarly, if F-35 aircraft were to be bedded down at an installation in Alaska, noise impacts would be dependent on the number of aircraft and how those aircraft would operate. It is likely that noise impacts associated with F-35 aircraft operations would be significant in nature, but it is impossible to know the extent of impacts at this time.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. There are no known civilian or joint-DoD-civilian past, present, or reasonably foreseeable actions that would result in significant noise impacts in combination with the proposed actions, although several non-DoD actions could result in increased noise levels. For example, the proposed Northern Rail Extension would introduce additional noise to areas affected by the proposed actions both during construction and once rail operation began. However, cumulative noise impacts would not be expected to be significant. Future civilian projects proposed in long-term planning documents such as the Tanana Basin Area Plan are not yet sufficiently well-defined to allow accurate prediction of the level of cumulative noise impacts when combined with the proposed actions.

4.8.3 Safety

FLIGHT SAFETY

Aggregate Impacts of Multiple JPARC Proposed Actions. Analyses of the cumulative impacts associated with flight safety risks, to include aircraft mishaps, near misses and midair collisions, and bird/wildlife-aircraft strikes, have considered the extent to which the proposed JPARC airspace actions and projected aircraft operations could increase any potential for these risks. As noted in Section 4.8.1, Airspace Management and Use, airspace actions and increased/reduced aircraft operations associated with other past, present, and future NEPA actions were already incorporated in the representative baseline and projected sortie-operations. Therefore, the potential for any cumulative flight safety impacts considered the concurrent activation and uses of the multiple proposed airspace actions.

The potential for aircraft mishaps and near misses/midair collisions can vary, depending on the locations/areas in which military aircraft flights are being conducted and the amount of military and other nonparticipating aircraft operating within the same general area. For all the airspace proposals, it was

noted that there would not be any significant increase in flight operations beyond those representative baseline levels shown in Chapters 2.0–3.0 and Appendix D, *Airspace Management*. If individual base/unit flight training missions required the separate, independent use of multiple existing/proposed SUA areas, then aircraft sortie-operations within each of those areas would presumably remain at representative baseline levels. Therefore, this should not theoretically increase the mishap potential, based on aircraft mishap rates per 100,000 flying hours. The concurrent but separate use of the individual SUA areas by Air Force and USARAK aircraft should not result in cumulative flight safety impacts.

The greater potential for bird-aircraft strikes is within lower altitudes within the airfield environment and in other areas where low-altitude flights are being conducted. The lower altitudes proposed for use within each of the JPARC airspace actions could increase the risk of bird/wildlife strikes in those areas where the different species are known to exist during spring/summer/fall seasonal periods. As discussed above, the concurrent but separate use of the individual SUA areas should not result in cumulative flight safety risks or impacts associated with bird/wildlife strikes.

The programs and procedures that both the Air Force and USARAK have in place for preventing aircraft mishaps, maintaining situational awareness of other aircraft operating within the same areas, and keeping aircrews informed of potential bird activities and bird-aircraft strike hazards would continue to be effective in minimizing flight safety risks within individual and multiple SUA areas.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. The potential for cumulative significant impacts would be the same as discussed above and in the Chapter 3.0 Flight Safety analyses during those periods when all Air Force and USARAK SUA is activated for respective or joint operations. No other significant DoD actions have been identified at this time that would result in any increased flight risks. Any future basing of a new aircraft type in Alaska, or the relocation of aircraft (e.g., F-16s from Eielson AFB to JBER), would require that the appropriate environmental impact analysis processes be completed to include the potential impacts of such actions on all military and civil aviation airspace uses.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. No other DoD or non-military airspace actions or aircraft operations have been identified for the JPARC region of that would result in any significant increase in flight safety risks beyond what is discussed in this EIS for future civil aviation growth in Alaska, to include aviation activities supporting the Susitna-Watana hydroelectric project, Denali Air Special Recreational Use, Pure Nickel Mineral Exploration and Mining Operations, or such activities. Any greater potential for aircraft mishaps and near misses/midair collisions resulting from such increased general aviation operations within the affected areas would be of utmost concern to the military proponents and all means would be pursued to minimize any increased risks as discussed above. As noted for the Airspace Management Cumulative Impacts, the respective awareness of all planned/scheduled flight operations through interagency coordination and communications would help promote flight safety practices among all military and non-military interests sharing the Alaska airspace environment.

GROUND SAFETY

As with the proposed action, several of the proposed cumulative projects may involve live-fire training activities. Existing procedures for range safety and control would continue to be implemented for all training activities. These procedures include coordinating all training activities with range safety personnel, as well as closing range gates and trails and surveying target areas prior to training to ensure that unauthorized vehicles/personnel are not present. Current procedures are also designed to limit unauthorized public access to training areas. These procedures include verbal warnings, blockades of prohibited areas, and marking of such areas with appropriate placards or red flags. As required, training

areas would be cleared of unexploded ordnance (UXO) or munitions debris to reduce the related hazard and provide a safe and constructive training environment for all training units and the public.

The use of live ordnance or pyrotechnics across different actions could potentially have an impact on ground safety in the form of an increased fire risk. Sufficient fire response resources are currently available to address cumulative impacts from simultaneous activities. Additionally, current fire management and response practices would continue, including monitoring the fire weather index and modifying planned training activities accordingly as well as conducting prescribed burns and mechanical thinning in training areas. Finally, the Integrated Wildland Fire Management Plan would be updated as required to address all required training. Implementation of current policies and procedures would mitigate the potential for any cumulative impacts on ground safety.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. The potential for cumulative significant impacts would be the same as discussed above and in the Chapter 3.0 Ground Safety analyses during those periods when all Air Force and USARAK operations are in progress within the different range areas where live-fire activities are taking place. No other significant DoD actions have been identified at this time that would increase any potential for cumulative impacts. In any event, strict procedures and controls would be put in place to safely manage and protect those areas in which any hazardous activity is performed.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. No other DoD or non-military airspace actions or aircraft operations have been identified for the JPARC region of that would result in any significant increase in flight safety risks beyond what is discussed in this EIS for future civil aviation growth in Alaska to include aviation activities supporting the Susitna-Watana hydroelectric project, Denali Air Special Recreational Use, Pure Nickel Mineral Exploration and Mining Operations, or such activities. Any greater potential for aircraft mishaps and near misses/midair collisions resulting from such increased general aviation operations within the affected areas would be of utmost concern to the military proponents and all means would be pursued to minimize any increased risks as discussed above. As noted for the Airspace Management Cumulative Impacts, the respective awareness of all planned/scheduled flight operations through interagency coordination and communications would help promote flight safety practices among all military and non-military interests sharing the Alaska airspace environment.

4.8.4 Air Quality

Aggregate Impacts of Multiple JPARC Proposed Actions. Cumulative impacts on air quality would consist of the proposed actions combined with any other past present, or future actions that would significantly affect air quality. As presented in Chapter 3.0 of this EIS for each proposed action, emissions increases from the proposed activities would be well below applicable conformity and NEPA emission significance thresholds. Any concurrent emissions-generating action in the vicinity of proposed activities would potentially contribute to the ambient impact of these emissions. However, since the proposed changes in operations would produce only minor increases in emissions, the combination of proposed actions and future project air quality impacts would not contribute towards an exceedance of any ambient air quality standards.

Regarding emissions of carbon monoxide and particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), some proposed operations would occur close to and inside the carbon monoxide maintenance and $PM_{2.5}$ nonattainment areas in Fairbanks North Star Borough (FNSB). Due to the large area of operation, ambient concentrations of these pollutants would be well diluted when transported to FNSB. Emissions of these pollutants from other future sources and projects in the region would occur far enough away from the FNSB nonattainment and maintenance areas that they would result in low increases in ambient carbon

monoxide and $PM_{2.5}$ levels. As a result, the combination of proposed operational emissions of carbon monoxide and $PM_{2.5}$ and future project air quality impacts would not contribute towards an exceedance of any ambient air quality standards for the $PM_{2.5}$ nonattainment and carbon monoxide maintenance areas.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. Emissions from recent DoD actions have generally been included in the baseline emissions for the areas of the proposed actions. Past, present, and future DoD projects affecting air quality in the region of the proposed actions include the resumption of year-round firing activities at JBER, range complex training land upgrades, relocation of the Air National Guard (ANG) 176th Wing to JBER, establishment of the Delta MOA complex, Donnelly Training Area–East (DTA-East) mobility and maneuver enhancements, Eielson AFB infrastructure development in support of RED FLAG–Alaska, and a Northern Rail Extension project.

The emissions analyses for the project alternatives determined that proposed increase in operational emissions would produce very low ambient pollutant impacts on the nearby pristine Denali National Park PSD Class I area. The nominal increase in ambient pollutant levels attributable to proposed emissions within this area, in combination with emissions from other future sources and projects in the region, would produce less-than-significant impacts on air quality values and visibility within Denali National Park. Therefore, proposed emissions would produce less than significant cumulative air quality impacts to the nearest PSD Class I area.

A beddown of F-35 aircraft at Eielson AFB (not currently proposed), whether additive to current operations or a replacement, would undergo evaluation, and could cause some increase in emissions, but it is unlikely that these would cause significant impacts in combination with other military operations in any specific air quality region.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. Past, present, and future projects affecting air quality in the region of the proposed actions include the development of the Susitna-Watana hydroelectric project, Eastern Interior Rail Extension, the Eastern Tanana Area Plan (ETAP), and the East Alaska Resource Management Plan (RMP) (including biomass harvesting and additional mining). Associated activities will mostly occur outside of the FNSB area and not cause cumulative effects contributing to regional air quality concerns, and all projects will undergo evaluation based on location and projected emissions.

Many of the current and proposed projects in Alaska take place on the coast. These projects would be in the same area that is used for the live-fire exercises of AIM-9 and AIM-120 missiles. Some of the coastal projects in Alaska that affect air quality in the coastal region are the Exxon Valdez Oil Spill Restoration, the Port Mackenzie Development, and the Port of Anchorage Development. Cumulative impacts from the proposed actions and these non-DoD actions would not result in significant cumulative air quality impacts in the coastal areas of Alaska.

4.8.5 Physical Resources

Aggregate Impacts of Multiple JPARC Proposed Actions. Proposals that have the potential to interact with each other and provide a cumulative impact on physical resources include those projects involving roadway usage, off-road maneuvering (both vehicular and by training personnel), ordnance usage (both live and inert), and any actions in which regular ground disturbance would occur. For both programmatic and direct actions, access and other roadways and any accompanying infrastructure would have been constructed in compliance with all DoD, U.S. Army Garrison Fort Wainwright, Alaska (USAG-FWA), Federal, and State regulations for minimization of impacts on soils, up to and including the potential for soil erosion. As such, any future actions involving extended use of constructed roadways should not result in significant impacts on soils. Existing regulations require that off-road maneuvering in other than

established training areas be kept to a minimum (i.e. conducted only in emergency circumstances); military vehicles should remain on established roads only until reaching a designated training or staging area. Therefore, usage of roadways constructed as a result of the proposed actions would not have any significant cumulative impact.

Ground maneuvering during training or staging activities, both by personnel and by tracked vehicles, has the potential to increase soil disturbance and erosion. Existing best management practices (BMPs) and standard operating procedures (SOPs) as described in guidance documents such as the Integrated Natural Resources Management Plan (INRMP), the Range and Training Land Assessment, and previous NEPA compliance documents would ensure that ground disturbance and subsequent soil erosion were kept to a minimum. Cumulative impacts on soils as a result of ground maneuvering would therefore be minor.

For those actions requiring road construction in previously undisturbed areas, it would be assumed that technical specifications for the roadway are in line with all current regulations designed to minimize heat transfer and thus prevent any further permafrost degradation beyond that potentially associated with construction. Cumulative impacts of future roadway usage would therefore be minimal. Similarly, for those actions involving ground maneuvering and training, DoD and USAG-FWA regulations require that training take place in areas of minimal underlying permafrost whenever possible and that measures be taken to ensure cover vegetation is not removed. Therefore, cumulative impacts to permafrost would be minimal.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. The definitive JPARC proposals have little potential to cause significant impacts on physical resources due to the limited amount of ground disturbance entailed. However, programmatic proposals for additional roads and ground-based maneuver could cause significant impacts on military lands (Yukon Training Area [YTA], Donnelly Training Area [DTA], and Tanana Flats Training Area [TFTA]). Permitting for development and functions on DoD land should manage any progressive impacts on physical resources through the institutional use of BMPs and compliance with regulatory requirements in permits and leases (such as stipulations on energy development or pipeline development by Federal or State regulators and land managers).

Cumulative Impacts of JPARC Proposals with other DoD and Non-Military Actions. Progressive development in the Fairbanks and Delta Junction area (through conversion of natural land for industry, infrastructure, residential and commercial uses) could have a progressive impact on soils, erosion and surface hydrology. In combination with JPARC proposals, and particularly the possible implementation of the programmatic proposals for additional roads and ground-based maneuver would add to these impacts. Permitting for development and functions (both on DoD and non-military land) should manage any progressive impacts on physical resources through the institutional use of BMPs and compliance with regulatory requirements in permits and leases (such as stipulations on energy development or pipeline development by Federal or State regulators and land managers). Development for the Susitna-Watana hydroelectric project does not overlap with any surface actions for JPARC or other military actions. This project and potential mineral development in the Fox 3 MOA area may have substantial localized impacts on physical resources, but these would not accumulate surface impacts with the JPARC proposals.

4.8.6 Water Resources

Aggregate Impacts of Multiple JPARC Proposed Actions. The geographic scope of the cumulative impacts of water resources is the TFTA, DTA, and Yukon Training Area (YTA) in the Fairbanks area and the watersheds immediately upstream and downstream of those training areas. The geographic scope is based on the area affected by ground disturbance from the proposed actions.

WATER QUALITY

Weapons training involving explosive munitions could impact surface water and groundwater quality. However, preliminary data from water quality monitoring indicates that munitions residues are not moving out the impact areas through surface water, ground water, windblown soils, or wildlife (USARAK 2006-2). With the mitigation and monitoring described in Sections 3.2.6.4 and 3.9.6.4, the cumulative impacts of weapons training on water quality would be less than significant.

Existing USARAK maneuver training involves stream crossings on YTA, DTA, and TFTA. TFTA training has occurred in the winter, which prevents direct sedimentation impacts on streambeds. Community growth in the Fairbanks area leads to an increase in overland flow and direct runoff and can also decrease water quality due to non–point source pollution. Construction of the Northern Rail Extension and the Alaskan Pipeline Project could increase sedimentation due to ground disturbance within the rights-of-way. Off-road vehicles (ORVs), off-road recreational vehicles (ORRVs), snowmachines, and airboats used for recreation and hunting often deviate from trails, leaving temporary trails. Scars from these trails can be long-lasting in some areas and a source of sedimentation in waterways and water bodies.

The construction of facilities, roads, and infrastructure for the ISBs, the JAGIC, and access routes would potentially increase sedimentation in waterways and water bodies. In addition, enhanced maneuver training could remove vegetation, which would increase sedimentation. Given implementation of the SOPs, BMPs, and mitigation measures cited in Chapter 3.0, sedimentation impacts on water quality would be moderate. Therefore, the contribution of the proposed actions to cumulative impacts on water quality due to sedimentation would be less than significant.

FLOODPLAINS

USARAK maneuver training involves stream crossing within the floodplains in YTA, DTA, and TFTA. Additional stream crossings could be developed as part of the proposed TFTA roadway access and enhanced access to vehicle maneuver space. In addition, the Northern Rail Extension would require a bridge over the Tanana River and could include portions of the railway within the floodplain of the Tanana River. The ISBs and JAGIC would be outside of the floodplain of major creeks and rivers. The cumulative impacts on floodplains from stream and river crossings would be less than significant.

WETLANDS

Wetlands can be damaged through maneuver and weapons training and lost due to the construction of facilities, roads, and access routes. In addition, wetlands are sensitive to indirect changes in hydrology, soil composition, and vegetation attributable to development. Past military vehicle use was largely restricted to the winter because of the impracticality, mechanical difficulties, and potential wetlands damage from operation in other seasons. Most of DTA (68 percent) and TFTA (74 percent) is wetlands, and approximately 17 percent of YTA is covered by wetlands (USARAK 2004-1). Overall wetland acreage in the DTA, TFTA, and YTA is approximately 958,000 acres (388,000 hectares).

The Northern Rail Extension would fill 814 acres (329 hectares) of wetlands within and in the immediate vicinity of TFTA and DTA (STB 2009). The Alaskan Pipeline Project may also result in the fill or disturbance of wetlands along the pipeline right-of-way. National regulations ensure that wetland permits are acquired before construction. ORVs, ORRVs, snowmachines, and airboats used for recreation and hunting often deviate from trails, leaving temporary trails. Scars from these trails can be long-lasting in some areas and damaging to wetlands.

TFTA roadway access and enhanced access to ground maneuver space (EGMS) could have negative impacts on wetlands in DTA, YTA, and TFTA. EGMS is programmatic, and the locations and footprints

of the access roads have not been determined. However, building roads that can be accessed year-round requires filling and grading long linear corridors through the training areas. Because of the high cover of wetlands in the training areas, it would be difficult to avoid damaging or destroying wetlands. Vehicle maneuvering in the summer is substantially more destructive to vegetation and wetlands than it is in the winter. Additionally, wetlands would be lost during construction of the ISBs and the JAGIC. There could be four ISBs and each ISB would have an approximately 110-acre footprint. The raw area of the JAGIC would cover 30,000 acres (12,100 hectares), but the area that would be impacted by ground disturbance with the construction of facilities and access roads would be much smaller. Therefore, the proposed actions in combination with other cumulative projects could result in a net loss in regional wetlands. Without mitigation, the overall cumulative loss of wetlands would likely be less than 10,000 acres (4,000 hectares) or less than 1 percent of the wetlands in the training areas. USAG-FWA's policy is no net loss in wetlands and USAG-FWA's active management plans serve to continually repair and restore wetland resources. In addition, mitigation required by the COE as part of the wetland permit process would reduce these impacts (refer to Chapter 3.0 for additional details). Therefore, with mitigation according to USAG-FWA's policies and procedures and mitigation according to the U.S. Army Corps of Engineers (USACE) wetland permit, the contribution of the proposed actions to cumulative impacts on wetlands would be less than significant.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-military Actions. Based on current projections, there is little geographic overlap between JPARC projects and other DoD and non-military actions, so potential for cumulative impacts is minimal. All large-scale projects involving activities and ground disturbance will need to comply with existing regulations and permitting and would implement BMPs and requisite mitigations as part of the regulatory approval process.

4.8.7 Hazardous Materials and Waste

Aggregate Impacts of Multiple JPARC Proposed Actions. With respect to programmatic actions involving new construction, cumulative regional construction could result in increased incidental spills of hazardous materials. Petroleum, oil, and lubricant products (POLs) would be used by equipment and vehicles involved in construction. Spills of petroleum products or hazardous waste could potentially penetrate into onsite soils, resulting in soil and/or groundwater contamination. SOPs are in place for the cleanup of any spills that might occur. Similarly, disturbance of any known or unknown contaminated waste sites during regional training, construction, and operations would be addressed through standard IRP and MMRP procedures. Separate environmental analyses address project-specific hazardous materials and hazardous wastes. BMPs for regional construction and operations would reduce the potential cumulative impacts.

With respect to munitions, there would be an increase in residual metals contamination in soil as a result of increased ordnance use throughout the cumulative ROI. However, residual metals concentrations would be reported to EPA as required, and ordnance use would comply with existing range SOPs and BMPs, thus minimizing the potential for off-range migration of contaminants in surface water and groundwater that could result in the comingling of contaminants from multiple sources. As a result, significant cumulative impacts would not occur.

Cumulative Impacts of JPARC Proposals with other DoD and Non-Military Actions. Permitting requirements for the use and management of hazardous materials, wastes, and petroleum products will apply to both military and non-military industrial-scale operations in the JPARC ROI. Reporting and auditing of these operations by applicable regulators should manage and control the release of harmful products into the environment. The use of BMPs and compliance with permits requirements will minimize the potential for significant impacts from hazardous materials and wastes in the region over time.

4.8.8 Biological Resources

Aggregate Impacts of Multiple JPARC Proposed Actions. The study areas for the biological cumulative impacts analysis encompass the principal regions for activities related to JPARC definitive and programmatic actions. In the greater JPARC region around Fairbanks, the biological cumulative impacts analysis focuses on the habitats underlying and near the proposed expanded Fox 3 and new Paxon MOAs, as well as habitats within and near TFTA, DTA, and YTA. A separate study area is identified for the AIM-9 and AIM-120 missile training proposal, which would take place over the GOA. The study area boundaries necessarily extend outward from these project boundaries to encompass offsite and indirect effects that may be associated with activities conducted within the training areas.

Cumulative direct impacts on biological resources may result from loss of habitat or impaired access to important life-cycle resources on a population scale for those projects that include substantial ground disturbing activities, especially if combined, such as TFTA Road Access, Enhanced Ground Maneuver Access (EGMS), and ISBs. Project-related developments that reduce areas of vegetation communities and/or reduce or encroach on seasonal wildlife habitats have direct, local impacts. These adverse effects, when added to other projects occurring within the same geographic area, may have significant impacts. However, the cumulative amount of big game and migratory waterfowl seasonal habitat that would be permanently affected under the proposed JPARC projects that require facilities development within training areas is small compared with the overall amount of similar habitat available in the region. Training areas in general retain a fairly open character that allows many species to resume the behaviors to which they are accustomed after completion of construction or a training activity. No listed threatened or endangered species, or species proposed for listing, have been identified in the JPARC training areas, with the exception of the area designated for the live-firing of AIM-9 and AIM-120 missiles. This project is addressed separately below because it would take place in a different region (GOA), which contains different resources than areas where the other proposed JPARC actions would occur. The land types and wildlife present in the cumulative impacts analysis area are generally widely distributed, and few limitations to their availability were identified. Indirect impacts on wildlife include the addition of military training exercises and associated noise, human presence, and other disturbances that may cause changes in resting or feeding cycles, displacement from habitat, masking of sounds and related changes in vocal behavior, or disrupted breeding or young-rearing activities.

The primary issue of concern expected to result from implementation of the JPARC definitive and programmatic proposals under consideration is the introduction of year-round access of troops and equipment to the training areas, which means that training would be enabled during periods when the ground is not frozen, and thus during the breeding periods of most wildlife species. Migratory birds, generally absent when the ground is frozen, would be present and breeding during these seasons. Additionally, several of the programmatic proposals call for construction of roads to enable all-season access within and to training areas, and several of the programmatic proposals call for construction of large-scale facilities in each of the training areas. These projects, particularly those including road construction with the resulting habitat fragmentation, may have substantial cumulative direct and indirect impacts on vegetation and wildlife in the areas of higher troop occupancy during times of use. For this reason, the important habitat areas listed by project in the preceding chapters as siting criteria should be included in project final design to avoid adverse impacts to the extent practicable. BMPs for seasonal restrictions on removal of vegetation for construction and replacement thereof with native species would reduce adverse impacts. JPARC project changes would take place against a background of recent increases in troop strength and intensification of training in the JPARC area. Additionally, global changes in climate are manifesting themselves locally in an “Arctic warming trend,” including a shorter period of frozen conditions—that is, a later onset of freezing in the fall and an earlier thaw in the spring. According to Comiso (2003), the melt season in the Arctic is lengthening by 10 to 17 days per decade. Walsh et al. (2011) indicates that during the past decade, the Arctic has experienced its highest

temperatures of the instrumental record and that recent paleo-reconstructions also show that recent Arctic summer temperatures are higher than at any time in the past 2,000 years. Warming since the 1800s, as shown by the instrumental data, is outside the envelope of natural variability observed over the last 2,000 years (Walsh et al. 2011). These changes and related changes (e.g., diminishing extent of sea ice), the effects of which are not fully understood, are expected to put additional pressures on the plants and wildlife of the region (Burrows et al. 2011). Therefore, the cumulative impacts from multiple JPARC proposed projects are expected to be adverse and significant for several biological resources.

The following discussion summarizes the analysis by site-specific JPARC geographic areas, with other DoD and non-DoD actions.

FOX/PAXON MOAS

Cumulative Impacts of JPARC Proposals with other DoD Actions. No cumulative impacts on vegetation are expected because project activities in this area involve overflight only, and there would be no related ground activity that could directly affect vegetation resources or wildlife habitat. The primary issue for wildlife is behavioral response to jet aircraft overflight at altitudes as low as 500 feet above ground level (AGL). Under the proposal, flights as low as 500 feet AGL could occur in the existing Fox 3 MOA (where the current lower altitudinal limit is 5,000 feet AGL) as well as in the proposed expanded Fox 3 MOA and the proposed Paxon MOA that would be established to the east of the expanded Fox 3 MOAs. Under the proposed action, all these airspace areas would have a minimum flight altitude of 500 feet AGL. Potential disturbances to wildlife in this area could include behavioral responses to overflights during critical life stages such as calving/lambing, or movement induced by overflights requiring additional energy expenditure. The Fox 3/Paxon MOA areas lie to the south of and do not overlie any of the ground-based training areas discussed below. The proposed Fox 3/Paxon MOA area would also be subject to changes in timing of nighttime overflights associated with the JPARC NJT project. There would be very limited interchange of animals between the training areas and the MOAs because of the intervening mountainous terrain of the Alaska Range. Because the biological effects of the Fox 3/Paxon MOA airspace are expected to be adverse but not significant, and because no substantial impacts on biological resources from other projects in the affected area have been identified, cumulative impacts in this area would be insignificant.

Cumulative Impacts of JPARC Proposals with Other Non-Military Actions. The Susitna-Watana Hydroelectric Dam and the Pure Nickel Mineral Exploration and Mining Operations projects may include widespread environmental effects to terrestrial and aquatic wildlife species and their habitats in the Susitna River watershed under the Fox/Paxon MOAs analysis area and downstream. Because the JPARC actions proposed for the Fox/Paxon MOAs are not expected to affect biological resources in a significant manner with implementation of the proposed mitigation measures, this proposal would not make a substantial contribution to other significant cumulative impacts in the area.

DONNELLY TRAINING AREA

Cumulative Impacts of JPARC Proposals with Other DoD Actions. Substantial losses of vegetation within DTA are not expected, given the amount of construction proposed and the availability of similar vegetation types in the region. BMPs and SOPs are in place that would minimize the effects of construction in the training area and activities in the target areas. The primary issue for wildlife is the expansion of year-round access for training activities, which could disturb or cause temporary avoidance of resting or nesting areas by migratory waterfowl, and could also disturb moose calving/rutting, brown bear spring and fall resource access, and caribou calving/rutting activities. The combination of changes in seasonal troop access and intensification of training activity associated with JPARC proposals coupled with recent increases in troop numbers and intensification of training in DTA is likely to have adverse impacts on wildlife. Established BMPs include scouting training areas for big game prior to performing

training activities and halting such activities if big game are present. For JPARC proposals involving the expansion of restricted areas near rivers (such as BAX), established military flight practices for the interests of personal safety will ensure that pilots remain aware of waterfowl congregation areas and seasons, and this should reduce potential training disturbances of migratory birds. Although the individual JPARC definitive and programmatic projects affecting DTA may be less than significant on an individual basis given application of mitigation and established resource-protective BMPs and SOPs, collectively the direct and indirect impacts on biological resources would be substantial within portions of DTA and the site-specific impacts cumulatively significant.

Cumulative Impacts of JPARC Proposals with Other Non-Military Actions. No cumulative effects are expected from non-military projects except for the Northern Rail Extension project, which could have substantial impacts to habitats and species that use them along the 80-mile stretch of the Tanana River. This includes a portion of the route outside the western boundary of YTA, an area used primarily by waterfowl and moose. Much of this area is north of DTA but some overlap occurs, including with DTA-East, and has the potential to add to effects from JPARC on anadromous fish habitat and several species that use the wetlands area there, including moose for calving, caribou in winter, sandhill cranes, other waterfowl, and raptors during migration. Therefore, the cumulative impacts from multiple JPARC proposed projects including EGMS, ISBs, and JAGIC with the addition of the Northern Rail Extension project are expected to be adverse and significant for several biological resources.

TANANA FLATS TRAINING AREA

Cumulative Impacts of JPARC Proposals with Other DoD Actions. Localized substantial losses of vegetation and habitat in the TFTA Road Access project area would be associated with construction of proposed access roads. BMPs and SOPs in place would minimize, to the extent practicable, the impacts to biological resources of road construction in the training area and activities in the target areas. The primary issue for wildlife is the introduction of a year-round, all-weather access road within TFTA for training activities. Currently, TFTA has only been accessible during the winter months, and the new disturbance outside of winter may disturb or cause temporary avoidance of resting areas by migratory waterfowl, adversely affect nesting activities that could cause reproductive loss, may adversely impact moose calving/rutting activities, or may affect fish spawning streams. The combination of changes in seasonal access and intensification of training activity associated with JPARC proposals, coupled with recent increases in troop numbers and intensified training in TFTA is likely to have adverse impacts on wildlife. Established BMPs include scouting training areas for big game prior to performing training activities and halting such activities if big game are present. As for DTA, preflight pilot awareness of migratory waterfowl congregation areas and seasons may reduce disturbance to birds present. Although the impacts of individual JPARC definitive and programmatic projects on TFTA may be less than significant given application of mitigation and established resource-protective BMPs and SOPs, collectively the direct and indirect impacts on biological resources would be substantial within portions of TFTA, and the site-specific impacts would be adverse and cumulatively significant.

Cumulative Impacts of JPARC Proposals with Other Non-Military Actions. No cumulative effects are expected from non-military projects except for the Northern Rail Extension project, which could have substantial impacts to terrestrial, wetland, and aquatic habitats and species that use them along an 80-mile stretch of the Tanana River. TFTA has the largest boundary overlap with the Northern Rail Extension project, which could add to effects from JPARC on anadromous fish habitat, raptors during migration, waterfowl, moose all year, and a small portion of habitat for caribou winter use. Therefore, the cumulative impacts from multiple JPARC proposed projects including TFTA Road Access, EGMS, and ISBs, and JAGIC with the addition of the Northern Rail Extension project are expected to be adverse and significant for several biological resources.

YUKON TRAINING AREA

Cumulative Impacts of JPARC Proposals with Other DoD Actions. Substantial impacts on vegetation within YTA are not expected given the amount of construction proposed and the availability of similar vegetation types in the region. BMPs and SOPs in place would minimize the effects of road and other construction in the training area and activities in the target areas. The primary issue for wildlife is the introduction of year-round access for training activities, which may disturb or cause moose to avoid the localized calving/rutting habitat on YTA. Established BMPs include scouting training areas for big game prior to performing training activities and halting such activities if big game are present. The combination of changes in seasonal access and intensification of training activity associated with JPARC proposals coupled with recent increases in troop numbers and intensified training in YTA is likely to have adverse impacts on wildlife. Although the impacts of individual JPARC definitive and programmatic projects on YTA may be less than significant given application of mitigation and established resource-protective BMPs and SOPs, collectively the direct and indirect impacts on biological resources would be substantial within portions of YTA, and the site-specific impacts would be adverse and cumulatively significant.

Cumulative Impacts of JPARC Proposals with Other Non-Military Actions. No cumulative effects are expected from non-military projects except for the Northern Rail Extension project, which could have substantial impacts to habitats and species that use them along an 80-mile stretch of the Tanana River. This includes a portion of the route along the eastern edge of YTA, an area used primarily by waterfowl and moose. Therefore, the cumulative impacts from multiple JPARC proposed projects including EGMS, ISBs, and JAGIC with the addition of the Northern Rail Extension project are expected to be adverse and significant for several biological resources.

TEMPORARY MARITIME ACTIVITIES AREA (TMAA)

Cumulative Impacts of JPARC Proposals with Other DoD Actions. The live firing of AIM-9 and AIM-120 missiles is a programmatic action that would take place within the TMAA offshore in the GOA. This involves the Air Force's firing of AIM-9 and AIM-120 air-to-air missiles from F-22 aircraft at unmanned aerial targets (typically flares or tactical air-launched decoys over the GOA). The same area is the subject of proposed land, air, and undersea training activities evaluated in a 2011 final environmental impact statement/overseas environmental impact statement (EIS/OEIS) (Navy 2011) in which use of the same missile types by Navy aircraft is addressed, although this use is a minor component of the overall Navy proposed action. The TMAA supports populations of endangered or threatened species, including marine mammals, sea turtles, and birds, as well as Essential Fish Habitat (EFH). The primary residual impact of these air-to-air missile training exercises is that the expended missiles and targets enter the marine environment and are not recovered, ultimately settling on the ocean floor where they would be colonized by benthic marine organisms and slowly degrade. These objects would be widely dispersed over the TMAA area of 42,146 square nautical miles (NM^2) (145,482 square kilometers [km^2]). Expended training materials may slowly leach toxic substances at very low concentrations with minimal and localized adverse effects on marine water quality or biota. Any effect would be confined to the individual object and would diminish to background levels at very short distances from the object. Effects of the Air Force JPARC programmatic action would be in addition to the combined effects of the proposed surface, subsurface, and aerial combat training proposed by the Navy (Navy 2011), but the cumulative impact would be less than significant because of the very small magnitude and less-than-significant effect of the programmatic action proposed by the Air Force.

Cumulative Impacts of JPARC Proposals with Other Non-Military Actions. No cumulative effects have been identified that would affect biological resources within this area.

4.8.9 Cultural Resources

Aggregate Impacts of Multiple JPARC Proposed Actions. No construction would be associated with the JPARC definitive proposed actions. Thus, historic buildings and archaeological sites at the JPARC AFBs and Army Posts would not be impacted. Previous projects, such as *Stationing and Training of Increased Aviation Assets within USARAK* (USARAK 2009-1) and *Resumption of Year-Round Firing Opportunities at Fort Richardson, Alaska* (USARAK 2010-1), resulted in on-base construction, some of which affected historic architectural resources at Fort Wainwright and Fort Richardson.

Cumulative Impacts of JPARC Proposals and Other DoD Actions. Other past DoD projects with a potential to contribute to cumulative impacts on ROI cultural resources include the *Final Environmental Impact Statement for the Construction and the Operation of a Battle Area Complex and a Combined Arms Collective Training Facility within U.S. Army Training Lands in Alaska* (USARAK 2006-1). Construction and use of range facilities affected cultural resources at the Eddy DZ in DTA-East. Consultations and adopted mitigations in compliance with Section 106 of the National Historic Preservation Act (NHPA) reduced impacts to acceptable levels. Implementation of JPARC programmatic actions involving widespread ground disturbance could have significant impacts on some locations. These proposals will undergo thorough investigation, consultation, and mitigation, as identified in that process.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. Civil projects with a potential to contribute to cumulative impacts on ROI cultural resources include the Northern Rail Extension and the future Alaska Pipeline Project. Such projects potentially result in direct impacts on archaeological resources. TransCanada and ExxonMobil are pursuing the construction of a natural gas pipeline from the North Slope through central Alaska into Canada, a project that could impact cultural resources and thus contribute to area cumulative impacts. Section 106 review has been undertaken separately for these projects. Similarly, large-scale actions such as the Susitna-Watana hydroelectric project and Pure Nickel mineral exploration and development in the Amphitheater Mountains may have substantial impacts on cultural resources, but these do no overlap with surface activities for any of the definitive JPARC proposals or future DoD actions that might expand surface training on military lands.

Any Federal projects are subject to compliance with NEPA and Section 106 of the NHPA with the result that adverse effects would be mitigated, reducing cumulative impacts that could occur.

The JPARC definitive proposed actions would not be expected to result in significant impacts on any buildings, archaeological sites, or traditional resources eligible for listing on the National Register of Historic Places (National Register) in the ROI. The projects would be subject to compliance with NHPA Section 106, with the result that adverse effects would be mitigated. The JPARC TFTA Roadway Access Proposed Action has greater potential to result in impacts on archaeological sites or traditional resources if the route selected passes through areas historically or currently used by Alaska Native peoples. As with other Federal actions, the TFTA Roadway Access project would be subject to compliance with NHPA Section 106, and the adverse effects would be mitigated to an acceptable level. Thus the JPARC definitive and programmatic proposed actions would not be expected to result in incrementally significant or adverse cumulative impacts on National Register-eligible buildings, archaeological sites, or traditional resources in the region in conjunction with other past, present, or reasonably foreseeable projects.

4.8.10 Land Use

The primary interactions that multiple actions may have on land use, public access and recreation would derive from the following:

- Effects of noise from aggregated use of SUA or expansion of SUA
- Effects from closure or restricted access on the ground due to aggregate hazardous activities (particularly on non-military land)
- Effects of construction and development in terms of displacing current uses or changing the suitability of an area for ongoing uses and activities
- Effects from increasing the operational tempo of surface and air missions within the JPARC on non-military uses and activities

Aggregate Impacts of Multiple JPARC Proposed Actions. The combination of JPARC proposals could expand the areas where military activities occur both in the air and on the surface. The Fox 3/Paxon MOA proposal and additional night joint training in selected MOAs could together increase noise levels by about 1 dB over those assessed. This incremental difference would have minimal effect on underlying non-military land although night overflight may be bothersome to some remote communities or homesteads. Several other proposals would use restricted airspace where noise impacts from aircraft would primarily affect underlying military land which serves uses that are not noise sensitive. Public use for recreation on military land tends to occur when military missions are not taking place nearby (therefore, noise is not a direct concern).

Several actions would increase (and expand the area underlying) restricted airspace for both hazardous and non-hazardous training, particularly on DTA-West, DTA-East, YTA, and TFTA and the area between R-2211 and R-2202. Cumulatively these would result in less time available for non-military uses (mostly hunting) on military land in the Fairbanks area from about 80 percent down to less than 50 percent available annually. With a similar loss of access to adjacent State land (for RLOD), this would have an adverse and potentially significant impact on recreation and hunting for the residents in the Fairbanks/Delta Junction area. The Army will continue to publish its training and area closures particularly during September to allow the public to make appropriate plans based on whether they will be able to access military lands.

Physical changes on military land from more ground-based activity for integrated training and ground maneuver training could alter vegetation and surface conditions. This disturbance could indirectly lead to changes in wildlife and their movement patterns, and changes in the appearance of the landscape. This could have potentially significant indirect impacts on the quality of hunting and recreation on military land with longer-term effects. The ISB, TFTA Roadway Access, and EGMS proposals may involve development of land in the same general area, with combined effects particularly on TFTA.

Cumulative Impacts of JPARC Proposals with Other DoD Actions. DoD actions that may cumulatively affect land use and recreation are primarily those involving use and changes to SUA. Past and recent actions are reflected in baseline noise conditions and form the existing context for land use and recreation in the region. In combination with these past actions and the EIS proposals, any future Air Force restructuring could result in redistribution of training activities. This could result in increased use of specific regional SUAs and increased noise levels in underlying areas. It is unknown to what degree any future changes in noise could impact existing sensitive locations. For example, F-35s could fly at higher altitudes than a current mission (resulting in attenuated noise levels) but also could increase noise at a staging location or supersonic activity in the region. Evaluation of future Air Force proposals would use an updated baseline of flight activity and could find potential for significant noise impacts in some locations. The Air Force would continue to coordinate with agencies to identify and avoid sensitive locations for future military actions.

Several actions have in the past involved ground-based activities on military ranges and training areas (such as ground maneuver, development and use of military infrastructure firing ranges). These are

reflected in existing baseline conditions. To date, availability of military land for public access and recreation has been relatively high. Historic activities have resulted in restricted access on portions of military land due to hazards (primarily from UXO). The current proposal would not increase the amount of land that is continually in accessible, although temporal restrictions would increase on accessible land. Foreseeable future proposals and development of the JPARC over time may further decrease the amount of time that public use can take place on military land. Impacts from this may affect a small percentage of the local population that preferentially hunt and recreate on military lands. This is a moderate impact for a few persons. Ground-based military actions should have little effect on non-military lands and surrounding areas. Future proposals should evaluate any expansion of noise exposure greater than 62 dB CDNL and peak exposure above 115 dB outside of military land, particularly if they involve new types of munitions or increased expenditures.

In general, management plans and conservation actions (implemented for most of the training lands in the ROI) will improve natural resources and address sustainable public use on State and Federal land. Many past, ongoing, and future actions involve airspace use and have included ongoing measures to reduce effects of noise on land uses. JPARC operations will not generally directly interfere with access and implementation of these plans; however, noise from diverse military missions (both air and ground) may conflict with goals for recreation and pristine areas in nearby areas and within surrounding communities.

Specific actions, such as the RLOD and R-2205 expansion proposals have potential to impinge on real estate interests outside of current military land. Other military actions in the future (such as a more fully defined JPADS capability) may also affect lands outside the existing training areas. Incremental expansion of surface access for military use (in combination with the military withdrawals) has had a major influence on land use in the Fairbanks area. While the local economy has had great benefit from the military presence, future attention to mutual encroachment is becoming more necessary.

Cumulative Impacts of JPARC Proposals with Other DoD and Non-Military Actions. In addition to military actions in the region, future development and productive uses on Federal and State lands may impact physical and biological resources, and in some areas, may affect recreational opportunities and other land uses. Several non-DoD actions (recent past and ongoing) involve planning and the implementation of management priorities for Federal, State, and borough lands within the greater ROI of the JPARC. These will influence how and what development and use is preferred and the degree to which controls of any kind are used to manage future uses. For example, the continuing urbanization in and around Fairbanks and the along the Alaska Highway is slowly transforming the natural landscape and the interface between valued natural qualities in the region and the desire for economic and community stability. The areas with most overlap with JPARC include the Alaska Range, Talkeetna Mountains, the Fairbanks-Delta Junction Corridor, Richardson Highway and Paxson area, and Chena River area. The degree to which cumulative regional uses develop incompatibility and pressure on the natural environment could trigger a need for an east-central Alaska regional joint land use study (JLUS) in the future.

The new alignment for the Northern Rail Extension provides opportunities for crossing the Tanana River, for both military and non-military purposes. In addition to the existing Trans-Alaska Pipeline, a new Alaska Pipeline Project has a preliminary alignment that passes through this same area. Several JPARC actions (TFTA Roadway Access, new ISBs, and EGMS) involve developing and committing land to support human activities in the same general area within the Fairbanks-Delta Junction corridor. To ensure mutual compatibility and benefit, these actions would benefit from coordinated planning with other regional agencies on transportation requirements, bridges, and potential joint-use of new infrastructure in the Fairbanks-Delta Junction corridor. Some of the RLOD training missions would use delivery profiles where the surface danger zone (SDZ) overlaps with the new rail corridor. During the deliveries, the Air Force must clear the hazardous area of nonparticipating persons, including occupied vehicles and trains.

Most of the rail traffic (about five round-trips each day) would occur in the morning and evenings. Potential incompatibility of these uses would require coordination of schedules between the Air Force and the Alaska Surface Transportation Board to ensure that RLOD missions activating the larger SDZs occur only when trains are outside of the hazardous area.

The area underlying existing Fox 3 MOA and the proposed expansion area may undergo substantial changes from surface development of the Susitna-Watana Hydroelectric project, and additional mineral exploration and development in the Amphitheater Mountains and Tangle Lakes area. These projects will increase the level of human activity in specific locations, particularly where the Susitna project constructs roads and recreational amenities that the public may use. The cumulative effect of surface development and use of Fox 3 MOA may change qualities of solitude in localized areas. Additional access and amenities serving the growing human presence (including commercial businesses) could benefit recreational access. The cumulative effect of development may also detract from the qualities of naturalness that many persons seek who value this area for extreme and remote outdoor pursuits.

The Matanuska-Susitna Valley and the Fairbanks-Delta Junction areas are experiencing rapid growth. More people are using and extending their activities into remote areas. The consequence of this is a gradual change in remote areas that have been absent of human activity and interruptions in the past. The JPARC actions and other DoD and Non-Military actions and development add to this trend. The advantage of development is that more persons have access to resources and opportunities (both productive and recreational) in remote areas. Alaska is a vast country and will continue to have wild and pristine areas, but popular and more accessible locations may gradually experience a decline in naturalness.

4.8.11 Infrastructure and Transportation

The JPARC proposals, overall, would have minimal effect on regional infrastructure and transportation. The cumulative impact analysis considers how JPARC actions, in combination with other DoD and non-military actions, including organic regional growth, may impact these systems.

UTILITIES

Alaska is unique in the United States in terms of its infrastructure needs and capabilities. In addition to lacking an extensive interconnected road system, Alaska also has limited electrical transmission infrastructure. Other utilities such as water and wastewater plants are primarily located only in large population centers with well service and septic systems serving the rural areas. Key elements of the proposed actions and other past, present, and reasonably foreseeable future actions that would affect utilities and infrastructure include primarily facility construction for ground-based activities. The scope of these proposed changes would not be expected to substantially affect current utilities capacity in the ROI. Incremental effects of the proposed action, which are minor, would not be expected to have significant impacts or contribute to adverse cumulative impacts on utilities resources in the region. No significant increased demands on infrastructure are expected under the proposed action; therefore, no cumulative effects are anticipated. It is expected that the construction, renovation, and infrastructure improvement projects will improve access to utilities for military personnel and the public in general.

TRANSPORTATION

Transportation improvements are provided for in the Statewide Transportation Improvement Program (STIP). The STIP is guided by the Statewide Long-Range Transportation Policy Plan and covers all projected surface transportation projects, including roads, ferries, transit systems, and trails. The STIP provides a breakdown of expected projects, proposed schedules, and funding sources, and all projects in the STIP must conform to the Statewide Long-Range Transportation Policy Plan. The current 4-year

STIP (2012–2015), currently being reviewed, covers dozens of upgrade and repair projects in the ROI (Alaska Department of Transportation and Public Facilities [ADOT&PF] 2011-1). These plans are updated at least every 4 years, but can be updated more frequently.

Using 2030 forecast traffic volumes, the Alaska Department of Transportation conducted a comprehensive roadway capacity evaluation for all of the major rural highways. A planning-level assessment based on the existing highway characteristics and 2030 traffic forecasts revealed no major roadway capacity constraints. Under long-term conditions, all roadway facilities within the area currently under consideration will continue to operate at a Level of Service (LOS) C or better, with most facilities forecast to operate at LOS A and B (ADOT&PF 2010-1). Based on the future traffic operations assessment, which assumes moderate annual growth in highway traffic, traffic volumes would have to double or even triple on average in order to impact the capacity needs in the system (ADOT&PF 2010-1). Given the past, present, and reasonably foreseeable future actions considered herein, this is unlikely to occur. The proposed action is not expected to contribute to cumulative impacts on transportation. In the past, aircraft accidents occurring in remote areas led to the need for roads to be created to access crash sites. Although these roads can cause impacts to the environment, they are expected to remain infrequent in nature and impacts can be mitigated on a case-by-case basis.

The Northern Rail Extension involves the construction and operation of approximately 80 miles of new rail line from North Pole, Alaska, to Delta Junction, Alaska (See Figure 1-1 for a map of the region). The rail extension would begin at the east end of the Chena River Overflow Bridge—north of Eielson AFB—and end at the southern side of Delta Junction. The project includes new structures, such as bridges, a passenger facility, communications towers, access roads for rail line construction and operations, and sidings. The southern portion of the proposed alignment goes through the northwest corner of the proposed R-2202 expansion for the RLOD proposal, as well as existing R-2202 (See Figure 2-3). This would require the Air Force to conduct coordination and scheduling with the Alaska Railroad Corporation to ensure that nonparticipants (e.g., trains) do not enter the weapon danger zone when RLOD training exercises are being undertaken.

Consideration of cumulative impacts on marine transportation consist of the effects of the proposed action in combination with other past, present, and reasonably foreseeable actions that would increase marine traffic or conflict the GOA region. As discussed in the Navy GOA EIS, marine vessel traffic is expected to increase in the future. The volume of cargo vessels traversing the GOA is expected to increase moderately, while the volume of tanker traffic is not expected to change substantially. Cumulative impacts on marine transportation are expected to be less than significant.

Select JPARC EIS proposed actions suggest the improvement of existing infrastructure to achieve program goals. Proposed actions that would require the upgrade of trails to permanent roads or the creation of full-use roadways replacing seasonal ice roads would provide access to areas previously unusable for large portions of the year. Likewise, in the area around DTA and the town of Delta Junction, proposed trail upgrades could have beneficial impacts in regard to public access. Public access would be improved by repairing damaged roads, thereby allowing for all-season use.

4.8.12 Socioeconomics

Aggregate Impacts of Multiple JPARC Proposed Actions. Assessment of the cumulative impacts on socioeconomics of the proposed actions, in combination with other past, present, and reasonably foreseeable future actions and processes, focuses on regional employment, income, housing, key industries, or infrastructure. Based on the socioeconomic resources available, no direct cumulative impacts on housing or infrastructure are expected, although changes in employment and income could indirectly affect housing demand or funding for infrastructure projects.

Employment and income could be substantially affected by changes in key industries. Civilian aviation in particular, is important to the economic well-being of many Alaskan residents and supports many other key industries. MFEs proposed within the ranges as a result of past, present, and future DoD actions are not expected to have a cumulative impact on civilian aviation, since it is assumed that the majority of civilian aviation pilots do not traverse the ranges and are accustomed to flight paths that generally avoid these areas. However, in areas outside the ranges, additional MFEs could cause a more frequent restriction in civilian aviation and hence result in greater cumulative costs associated with rerouting or delays. Mitigation measures, as recommended throughout Chapter 3.0, would minimize cumulative impacts to socioeconomic resources from changes in airspace use.

Some activities could cause temporary displacement of, and potential economic loss by, individuals. For example, activities associated with the live firing of AIM-9 and AIM-120 missiles, in addition to activities outlined in the Navy's *GOA EIS/OEIS* (Navy 2011), and the establishment of harvest strategies for groundfish fisheries in the GOA and EFH identification and conservation plans could have a cumulative impact on commercial fishermen and boaters by causing more-frequent access restrictions in certain areas of the GOA. The level of significance would depend on the duration and frequency of testing activities, the ability and cost for fisherman to reschedule or reroute their trips, and any change in the value of their catch if popular areas are inaccessible. Most military activities are short in duration and have a small operational footprint. In addition, mitigation measures such as advanced notifications would further reduce the cumulative impacts. Effects on individuals would be mitigated by recommended criteria as outlined for each resource in Chapter 3.0.

Cumulative Impacts of JPARC Proposals with other DoD Actions. In addition to changes in key industries, military projects involving construction and demolition could increase construction employment and activity in the region. Past, present, and future projects involving construction in the general region include the range complex training land upgrades, relocation of the ANG 176th Wing to Elmendorf AFB, DTA-East mobility and maneuver enhancements, Eielson AFB infrastructure development in support of RED FLAG–Alaska, and a railhead facility. The socioeconomic effects of construction activity from these projects, along with the construction of ISBs and road accesses outlined in JPARC EIS actions, are restricted mainly to FNSB, the Southeast Fairbanks Census Area, and the Matanuska-Susitna Borough/Anchorage area. DoD actions, in general, contribute a continual but fluctuating source of expenditures in the region (from construction and personnel), particularly for the urban areas in proximity to the primary installations. This is likely to continue in the future.

Cumulative Impacts of JPARC Proposals with other DoD and Non-Military Actions. Other economic activity in the region surrounding the Matanuska-Susitna Borough include the recent Port MacKenzie Development, the Port of Anchorage Expansion, and the potential natural gas pipeline, along with military actions involving construction and demolition, could increase the demand for construction employment in the region particularly in the Matanuska-Susitna Borough/Anchorage area. An increase in the population and employment opportunities related to an increase in port traffic to the Matanuska-Susitna area could have a beneficial socioeconomic impact; however, a larger percentage of the population—i.e., people residing under the airspace of the Fox 3/MOA Expansion Proposed Action—could be exposed to adverse impacts. A change in population that would create a greater need for civilian aviation could also have cumulative impacts, for more frequent and greater restrictions in airspace use would impact a greater percent of the population. Overall, an increase in economic activity associated with a specific project is typically temporary, lasting only for the duration of the construction period; however, the cumulative impacts of construction projects create employment for the foreseeable future.

4.8.13 Subsistence

Aggregate Impacts of Multiple JPARC Proposed Actions. Proposals that in combination could have a cumulative impact on subsistence resources include the urban target set construction, the high-angle mountain marksmanship range, and helicopter gunnery. These proposals have suggested locations in DTA, which is also proposed for RLOD, the JAGIC, ISBs, and an enhanced ground maneuver area. DTA is within a State nonsubsistence area, as described in Section 3.2.13.1. Therefore, subsistence resources are not harvested or managed for State or private lands. However, the DTA is also within an area where Federal subsistence is permitted. Additional range activities and restrictions of public access to areas in DTA could further restrict subsistence activities where they are currently permitted. However, there are areas in the vicinity of the DTA that can also provide subsistence resources and are more accessible than a military installation. Therefore, no significant restrictions of subsistence resources overall is expected from these cumulative actions.

Cumulative Impacts of JPARC Proposals with other DoD and Non-Military Actions. No significant restrictions of subsistence resources are expected from the cumulative effects of the JPARC proposed action, other DoD actions, and non-DoD actions. The areas of DoD action listed in Table 4-2 currently experience levels of military activity, and subsistence resources continue to be harvested in parts of those areas that are not also State nonsubsistence areas or Federal nonrural areas. The non-DoD actions listed in Table 4-3 are not expected to directly interact with the JPARC proposed actions in such a way as to restrict subsistence harvests or affect the distribution of subsistence resources. The Bureau of Land Management's (BLM) RMP and related EIS for the Eastern Interior is not expected to affect subsistence resources, as the RMP would not affect the amount of harvest limits, open seasons, or other aspects of subsistence hunting. Ground disturbance from the JPARC proposals would be conducted within military-controlled land and would not interact with current mining operations; therefore, no cumulative impacts to subsistence are expected from the JPARC proposals and ongoing mining exploration.

4.8.14 Environmental Justice

For most resources evaluated above, no cumulative impacts were identified and in addition, no need for additional or more detailed study of potential impacts or topics was identified. The following resources would not have cumulative impacts and would not cause disproportionately high and adverse human health or environmental effects on minority and low-income populations or children: ground safety, air quality, physical resources, water resources, hazardous materials and waste, infrastructure and transportation. These resources are not addressed further.

Aggregate Impacts of Multiple JPARC Proposed Actions. Each of the JPARC programmatic proposals, including EGMS, TFTA, JAGIC, ISBs, Missile Live-Fire, and JPADS, will require further study of cumulative impacts and disproportionately high and adverse environmental or health effects when definitive sites and operations are evaluated in tiered environmental studies. For these actions, disproportionate effects are therefore not known.

Resources that have the potential to create direct or inter-related cumulative impacts on human/social resources or for which additional study or consultation would be needed to identify cumulative impacts, have the potential to create disproportionate effects and are therefore addressed below: airspace management and use, noise, biological resources, cultural resources, land use, socioeconomics, and subsistence.

Cumulative impacts on airspace management (Section 4.8.1) due to restrictions on civilian IFR and VFR traffic would not have disproportionate effects but may have inter-related impacts on human/social resources.

Cumulative noise impacts (Section 4.8.2) would occur in areas where the twelve JPARC proposed actions overlap, but would not be expected to be significant and would not create disproportionate effects.

Although biological resource impacts (Section 4.8.8) from JPARC definitive and programmatic projects affecting DTA may be less than significant on an individual basis given application of mitigation and established resource-protective BMPs and SOPs, collectively the direct and indirect impacts on biological resources would be substantial within portions of DTA and the site-specific impacts cumulatively significant. Cumulative biological impacts could inter-relate with human/social resources but would not result in disproportionate effects.

For land use (Section 4.8.10), several actions would increase the use of military land and associated restricted airspace for both hazardous and non-hazardous training, particularly on DTA-West, DTA-East, YTA, and TFTA. Cumulatively these would result in less time available for non-military uses throughout the JPARC training areas from about 80 percent down to less than 50 percent annually. Continuation of current Army practices such as adjusted training schedules to allow public access to safe training areas during the month of September when hunting is most popular and a coordinated and comprehensive public use scheduling plan would serve to limit impact on locally important land use and recreational opportunities on military lands. Such actions would reduce the potential for cumulative land use impacts and any related disproportionate effects.

With regard to land use impacts from ground-based activities, future proposals should evaluate any expansion of noise exposure greater than 62 dB CDNL and peak exposure above 115 dB outside of military land, particularly if they involve new types of munitions or increased expenditures. If noise impacts to human/social resources were projected to occur, an environmental justice evaluation would be needed.

Subsistence impacts (Section 4.8.13) related to IFR and VFR flight limitations on civilian aircraft traffic are projected for the Expanded Fox 3 MOA and New Paxon MOA proposal and the RLOD proposal, which would in turn be associated with disproportionate effects on minority and low-income populations in Alaska Native tribes with High subsistence rankings (Sections 3.1.13 and 3.2.13). These impacts combined with other JPARC and Master Plan actions would not create or contribute to cumulative impacts and therefore would not be associated with disproportionate effects.

JPARC proposals that involve construction or use of the DTA (RLOD, JAGIC, ISB, and Enhanced Ground Maneuver Area) have the potential to interact with each other and create a cumulative impact to subsistence resources. DTA is located within an area where Federal subsistence is permitted. No significant restrictions to subsistence resources are expected from these cumulative actions given access to other subsistence resources in the vicinity of DTA and no disproportionate effects on minority or low-income populations are therefore anticipated to occur.

Assessment of the cumulative impacts on socioeconomics (Section 4.8.12) of the proposed actions focuses on regional employment, income, housing, key industries, or infrastructure. Based on the socioeconomic resources available, no direct cumulative impacts on housing or infrastructure are expected, although changes in employment and income could indirectly affect housing demand or funding for infrastructure projects. Cumulative socioeconomic impacts would not result in disproportionate effects.

For cultural resources (Section 4.8.9), although no cumulative impacts are identified, JPARC actions have greater potential to result in impacts to traditional cultural resources and present activities if sites or routes include areas historically or currently used by Alaska Native peoples. If government-to-government consultation with Alaska Natives and Tribal governmental entities for the JPARC actions identifies areas where traditional cultural resources or current Alaska Native activities or practices would be adversely

affected, environmental justice issues could arise. However, because JPARC and other Federal actions are subject to compliance with NHPA Section 106, adverse cultural resource effects would be mitigated to an acceptable level for each individual proposal under these regulations, and therefore, disproportionate effects on Alaska Natives are not anticipated from cumulative impacts.

Cumulative Impacts of JPARC Proposals with other DoD and Non-Military Actions. NEPA documents addressing the DoD cumulative actions listed in Table 4-2 generally identify no environmental justice effects or if environmental justice effects are identified they would not interact substantially with JPARC actions. For DoD actions, joint-DoD-civilian, and civilian actions that have not yet undergone NEPA analysis, some of which are addressed in long range planning documents, it is not possible at this time to determine the level of impacts associated with these potential actions. Also, some are not sufficiently well-defined to allow accurate prediction of the level of cumulative impacts when combined with the proposed actions.

For most resources, JPARC EIS actions plus DoD and non-DoD actions would not create or contribute to significant cumulative impacts and would therefore not be associated with disproportionate effects on minority and low-income populations or children. Only selected resources are therefore evaluated below.

For noise resources (Section 4.8.2), actions that may or may not be taken based on the findings of USARAK Range and Training Land Program Development Plan are not yet ripe for NEPA analysis, and it is not possible at this time to determine the level of noise impacts associated with these potential actions or their cumulative impacts with JPARC actions. Similarly, if F-35 aircraft were to be bedded down at an installation in Alaska, noise impacts would be dependent on the number of aircraft and how those aircraft would operate. Future analysis would be needed to determine the location of any noise impacts outside of military land and any land uses or populations affected. An evaluation of environmental justice impacts would be needed for cumulative noise impacts if there are associated human/social effects.

For cultural resources (Section 4.8.9), although no cumulative impacts have been identified for the combined JPARC actions and other DoD or non-DoD actions, government-to-government consultation has already been initiated to identify potential impacts and any mitigations needed to avoid, minimize, or reduce impacts to acceptable levels. Therefore disproportionate effects are not anticipated.

For socioeconomics (Section 4.8.12), establishment of harvest strategies for groundfish fisheries in the GOA and other conservation measures and plans have the potential to interact with the JPARC Missile Live-Fire proposal with regard to commercial fishing impacts. Additional fishing restrictions in sensitive habitats in the GOA along with restrictions in access during military activities could result in cumulative impacts to commercial fisherman. The level of significance would depend on changes in overall changes in expenditures and the value of the catch. Assuming that employment of minority and low-income populations in commercial fishing in the GOA is reasonably representative of populations residing in the area, cumulative impacts to commercial fishing would not result in disproportionate effects.

The areas associated with DoD actions listed in Table 4-2 currently experience levels of military activity and subsistence resources continue to be harvested in those areas that are not State nonsubsistence areas or Federal nonrural areas. The non-DoD actions listed in Table 4-2 are not expected to directly interact with the JPARC actions in such a way as to restrict subsistence harvests or affect the distribution of subsistence resources. The BLM RMP and related EIS for the Eastern Interior is not expected to affect subsistence resources as the BLM would not affect the amount of harvest limits, open seasons, or other aspects governing subsistence hunting. No significant restrictions to subsistence resources are expected from the cumulative effects of the JPARC proposed action, other DoD actions, and non-DoD actions and therefore no disproportionate effects on minority or low-income populations would occur.