

FINAL

ENVIRONMENTAL ASSESSMENT

OF THE

**REDUCE BIRD AIR STRIKE HAZARDS (BASH) ALONG EAST
TOLLGATE CREEK
BUCKLEY AIR FORCE BASE, COLORADO**



Prepared for

460 CES/CEV
660 S. Aspen Street, Stop 86
Buckley AFB, CO 80011-9551

MARCH 2011

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE MAR 2011		2. REPORT TYPE		3. DATES COVERED 00-00-2011 to 00-00-2011	
4. TITLE AND SUBTITLE Environmental Assessment of the Reduce Bird Air Strike Hazards (BASH) Along East Tollgate Creek Buckley Air Force Base, Colorado				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 460 Civil Engineer Squadron (CES/CEV),660 S. Aspen Street, Stop 86,Buckley AFB,CO,80011-9551				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 65	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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Final
FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)
ENVIRONMENTAL ASSESSMENT FOR THE REDUCE BASH HAZARDS
ALONG EAST TOLLGATE CREEK

INTRODUCTION

Aircraft collisions with birds and other wildlife annually cause millions of dollars in aircraft damage and may result in loss of life and aircraft. Bird strikes, or the collision of an aircraft with an airborne bird, tend to happen when aircraft are close to the ground, just before landing or after take-off, when jet engines are turning at top speeds. The incidents are serious, particularly when the birds are sucked into a jet engine and strike an engine fan blade. That impact displaces the blade such that it strikes another blade causing a cascade, resulting in engine failure. Bird and other wildlife strikes to aircraft result in more than \$600 million in damage a year, according to Bird Strike Committee USA.

Control methods are available to reduce these losses and must be implemented by all Air Force, Air National Guard and U.S. Air Force Reserve units that plan, support or are engaged in flying missions. Birds and other hazardous wildlife on runways, taxiways, or infields create a potential safety hazard and should be dispersed before flying operations can safely continue. Birds move quickly and unpredictably, and even when left in a "safe" portion of the airfield, they can move and create an immediate hazard. The Air Force has determined that no single method of dispersal works for all problems, and that using a combination of different dispersal tools provides the best line of defense for immediate hazards.

The area along East Tollgate Creek just to the west of the southern portion of the active runway at the Buckley AFB airfield has been identified by the 460 SW in coordination with the 140th WG as an ongoing Bird Aircraft Strike Hazard (BASH) concern. This area is also within a 100-year floodplain. The presence of the birds adjacent to the Buckley AFB flightline is incompatible with the 140 WG flying mission, because birds and other wildlife on runways, taxiways, or infields create potential safety hazards for Buckley AFB personnel, the 140 WG personnel and surrounding community. The current BASH levels of controls in this portion of East Tollgate Creek, including pyrotechnics and firearms, have not been successful in satisfactorily reducing the BASH hazards in the area. The presence of the trees in and along East Tollgate Creek creates an ongoing safety hazard for the flying mission due to providing perching and roosting habitat for raptors and other bird species.

The site of the proposed action is also situated within a location designated as a Military Munitions Response Program (MMRP) Unexploded Ordnance (UXO) Disposal Area. To ensure safety risks are identified and controlled in this area, per the Defense Department Explosive Safety Board (DDESB) DoD 6055.09-STD, C14.5.1, access to this area is currently restricted to authorized personnel. No actions proposed within this Environmental Assessment (EA) would proceed without prior approval and clearance from 460 SW/SE Weapons/Explosive Safety Manager. 460 SW/SE would be the Office of Primary Responsibility (OPR) and have ultimate authority in deeming when the area is cleared and safe to conduct all activities in this area.

The Proposed Action, an Alternative Action A and the No Action Alternative were assessed in an EA, which is incorporated herein by reference.

DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, once 460 SW/SE clears the area for unexploded ordnance concerns, approximately 200 cottonwood and 200 willow trees in and along the southern portion of East Tollgate Creek near the active runway would be removed. The trees would be cut down to 1-foot above ground level and their root systems left in place to protect against erosion. In addition, because the area is located within a 100-year floodplain, BMPs will be utilized to minimize impact or disturbance of the soil banks of East Tollgate Creek. Additionally, any damage to the soil banks of East Tollgate Creek that were caused by the tree removal would be corrected. All tree waste generated

during the Proposed Action would be recycled in compliance with AFI 32-7080, *Pollution Prevention Program*. Figure 1-2 presents the Proposed Action location.

Care would be taken to avoid a 'take' of an avian species in violation of the Migratory Bird Treaty Act (MBTA). "Take" is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. In the event that cutting would occur during the nesting period, March 15 through July 15, trees would be surveyed by a qualified wildlife biologist to determine if birds are currently nesting. If birds are nesting in the area, trees would be selectively cut to avoid damaging active nests. The remaining trees would then be cut after the young have fledged and nests are vacated.

Heavy equipment would not cross the stream channel and the work would not be conducted when the ground is saturated or muddy in order to avoid rutting from heavy equipment. Creek bank BMPs would be utilized to avoid potential erosion from the tree removal activities. Specific methods would be determined prior to field activities and coordinated through 460 CES/CEV.

SUMMARY OF ALTERNATIVES TO THE PROPOSED ACTION

Alternative A: Under Alternative A, the trees would remain in their current location; however, once 460 SW/SE allows access to the area, BASH measures in the form of pyrotechnics and other harassment activities would be increased and expanded beyond what is currently in use. These activities would be conducted within the 100-year floodplain. Per AFPAM 91-212, pyrotechnics are noise-producing devices, which are effective in bird dispersal. Authorized forms include scare cartridges, bangers, and screamers. Scare cartridges are commercially available, fired from a 12-gauge shotgun, and upon detonation produce a loud noise. Pyrotechnics can be used to flush and direct flocks of birds in a desired direction, and close coordination with the control tower would be required so birds would not be directed into the path of arriving or departing aircraft. Coordination with base security forces would also be conducted prior to using pyrotechnics.

No Action Alternative: Under the No Action Alternative, the current level and use of pyrotechnics and firearms would continue to be used to attempt to deter birds and other wildlife from the airfield.

In addition, alternatives to top or prune and selectively cut the trees were also considered, but eliminated from further review.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS

Analyses performed in the EA addressed potential effects of the Proposed Action, Alternative A, and the No Action Alternative on MMRP, safety, soils, water resources, and biological resources. The analyses indicate that implementing the Proposed Action would have no significant direct, indirect, or cumulative effects on the quality of the natural or human environment.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

Based on the provisions set forth in the Proposed Action, all activities were found to comply with criteria or standards of environmental quality and coordinated with Federal, Tribal, state, and local agencies. The Draft EA and Draft FONSI was made available to Federal, Tribal, state, and local agencies and to the public for a 30-day review period beginning 01 December 2010 and ending 30 December 2010.

FINDING OF NO SIGNIFICANT IMPACT

Reasonable alternatives to the Proposed Action were considered. The Proposed Action was found to be the preferred alternative to meet Buckley AFB's purposes and needs. After review of the EA, prepared in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and the Environmental Impact Analysis Process (32 Code of Federal Regulations [CFR] 989, as amended). I have determined that neither the Proposed Action nor Alternative A would have a significant impact on the

quality of the human or natural environment. An Environmental Impact Statement will not be prepared. This decision has been made after taking into account all submitted information and considering a full range of alternatives that would meet project requirements and are within the legal authority of the USAF.

FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)


Implementation of either the Proposed Action or Alternative A will conform to Executive Order (EO) 11990, which requires federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Implementation of either the Proposed Action or Alternative A will also conform to EO 11988, which requires federal agencies to take actions to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

Tree removal and creek bank repair at the Proposed Action site could cause minor disturbance to the 100-year floodplain associated with East Tollgate Creek. There are identified wetlands near the area of the proposed action, but impacts to the wetlands are expected to be minimal. No fill material would be placed in or around the wetlands. In addition, no draining, dredging, channelizing, filling, diking, impounding, and related activities would occur within the wetlands. Erosion and sediment control BMPs will be required for tree removal activities. The BMPs that would be utilized include minimizing the number of personnel working in and around the creek bed during cutting, limiting the number of trips to the proposed project area by chipping on site, removing the wood debris (wood chips and branches) to the maximum extent possible, prohibiting vehicles within the creek bed, and having a single controlled access point for personnel and vehicles to access the proposed project area. Additional BMPs would also include repairing and revegetating using native grass seeds and or erosion blankets for any rutting or soil disturbance caused by vehicles and equipment. There would be no net loss of wetlands.

As a result of the Proposed Action, there would be no filling or modification such that people or structures would be exposed to flooding. In addition, there would be no permanent occupancy or direct or indirect modification of the floodplain. The Proposed Action would not adversely affect the functions of the floodplain or increase flood risk. The activities associated with removing the trees would not violate National Flood Insurance Program requirements or result in changes that would increase an existing floodway or the flood elevation level associated with the 100-year flood event. Under the Proposed Action, there would be no permanent effects on floodplains.

Alternative A would be conducted within the 100-year floodplain but would have no impact to the floodplain or wetlands associated with East Tollgate Creek, as this area of the creek has been utilized for training activities in the past where both personnel and equipment have operated without observed adverse impacts on East Tollgate Creek. BMPs to minimize the impacts from increased trips to the area by personnel and vehicles on the 100-year floodplain would be to utilize the existing pathways for vehicles to allow personnel access to the tree covered area of East Tollgate Creek and prohibiting personnel and vehicles from entering the boundary of the floodplain and creek bed. This Alternative to the proposed action is the least attractive course of action, because it would still leave a permanent bird proximal hazard to flight safety in place, as the trees provide an attractive perching and roosting habitat for various bird species, including large raptors commonly observed in and around the tree removal area.

Pursuant to EOs 11990 and 11988, the authority delegated by SAFO 780-1, and 32 CFR Part 989, and taking the submitted information into account, I find that there is no practicable alternative to this action, and the Proposed Action and Alternative A include all practical measures to minimize harm to the environment.


JOSEPH H. SCHWARZ, Colonel, USAF
Deputy Director for Installations
and Mission Support

22 March 2011
Date

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OF THE
REDUCE BASH HAZARDS ALONG EAST TOLLGATE CREEK
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ABBREVIATIONS AND ACRONYMS

140 WG	140 th Wing, Colorado Air National Guard	FEMA	Federal Emergency Management Agency
460 SW	460 th Space Wing	FONPA	Finding of No Practical Alternative
AF	Air Force	FONSI	Finding of No Significant Impact
AFB	Air Force Base	FY	fiscal year
AFI	Air Force Instruction	gpd	gallons per day
AFPAM	Air Force Pamphlet	HAZMART	Hazardous Materials Pharmacy
agl	above ground level	l/day	liters per day
ANGB	Air National Guard Base	MBTA	Migratory Bird Treaty Act
BASH	Bird Aircraft Strike Hazard	MD	munitions debris
BGEPA	Bald and Golden Eagle Protection Act	MEC	munitions and explosives of concern
BMP	Best Management Practice	MMRP	Military Munitions Response Program
CAA	Clean Air Act	MRS	munitions response site
CDOW	Colorado Division of Wildlife	MS4	Municipal Separate Storm Sewer Systems
CEQ	Council on Environmental Quality	MSDS	material safety data sheets
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act	MSGP	Multi-Sector General Permit
CES/CEV	Civil Engineering Squadron/Environmental Flight	NAAQS	National Ambient Air Quality Standards
CFR	Code of Federal Regulations	NEPA	National Environmental Policy Act
cfs	cubic feet per second	NOI	Notice of Intent
CGP	Construction General Permit	NPDES	National Pollutant Discharge Elimination System
CO₂	carbon dioxide	NRHP	National Register of Historic Places
COANG	Colorado Air National Guard	OHWM	ordinary high water mark
CWA	Clean Water Act	OPR	Office of Primary Responsibility
DDESB	Defense Department Explosive Safety Board	OSHA	Occupational Safety and Health Administration
DoD	Department of Defense	PEM	palustrine emergent
EA	Environmental Assessment	PPE	Personal Protective Equipment
EO	Executive Order	PSS	palustrine scrub-shrub
ERP	Environmental Restoration Program	RCRA	Resource Conservation and Recovery Act
ESA	Endangered Species Act		
ETL	Engineering Technical Letter		
FAA	Federal Aviation Administration		

ROI	Region of Influence	USAF	United States Air Force
SHPO	State Historic Preservation Officer	USDA	U.S. Department of Agriculture
SWMP	Stormwater Management Plan	USEPA	United States Environmental Protection Agency
SWPPP	Stormwater Pollution Prevention Plan	USFWS	U.S. Fish and Wildlife Service
URS	URS Group, Inc.	UXO	unexploded ordnance
USACE	U.S. Army Corps of Engineers		

1. INTRODUCTION

This Environmental Assessment (EA) to Reduce Bird Aircraft Strike Hazard (BASH) Hazards Along East Tollgate Creek presents the Proposed Action to cut trees in order to reduce BASH habitat attractants. The EA will be made available for public and agency review and comment. As a result of the assessment, a Finding of No Significant Impact (FONSI) and Finding of No Practical Alternative (FONPA) have been prepared and are included for public review.

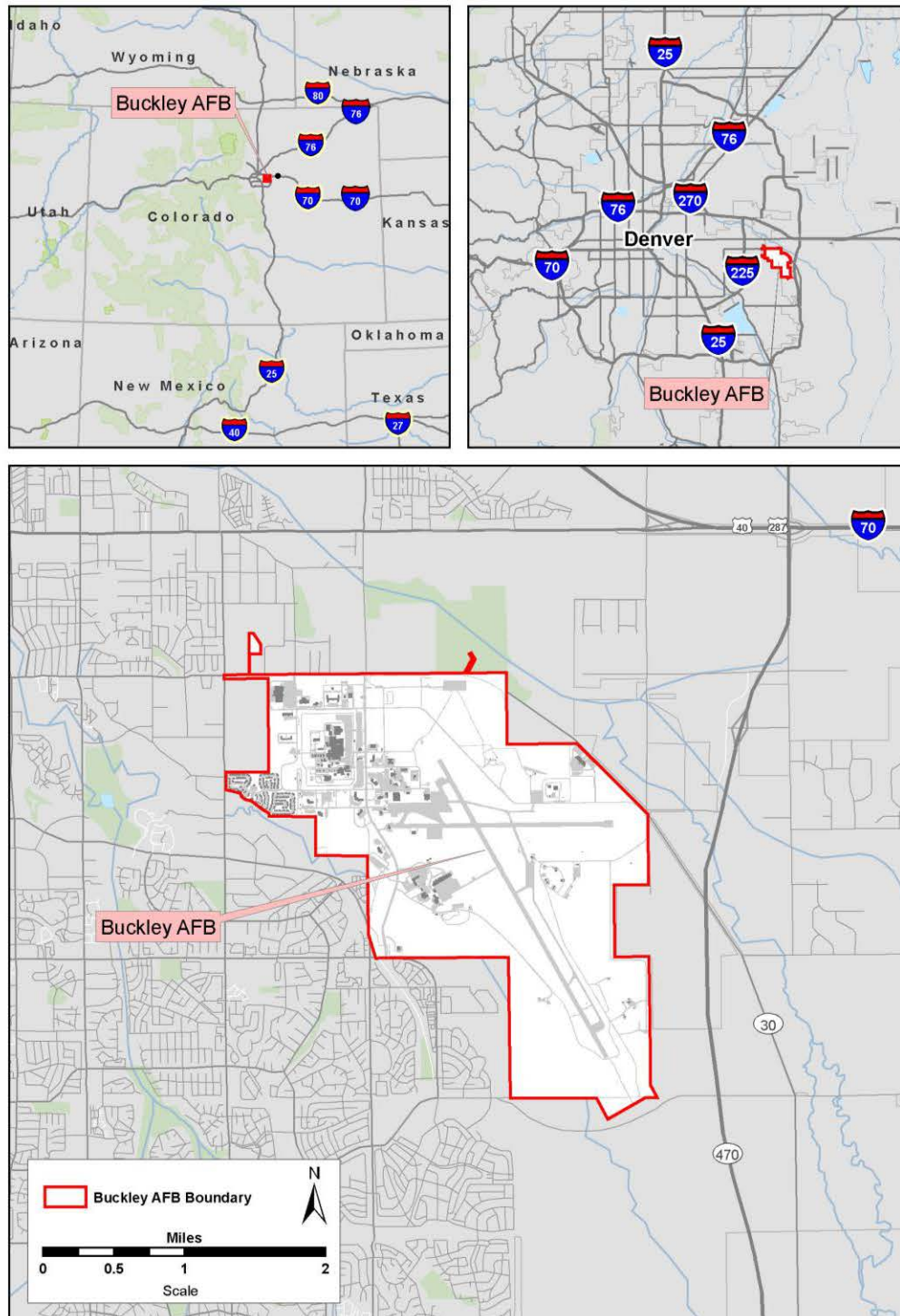
Federal agencies are required to consider the environmental consequences of proposed actions in the decisionmaking process under the National Environmental Policy Act (NEPA) of 1969 (42 United States Code Sections 4321 to 4370d) and the Council on Environmental Quality's (CEQ) implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508). This EA to reduce BASH hazards along East Tollgate Creek of Buckley Air Force Base (AFB) was prepared in accordance with NEPA. This EA evaluates the potential environmental impacts of activities associated with the cutting down of trees in the creek at the southwest end of the flightline. The Buckley AFB East Tollgate Creek tree removal project would include light deforestation and creek bank Best Management Practices (BMPs) and repair activities. The site of the Proposed Action is situated within a location designated as a Military Munitions Response Program (MMRP) Unexploded Ordnance (UXO) Disposal Area. To ensure safety risks are identified and controlled in this area, per the Defense Department Explosive Safety Board (DDESB) DoD 6055.09-STD, C14.5.1, access to this area is currently restricted to authorized personnel. No actions proposed within this EA would proceed without prior approval and clearance from 460 SW/SE Weapons/Explosive Safety Manager. 460 SW/SE would be the Office of Primary Responsibility (OPR) and have ultimate authority in deeming when the area is cleared and safe to conduct all activities in this area.

1.1 BACKGROUND

Buckley AFB occupies approximately 3,283 acres (1,328 hectares) adjacent to the city of Aurora, Arapahoe County, Colorado, within the Denver metropolitan area (Figure 1-1). Buckley Field was first used by the military for training during World War II, and then the Colorado Air National Guard (COANG) acquired use of Buckley Field in 1946. After ownership by the Department of the Navy from 1947 to 1959, COANG resumed use of the installation in 1959. In October 2000, Buckley Air National Guard Base (ANGB) was realigned and became an AFB under the 821st Space Group. The 460th Space Wing (460 SW) is the current host of Buckley AFB (BAFB 2010a).

The mission of the 460 SW is to deliver global infrared surveillance, tracking missile warning for theater and homeland defense and provide combatant commanders with expeditionary warrior Airmen. The vision is, "Total vigilance, warrior culture and strong community." In addition to the mission of the 460 SW, a wide range of other missions are performed at Buckley AFB including flight training, support for transient military aircraft, and space-related initiatives by a variety of tenants including active-duty, National Guard, and Reserve personnel from the United States Air Force (USAF), Army, Navy, and Marine Corps. The 140th Wing (140 WG) of the COANG operates and manages the only active military airfield in the Denver metropolitan area as a tenant at Buckley AFB (BAFB 2010a).

Figure 1-1. Buckley AFB Vicinity Map



Buckley AFB currently supports more than 92,000 plus people throughout the Front Range community. This includes 3,156 active duty members from every service, 3,300 National Guard personnel and Reservists, 3,800 civilians, 2,400 contractors, and 36,000 retirees and approximately 40,000 veterans and dependents. The base contributes an estimated \$1.11 billion annually to the local economy (BAFB 2010a).

The following section describes the purpose of and need for the Proposed Action at Buckley AFB, provides summaries of the scope of the environmental review and the applicable regulatory requirements, and presents an overview of the organization of the document.

1.2 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Aircraft collisions with birds and other wildlife annually cause millions of dollars in aircraft damage and may result in loss of life and aircraft. More than 200 people have been killed worldwide as a result of wildlife strikes with aircraft since 1988, according to Bird Strike Committee USA, more than 5,000 bird-strikes were reported by the USAF in 2007. Bird strikes, or the collision of an aircraft with an airborne bird, tend to happen when aircraft are close to the ground, just before landing or after take-off, when jet engines are turning at top speeds. The incidents are serious, particularly when the birds, usually gulls, raptors and geese, are sucked into a jet engine and strike an engine fan blade. That impact displaces the blade such that it strikes another blade causing a cascade, resulting in engine failure. Bird and other wildlife strikes to aircraft result in more than \$600 million in damage a year, according to Bird Strike Committee USA (LiveScience 2009). The Federal Aviation Administration (FAA) Wildlife Strike Database (FAA 2010) and the Air Force Safety Automated System (AFSAS [AFSAS 2011]) lists 35 incidents that have been reported at Buckley AFB since 2005. These incidents are presented in Table 1-1 below.

Table 1-1. BASH Incidents Reported Since 2005 at Buckley AFB

Incident Date	Incident Month	Incident Year	Time of Day	Time	Species	Size
3/1/2005 0:00	3	2005	Day	1350	Unknown bird or bat	Medium
3/2/2005 0:00	3	2005	Day	1548	Unknown bird or bat	Medium
4/14/2005 0:00	4	2005	Day	1208	American kestrel	Small
5/11/2005 0:00	5	2005	Day	1345	Western meadowlark	Small
6/22/2005 0:00	6	2005	Day	1000	Mourning dove	Small
7/7/2005 0:00	7	2005	Day	1440	Mourning dove	Small
9/26/2005 0:00	9	2005	Day	806	Unknown bird or bat	Medium
10/26/2005 0:00	10	2005	Dusk	1715	Red-winged blackbird	Small
11/16/2005 0:00	11	2005	Day	1426	Horned lark	Small
1/12/2006 0:00	1	2006	Day	1529	Horned lark	Small
4/13/2006 0:00	4	2006	Day	1400	Horned lark	Small
4/13/2006 0:00	4	2006	Day	930	Horned lark	Small
6/8/2006 0:00	6	2006	Day	1535	Mourning dove	Small
10/10/2006 0:00	10	2006	Day	1144	Mourning dove	Small
10/19/2006 0:00	10	2006	Day	958	Horned lark	Small
11/2/2006 0:00	11	2006	Night	1930	Horned lark	Small
5/11/2007 0:00	5	2007	Day	845	Horned lark	Small

Table 1-1. BASH Incidents Reported Since 2005 at Buckley AFB

Incident Date	Incident Month	Incident Year	Time of Day	Time	Species	Size
7/11/2007 0:00	7	2007	Day	1030	Horned lark	Small
07/13/2007	7	2007	Day	940	American kestrel	Small
090/4/2007	9	2007	Day	1030	House finch	Small
09/05/2007	9	2007	Day	1230	Horned lark	Small
10/05/2007	10	2007	Day	855	Horned lark	Small
10/06/2007	10	2007	Day	920	Horned lark	Small
03/12/2008	3	2008	Day	1035	Horned lark	Small
07/14/2008	7	2008	Day	1105	Unknown bird or bat	Medium
08/06/2008	8	2008	Day	900	Unknown bird or bat	Medium
09/09/2008	9	2008	Day	1045	American kestrel	Small
01/29/2009*	1	2009	Night		Unknown bird or bat	Small
01/30/2009	1	2009	Dusk	1733	Canada goose	Large
05/04/2010	5	2010	Day	900	Horned Lark	Small
05/06/2010	5	2010	Day	905	Mourning Dove	Small
06/01/2010	6	2010	Day	1335	Horned Lark	Small
06/25/2010	6	2010	Day	1020	Western Meadowlark	Small
08/04/2010*	8	2010			Bat	Small
10/24/2010*	10	2010	Night		Unknown bird or bat	Small

Source: FAA Wildlife Strike Database 2010 and Air Force Safety Automated System 2010

*A strike was recorded on this date but complete data is not available

Control methods are available to reduce these losses and must be implemented by all Air Force (AF), Air National Guard and U.S. Air Force Reserve units that plan, support or are engaged in flying missions. Birds and other hazardous wildlife on runways, taxiways, or infields create a potential safety hazard and should be dispersed before flying operations can safely continue. Birds move quickly and unpredictably, and even when left in a “safe” portion of the airfield, they can move and create an immediate hazard. The AF has determined that no single method of dispersal works for all problems, and that using a combination of different dispersal tools provides the best line of defense for immediate hazards. Pyrotechnics, bioacoustics, passive controls, and, if necessary, lethal control have been effective in dispersing wildlife from airfields (Air Force Pamphlet [AFPAM] 91-212).

The area along East Tollgate Creek to the west of the southern portion of the flightline has been identified by the 460 SW in coordination with the 140 WG as an ongoing BASH concern. In May 2008, a representative from the USAF BASH Team conducted a two-day technical assistance visit at Buckley AFB. As a result of the visit, and in conjunction with observations and recommendations derived from discussions with personnel from the 460 SW and 140 WG, the trees located southwest of the runway along East Tollgate Creek were identified as a wildlife issue concerning flight safety. The Deputy Chief of the USAF BASH Team recommended removal of the stand of trees in the area identified. This area is also within a 100-year floodplain. The presence of the birds adjacent to the Buckley AFB flightline is incompatible with the 140 WG flying mission because birds and other wildlife on runways, taxiways, or infields create potential safety hazards. As a precautionary measure, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport’s air operations area and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or

departure airspace (FAA 2007). Air Force Instruction (AFI) 91-202, *The U.S. Air Force Mishap Prevention Program*, Section 7.11.2 describes responsibilities for base-level BASH programs. Additionally, AFI 32-7064, *Integrated Natural Resources Management*, Chapter 14 states that:

‘All aspects of installation natural resources management must be reviewed for potential wildlife hazards to aircraft operations. The land adjacent to aircraft operations areas must be managed to minimize attractions to wildlife.’

The current environment of this portion of East Tollgate Creek includes Eastern cottonwood and sandbar willow (approximately 200 each). This approximately 1.5-acre site is just outside of the airfield fenceline but within the 5 statute miles used by the FAA as a precautionary distance within which to minimize hazardous wildlife attractants. Although wildlife activities vary with the seasons, the trees provide a favorable habitat for various bird species. The mature trees in this area are between 60 and 80 years old. Trees often intermingle as they mature, forming a continuous canopy whose dense foliage attracts birds and is ideal for providing shelter, food, and nesting areas. Specific wildlife species with a potential to occur in the area are further described in Section 3.5.3. To show the extent of the safety flight risks, the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service Wildlife Services representative tasked to implement BASH wildlife controls at Buckley AFB noted that in 2009, there were 42 Bald Eagle, 6 Golden Eagle, 504 hawk, 74 falcons and 4 owl harassments (consisting of noise deterrents such as pyrotechnics) conducted primarily in the area of East Tollgate Creek (Bell 2010). Although BASH incidents have decreased within the last few years, current BASH controls in this portion of East Tollgate Creek, including pyrotechnics and firearms, have not been successful in reducing the BASH hazards in the area. The presence of the trees and the more than 600 birds in and along East Tollgate Creek create an ongoing safety hazard for the flying mission.

The purpose of the Proposed Action is to reduce the number of birds near the airfield. The removal of trees, which provide potential roosting habitat for birds, is a means to do so. The need of the Proposed Action is to reduce flight safety risk. The Proposed Action would support the BASH program and meet the AF goal of reducing the loss of life and of valuable aircraft and other resources. Figure 1-2 presents the proposed area of deforestation.

1.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The Draft EA will be made available for tribal, agency, and public review and comment. If the analyses presented in the EA indicate that the Proposed Action and Alternatives would result in no significant environmental or socioeconomic impacts, a FONSI and FONPA will be prepared. If the analyses reveal the potential for significant environmental impacts that cannot be reduced to insignificance, an Environmental Impact Statement would be prepared or no action would be taken.

In compliance with NEPA, CEQ, and USAF regulations and guidelines, this document focuses on those conditions and resource areas that are potentially subject to impacts. These resources include the Environmental Restoration Program (ERP), safety, soils, water, and biological resources. Some environmental resources and conditions that are often analyzed in an EA have been eliminated from analysis or review. The following paragraphs identify these resource areas and the basis for such exclusions:

- **Air Quality** – The Clean Air Act (CAA) authorized United States Environmental Protection Agency (USEPA) to delegate responsibility for ensuring compliance with National Ambient Air Quality Standards (NAAQS) to the states and local agencies. As such, each state develops air pollutant control programs and promulgates regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in state

implementation plans that must be developed by each state or local regulatory agency and approved by USEPA. The Proposed Action could impact air quality to the extent that motorized equipment would be used during tree removal and creek bank repair and dust would be generated. With the implementation of BMPs for fugitive dust, implementation of this project is expected to contribute no more than negligible impacts on air quality.

The CAA requires that USEPA promulgate general conformity regulations. These regulations are designed to ensure that Federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and the promulgated regulations, found in 40 CFR Part 93, exempt certain Federal actions from conformity determinations (e.g., contaminated site cleanup and natural emergency response activities). A conformity analysis must be performed prior to commencement of a Federal action that generates air pollutants in a region that has been designated as “nonattainment” or “maintenance” for one or more of the NAAQS. The USEPA has assigned the Denver metropolitan area, including Buckley AFB as in attainment/maintenance for particulate matter and carbon monoxide, and nonattainment for ozone. General Conformity under the CAA, Section 176 has been evaluated for the Proposed Action according to the requirements of 40 CFR 93, Subpart B. The maximum annual total direct and indirect emissions of this action have been estimated according to the Buckley AFB General Conformity Management Strategy and the requirements of 40 CFR 93, Subpart B. Emissions from this action are listed in the following table. These levels are below the 100 tpy conformity threshold value established by 40 CFR 93.153(b) for the Denver Air Quality Control Region maintenance area.

Table 1-2 EMISSIONS FROM PROPOSED ACTION

Maintenance Area	Pollutant	Applicable Conformity Threshold Values (tons per year – tpy)	Regionally Significant Emission Levels (tpy)	Maximum Annual Emissions from “large” Proposed Action (tpy) ¹
Ozone	NO _x or NO ₂	100	11,278	Less than 10
	VOC	100	16,790	Less than 4
PM ₁₀	PM ₁₀	100	3,215	Less than 14
CO	CO	100	67,817	Less than 33

Gases that trap heat in the atmosphere are often called greenhouse gases. One greenhouse gas, carbon dioxide (CO₂), occurs naturally and is emitted to the atmosphere through natural processes and human activities. Trees remove CO₂ from the atmosphere during photosynthesis to form carbohydrates that are used in plant function and return oxygen back to the atmosphere as a byproduct. Trees therefore act as a carbon sink by removing the carbon and storing it as cellulose in their trunk, branches, leaves and roots while releasing oxygen back into the air. The elimination of the carbon sink (i.e., trees) and subsequent reduction of greenhouse gas uptake could in-turn increase greenhouse gases. However, the level of greenhouse gases in the atmosphere as a result of removing the trees would be no more than negligible on either a local or regional level. Accordingly, the USAF has eliminated detailed examination of air quality.

- **Airspace Management** – Although the Proposed Action and Alternatives addresses safety concerns with respect to the Buckley AFB flying mission, the flying mission in regard to airspace

management would be unaffected and there would be no new impacts on airspace. Accordingly, the USAF has eliminated detailed examination of airspace management.

- **Cultural Resources** – Buckley AFB has undergone four separate cultural resources surveys since 1983, which cumulatively evaluated all areas of the installation with the exception of portions of the 152 acres within the fenced high security area (BAFB 2002, BAFB 2004a). Cultural resources identified in these combined surveys included a number of lithic scatters, foundations of historic properties, trash dumps, and a railroad spur line, none of which were considered eligible for the National Register of Historic Places (NRHP); and six buildings that are eligible for the NRHP. None of these buildings are in the location of the Proposed Action or Alternatives. The Colorado State Historic Preservation Officer (SHPO) has previously concurred that no significant archaeological resources have been identified at Buckley AFB.

The implementation of the Proposed Action does not lead to any actions that have the potential to significantly affect cultural resources, tribal resources, tribal rights, or Indian lands. Should any cultural or archeological resources be uncovered during implementation of the Proposed Action, work would stop and the site would be evaluated prior to the continuation of the project. Tribal and SHPO representatives would be notified immediately. Accordingly, the USAF has eliminated detailed examination of cultural resources, including historic structures and buildings, archaeological resources, and tribal resources.

- **Geology** – The Proposed Action and Action Alternative would not involve major excavation or drilling that would impact subsurface geological structures. Soils are analyzed in Section 3.3.1.

Hazardous Waste and Materials (Excluding the ERP Program) – The Proposed Action and Action Alternative would have no or a negligible effect on hazardous waste and materials management. There would be no new chemicals or toxic substances used or stored at Buckley AFB. It is anticipated that the quantity of products containing hazardous materials used and wastes generated during the tree removal and creek bank repair activities would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal and state regulations. Contractors must report use of hazardous materials to the Hazardous Materials Pharmacy (HAZMART) including pertinent information (e.g., material safety data sheets [MSDS]), and contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, as well as the installation's Hazardous Waste Management Plan. Best management practices (BMPs) would be followed to ensure that contamination from a spill does not occur. If, however, an oil spill occurs, the Spill Prevention Control and Countermeasures Plan would outline the appropriate measures for oil spill situations.

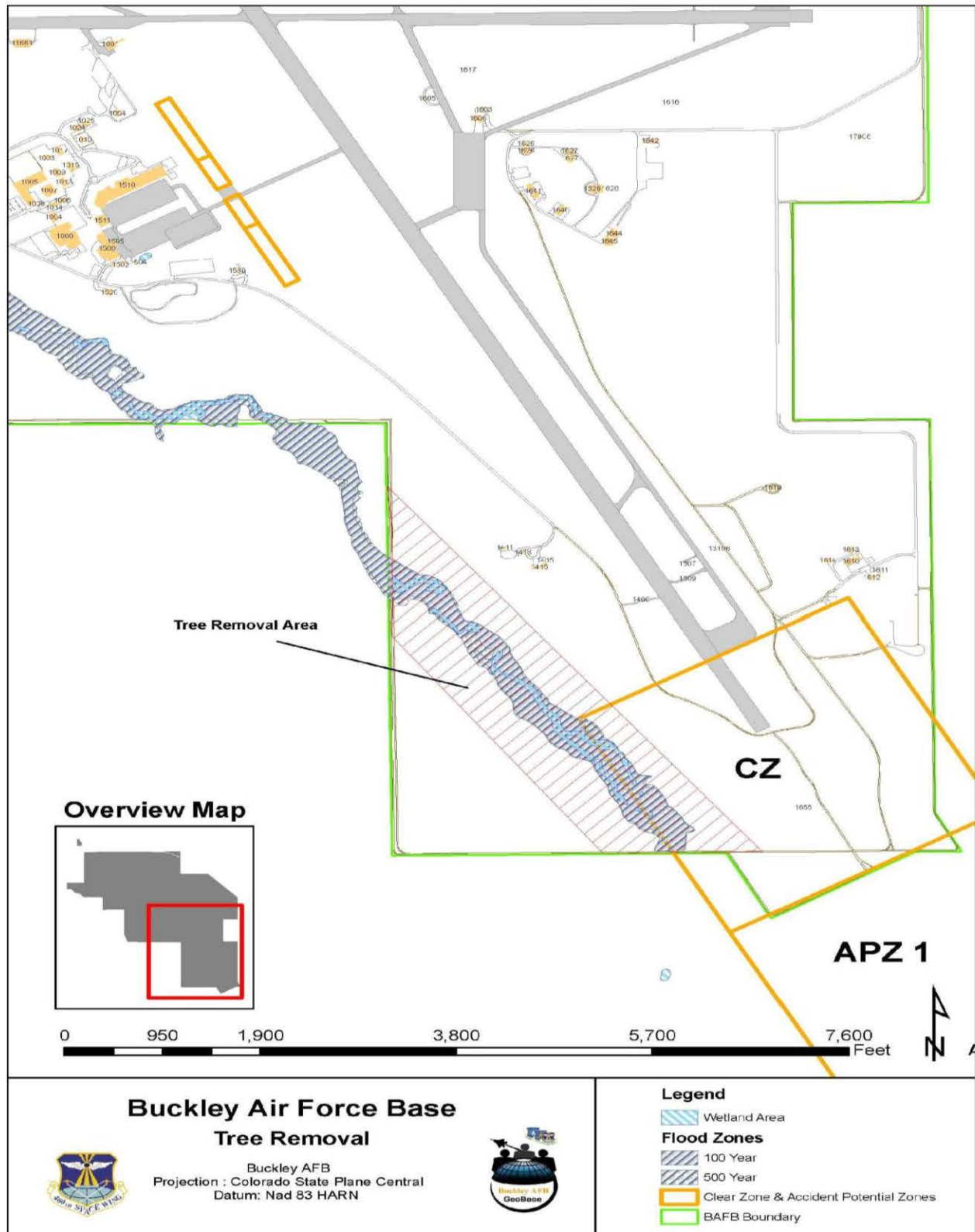


Figure 1-2. Buckley AFB Overview Map

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- **Land Use** – Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its “permanence.”

Buckley AFB occupies approximately 3,283 acres (1,328 hectares) adjacent to the city of Aurora, Arapahoe County, Colorado, within the Denver metropolitan area. Developed areas, including residential, commercial, and light industrial, border the installation to the west and northwest. Along the northern boundary of the installation are light industrial and open space (e.g., grassland conservation) areas. Land uses bordering the installation to the east are primarily recreation and agriculture at present. Land use for this eastern border is anticipated to shift to industrial/commercial to the northeast and residential to the southwest. Regional Park and Open Space designations are proposed for areas immediately south of the installation. The East Tollgate Creek 100-year floodplain borders the installation to the southwest and provides a buffer between the developed areas and the installation boundary (BAFB 2005).

The Proposed Action and Action Alternative would take place within the East Tollgate Creek 100-year floodplain borders, but neither would alter the land use because the area would remain in a semi-naturalized state and act as a buffer between the neighboring developed areas and the installation. Therefore, there would be no potential for adverse impacts from tree removal or bank repair activities on infrastructure or land use.

- **Noise** – The Proposed Action could impact noise levels to the extent that motorized equipment would be used during tree removal. All tree removal and bank repair activities would be conducted during daytime business hours and this project is expected to contribute no more than negligible impacts on noise levels. The Action Alternative implements the use of pyrotechnics, which are noise-producing devices, but their use would be infrequent and thus expected to contribute no more than negligible impacts on noise levels in comparison to the pyrotechnic activities from the nearby airfield and noise generated from aircraft on the airfield.
- **Socioeconomics and Environmental Justice** – It is assumed that local landscaping or construction crews would be used for the tree removal and creek bank repair with the Preferred Alternative. These activities would not significantly impact employment levels or economic indicators in the Region of Influence (ROI). Additionally, the Proposed Action does not have the possibility to disproportionately affect low-income or minority residents. The footprint of the Proposed Action would be relatively small and would therefore have a minimal impact on the adjacent areas. The census tract that contains Buckley AFB and the tract directly adjacent to the installation do not have a disproportionately high percentage of minorities or low-income inhabitants. The Action Alternative would utilize existing personnel resources and would not require an increase in staff or manpower at Buckley AFB. Therefore, there would be no potential for adverse impacts from construction or operation activities on any low-income or minority populations.
- **Utilities** – The area of the Proposed Action and Action Alternative does not currently include any utility lines or equipment. The Proposed Action would not alter this status and therefore, there would be no potential for adverse impacts from tree removal or creek bank repair activities on any utilities.

1.4 SUMMARY OF KEY ENVIRONMENTAL COMPLIANCE REQUIREMENTS

This EA is documentation of the Environmental Impact Analysis Process (32 CFR Part 989), and complies with NEPA, CEQ regulations, and Department of Defense (DoD) Instruction 4715.9, *Environmental Planning and Analysis*. The EA addresses all applicable Federal, state, and local laws and regulations, including the CAA; AFI 32-7040, *Air Quality Compliance*; Executive Order (EO) 11990, *Protection of Wetlands*; EO 11988, *Floodplain Management*; EO 12898, *Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations*; EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*; Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA); Endangered Species Act (ESA); EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*; and the Migratory Bird Treaty Act (MBTA).

In accordance with the National Pollutant Discharge Elimination System (NPDES) requirements, a site-specific Stormwater Pollution Prevention Plan (SWPPP), including sediment- and erosion-control measures, would be developed and implemented for tree removal activities. A Notice of Intent (NOI) would be filed to obtain coverage under the USEPA Storm Water Construction General Permit (CGP). A fugitive dust permit would not be required for the Proposed Action as the impact area for the deforestation is below the 25-acre limit, beyond which a fugitive dust permit would be needed.

1.5 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This EA is organized as follows:

Acronyms and Abbreviations: provides a list of acronyms and abbreviations used throughout the document.

Section 1 – Introduction: Purpose and Need for the Proposed Action: provides background information about the installation, the purpose and need for the Proposed Action, the scope of the environmental review, applicable regulatory requirements, and a brief description of how the document is organized.

Section 2 – Description of the Proposed Action and Alternatives: provides the selection criteria; a detailed description of the Proposed Action, Action Alternatives, and the No Action Alternative; other alternatives that were considered but not carried forward in the evaluation process; and an alternatives comparison table.

Section 3 – Affected Environment and Environmental Consequences: provides a description of the existing conditions of the areas potentially affected by the Proposed Action, Action Alternatives, and the No Action Alternative; and an analysis of the direct and indirect project impacts on resources from the Proposed Action, Action Alternatives, and the No Action Alternative.

Section 4 – Cumulative Impacts: provides an analysis of present and reasonably foreseeable projects, and the potential incremental impacts of the Proposed Action, Action Alternatives, and the No Action Alternative when considered along with these other planned or reasonably foreseeable projects.

Section 5 – List of Preparers: provides a list of the document preparers and contributors.

Section 6 – References: provides a listing of the references used in preparing this EA.

Section 7 –Distribution List and Agencies and Individuals Contacted: provides lists of agencies and individuals to whom this EA will be distributed and the agencies and individuals who were contacted for information in the preparation of this document.

Appendix A - Air Force Form (AF) 813, Request for Environmental Impact Analysis

Appendix B – Notice of Availability and Affidavit of Publication

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2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section identifies selection criteria, and provides a detailed description of the Proposed Action, Action Alternatives, and the No Action Alternative for the proposed tree removal. In addition, a comparison of how the alternatives meet the selection criteria is provided at the end of this section.

2.1 IDENTIFICATION OF SELECTION CRITERIA

In an effort to satisfy the purpose and need for the Proposed Action, criteria were developed to compare and contrast alternative ways of fulfilling the objectives of the Proposed Action in accordance with 32 CFR 989.8(c).

Selection criteria for the Proposed Action include:

- Proposed Action would reduce identified potential BASH hazards associated with an area within East Tollgate Creek near the airfield to increase the safety for aircrews participating in the flying mission personnel working on-base, and residents in neighboring communities;
- Proposed Action would reduce identified potential BASH hazards along East Tollgate Creek near the airfield to further an AF goal of reducing monetary expenses associated with the loss of aircraft as a result of a bird/wildlife collision;
- Proposed Action would not violate the MBTA;
- Proposed Action would remove or significantly reduce roosting/perching attractants for birds or the presence of birds near the Buckley AFB airfield; and,
- Proposed Action would minimize impacts to the floodplain.

2.2 DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, once 460 SW/SE clears the area for vehicles and personnel to operate safely due to potential UXO in the area, approximately 200 cottonwood trees ranging from a few inches in diameter at breast height to over 20 inches in diameter at breast height would be removed by cutting. Additionally, approximately 200 willow trees, generally less than 3 inches in diameter, would also be removed by cutting to allow access to the cottonwood trees in and along the southern portion of East Tollgate Creek near the active runway of the BAFB airfield. The trees would be cut down to a maximum 1-foot above ground level (agl) and their root systems left in place to protect against erosion. In addition, because the area is located within a 100-year floodplain, BMPs would be utilized to minimize impact or disturbance of the soil banks of East Tollgate Creek. Specifically, the BMPs that would be utilized to minimize impacts to the creek's soil banks, in addition to leaving the root systems intact, would be to minimize the number of personnel working in and around the creek bed during cutting, limit the number of trips to the proposed project area by chipping on site, remove the wood debris (wood chips and branches) prohibit vehicles within the creek bed, and have a single controlled access point for personnel and vehicles to access the proposed project area. Additionally, repairing and revegetating would be done, using native grass seeds and or erosion blankets, to repair any rutting or soil disturbance caused by vehicles and equipment. All tree waste generated during the Proposed Action would be recycled in compliance with AFI 32-7080, *Pollution Prevention Program*. Trees would be chipped and used for landscaping material on base. Figure 1-2 presents the Proposed Action location.

Care would be taken to avoid a 'take' of an avian species in violation of the MBTA. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. Birds protected under the act include all common songbirds, waterfowl, shorebirds, hawks, owls, eagles, ravens, crows, native doves and pigeons, swifts, martins, swallows and others, including their body parts (feathers, plumes, etc.), nests, and eggs. A complete list of protected species is found at 50 CFR 10.13 *Code of Federal Regulations List of Migratory Birds*.

In the event that cutting would occur during the nesting period, March 15 through July 15, trees would be surveyed by a qualified wildlife biologist to determine if birds are currently nesting. If birds are nesting in the area, trees would be selectively cut to avoid damaging active nests. The remaining trees would then be cut after the young have fledged and nests are vacated.

Heavy equipment would not cross the stream channel and the work would not be conducted when the ground is saturated or muddy in order to avoid rutting from heavy equipment. Creek bank BMPs would be utilized to avoid potential erosion from the tree removal activities. Specific methods would be determined prior to field activities and coordinated through 460 CES/CEV.

2.3 DESCRIPTION OF ACTION ALTERNATIVE A

Under Action Alternative A, the trees would remain in their current location; however, once 460 SW/SE allows access to the area, BASH measures in the form of pyrotechnics and other harassment activities would be increased and expanded beyond what is currently in use. Per AFPAM 91-212, pyrotechnics are noise-producing devices, which are effective in bird dispersal. Authorized forms include scare cartridges, bangers, and screamers. Scare cartridges are commercially available, fired from a 12-gauge shotgun, and upon detonation produce a loud noise. Bangers and screamers do not have the range of the 12-gauge cartridges, but they are fired from a 15mm launcher, which is not considered a weapon. The banger provides a loud report, whereas the screamer makes a shrill whistle. Pyrotechnics can be used to flush and direct flocks of birds in a desired direction, and close coordination with the control tower would be required so birds would be not directed into the path of arriving or departing aircraft. Coordination with base security forces would also be conducted prior to using pyrotechnics. Best management practices (BMPs) to minimize the impacts from increased trips to the area by personnel and vehicles on the 100-year floodplain would be to utilize the existing pathways for vehicles to allow personnel access to the tree covered area of East Tollgate Creek and prohibiting personnel and vehicles from entering the boundary of the floodplain and creek bed.

Harassment and monitoring activities are currently utilized throughout the base under a MBTA permit. Under this alternative, these activities conducted by existing staff would be increased and expanded within the area identified in Figure 1-2.

2.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the trees would not be removed and additional BASH measures would not be implemented. Under the No Action Alternative, the current level and use of pyrotechnics and firearms would continue to be used to attempt to deter birds and other wildlife from the airfield.

This document refers to the continuation of existing (i.e., baseline) conditions of the affected environment, without implementation of the Proposed Action, as the No Action Alternative. The No Action Alternative serves as a benchmark against which Federal actions can be evaluated. Inclusion of a No Action Alternative is prescribed by CEQ regulations and, therefore, will be carried forward for further

analysis in this EA. The No Action Alternative would result in continuing safety concerns for the flying mission, and not fully implement the guidance of AFPAM 91-212.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER REVIEW

Topping or pruning the trees was considered as a method of removing or thinning the roosting/perching habitats for the birds. This alternative would not eliminate habitat attractants for birds that nest below the top canopy of the trees. Topping the trees could still retain raptor habitat or even enhance denning habitat. In addition, the action would only provide a temporary solution as the tree canopy would grow back in subsequent season. Because this alternative did not provide a solution that would significantly reduce roosting/perching attractants, this alternative was eliminated from further review.

Selectively cutting the cottonwoods trees and allowing willow trees to remain was considered as a method that would remove the roosting habitat while minimizing effects to the stream banks and vegetation. Because many of the cottonwoods would be inaccessible without also removing the willows growing near the cottonwoods, this alternative was deemed impractical. Leaving the willow trees in place is also not practical from a worker safety prospective as it would not allow adequate work space for personnel working in area of the proposed cottonwood removal. Comparison of Alternatives

Table 2-1 illustrates the Proposed Action, Action Alternative A, and the No Action Alternative as they relate to the selection criteria presented in Section 2.1. Only the Proposed Action meets all four of the selection criteria.

Table 2-1. Comparison of Alternatives with Selection Criteria

Selection Criterion	Proposed Action	Alternative A	No Action Alternative
Action would reduce <i>identified</i> BASH hazards associated with an area within East Tollgate Creek within Buckley AFB, near the airfield, in order to increase the safety for both aircrews in the flying mission, and neighboring communities	Yes	Yes	No
Action would reduce <i>identified</i> BASH hazards along East Tollgate Creek near the airfield in order to further the AF goal of reducing monetary expenses associated with the loss of aircraft as a result of a bird/wildlife collision	Yes	Yes	No
Action would not violate the Migratory Bird Treaty Act	Yes	Yes	Yes
Proposed Action would remove or significantly reduce roosting/perching attractants for birds or the presence of birds near the Buckley AFB airfield	Yes	Yes	No
Action would minimize impacts to the floodplain	Yes	Yes	Yes

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3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the current conditions for and anticipated impacts on those resources which might be impacted by the Proposed Action including MMRP, safety, soils, water resources, and biological resources. The definitions for impact intensity thresholds from lowest to greatest used in this document are:

- Negligible. Impacts on the resource, although anticipated, could be difficult to observe and are not measurable
- Minor. Impacts on the resource would be detectable upon close scrutiny or would result in small but measurable changes to the resource
- Moderate. Impacts on the resource would be easily observed and measurable, but would be localized or short-term
- Major. Impacts on the resource would be easily observed and measurable, widespread, and long-term.

The definitions for duration of impacts used in this document are

- Short-term. Impacts are not anticipated to last for more than 1 to 2 years
- Long-term. Impacts are anticipated to last for more than 2 years

The definition of significant used in this document is:

- The degree to which the Proposed Action affects public health or safety
- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the ESA
- Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment
- An impact that would present a high degree to which the possible effects on the human or natural environment are highly uncertain or involve unique or unknown risks; or
- An impact that would present a high degree of adverse impact on the human or natural environment

3.1 MILITARY MUNITIONS RESPONSE PROGRAM

3.1.1 Affected Environment

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, the DoD has dictated that all facilities develop and implement their own Environmental Restoration Program (ERP), intended to facilitate thorough investigation and cleanup of contaminated sites on military installations. Through the ERP, DoD evaluates and cleans up sites where hazardous wastes and/or hazardous substances have been spilled or released to the environment. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, control the migration of contaminants, minimize potential hazards to human health and the environment, and clean up contamination. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be restricted until remediation of a groundwater contaminant plume has been completed). These plans and programs, in addition to established legislation (i.e., CERCLA and RCRA), effectively form the “safety net” intended to protect the ecosystems on which most living organisms depend. The ERP is also responsible for munitions clean up from closed historic training ranges. The program that implements and governs DoD and Air Force munitions cleanup activities is the Military Munitions Response Program.

Military Munitions Response Program (MMRP). MMRP addresses issues related to munitions and explosives of concern (MEC), chemical warfare material, and munitions constituents associated with munitions response areas, as well as related hazardous substances, pollutants, and potential contaminants of concern on other-than-operational ranges. Phase I and Phase II Comprehensive Site Evaluation activities were performed at Buckley from 2005–2008. To date, a total of 17 munitions response areas have been investigated during the Comprehensive Site Evaluation process. Eight of these received a no further action decision at the conclusion of the Comprehensive Site Evaluation Phase I. The nine remaining munitions response areas were evaluated during the Comprehensive Site Evaluation Phase II. At the conclusion of Phase II, these munitions response areas were divided into 15 munitions response sites (MRSs), all but one of which (TS102) was recommended for further evaluation. An Engineering Evaluation Cost/Analysis for the 14 MRSs was finalized in February 2009 with up to four alternatives evaluated for each MRS. A removal action was initiated in November 2009 with subsurface anomaly investigations and surface clearance completed for all MRSs with the exception of MB103 (BAFB 2010b). Figure 3-1 shows the locations of open MMRP sites.

The Proposed Action is situated within a region designated as MMRP Site MB103, the UXO Disposal Area that was in use from the 1940s and into the 1990s. A “popping” furnace was used for the disposal of small arms, and training and maneuvering activities took place in the area (USACE 2010). Munitions debris (MD) and MEC were disposed of in the area (BAFB 2010b). Surface clearance and subsurface investigations were performed at this MRS during a contracted removal action effort. Figure 3-2, taken from the Preliminary Findings and recommendations report, illustrates the extent of buried waste in the vicinity of the Proposed Action. To date, over 2,000 items (482 pounds) of MD have been found at depths up to 10 inches at Site MB103 (USACE 2010). The preliminary recommendation of the report is that although the removal work at MB103 is not complete, this MRS could proceed to the next phase. No MEC items were found, and work in East Tollgate Creek in MB103 has not been completed.

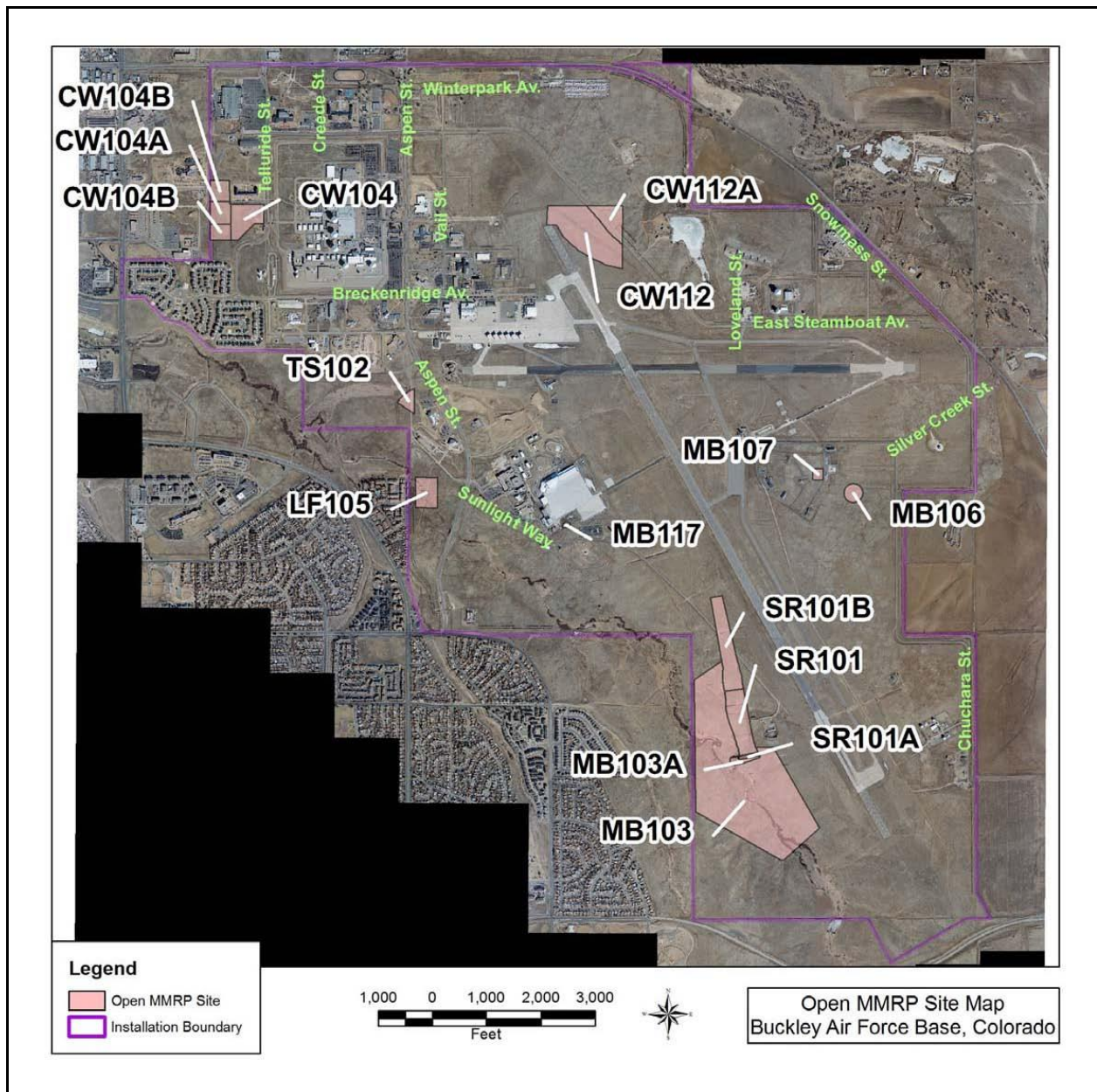


Figure 3-1. Location of Open MMRP Sites

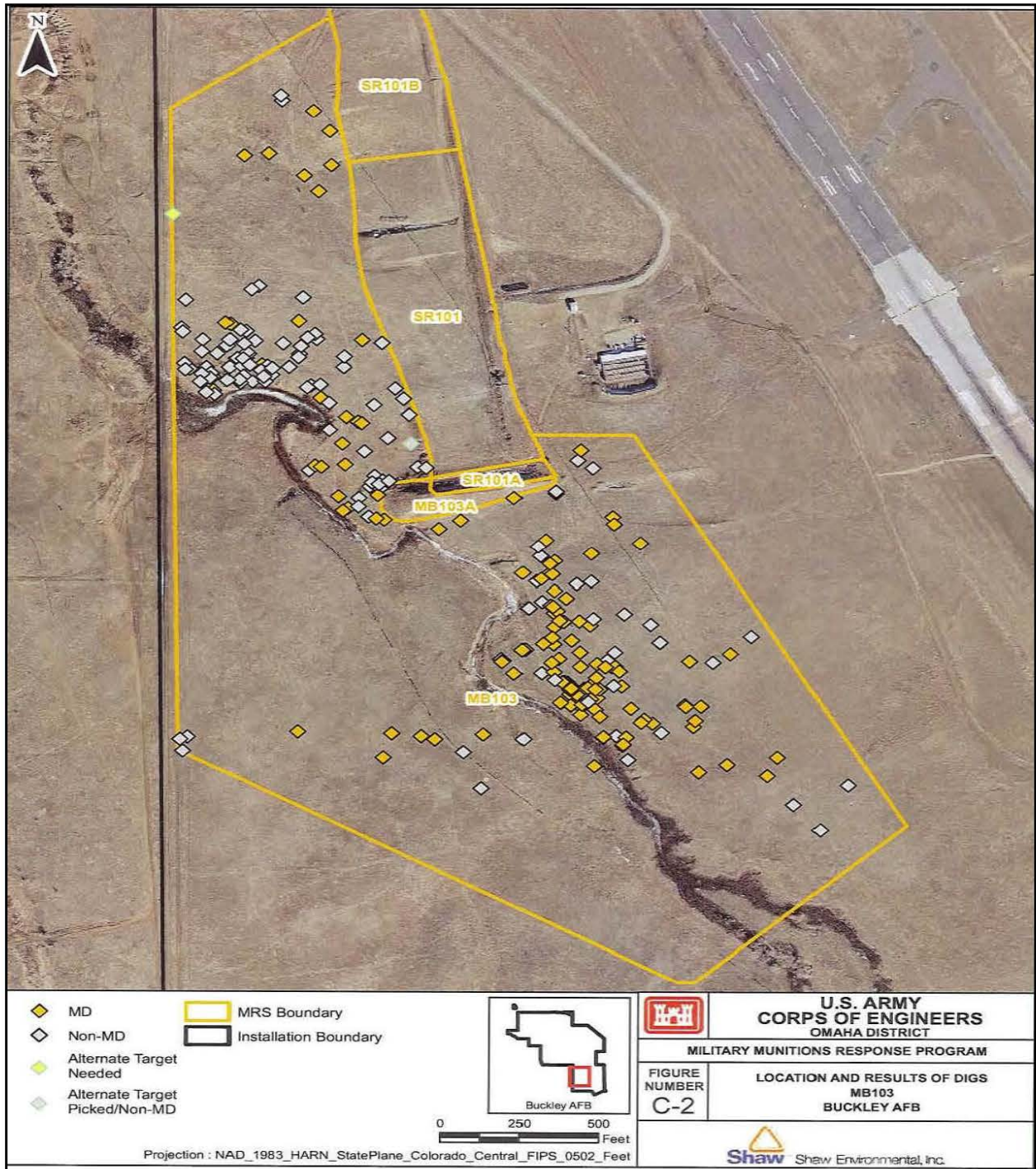


Figure 3-2. Extent of Buried Waste

Defense Department Explosive Safety Board (DDESB). DDESB's mission is to provide objective advice to the Secretary of Defense and Service Secretaries on matters concerning explosives safety and to prevent hazardous conditions to life and property on and off DoD installations from the explosives and environmental effects of DoD titled munitions. Per DDESB DoD 6055.09-STD, C14.5.1, access to MMRP Site MB103 area is currently restricted to authorized personnel. No actions can proceed without prior approval and clearance from 460 SW/SE Weapons/Explosive Safety Manager. 460 SW/SE has ultimate authority in deeming when the area is cleared and safe to conduct all activities in this area.

3.1.2 Impacts

Proposed Action

The Proposed Action would overlap ERP Site MB103 illustrated in Figure 3-2. Issues and concerns regarding this ERP site are related to the occurrence of UXOs in the Proposed Action area. UXO may be found fully intact or in fragments. All UXOs, whether intact or in fragments, present potential hazards. For work to occur in this area it must first be fully approved by 460 SW/SE. Because the Proposed Action would not be implemented until (per DDESB guidance) the 460 SW/SE clears the area as safe for construction activities and allows access to the area, the potential for inadvertent detonation would be greatly reduced. With proper safety protocols in place, any potential short-term, adverse impacts from UXOs would be negligible.

Action Alternative A

Under Alternative A, harassment activities would not be conducted in the creekbed of East Tollgate Creek within Site MB103. However, personnel would work in areas around the creekbed to harass the birds. As in the Proposed Action, the Alternative A would not be fully implemented until the 460 SW/SE clears the area as safe for harassment activities and allows access to the area, the potential for inadvertent detonation would be greatly reduced. With proper safety protocols in place, any potential adverse impacts from UXOs would be short-term and negligible.

No Action Alternative

No effects would be expected under the No Action Alternative. No BASH measures currently take place on any ERP sites without 460 SW/SE approval.

3.2 SAFETY

3.2.1 Affected Environment

Safety concerns are twofold: mission-related and landscaping/construction-related.

East Tollgate Creek to the west of the installation runway includes approximately 200 cottonwood trees that provide a favorable habitat for various bird species. Also, there are approximately 200 willow trees in the area that also provide favorable habitat for various bird species and also present a physical barrier for personnel accessing the cottonwood trees for the purpose of removing the cottonwood trees. The foliage of the tree canopy is ideal for providing shelter, food, perching, and nesting areas.

According to the AF BASH Program, between fiscal year (FY) 1973 through FY2009 bird strikes accounted for the loss of 35 lives and 45 military aircraft at a cost of hundreds of millions of dollars (<http://www.afsc.af.mil/organizations/bash/statistics.asp>). Data from the BASH Program also indicate that several of the bird species known to inhabit the area of East Tollgate Creek are significant (in the top 50) contributors to the safety hazards for air crews and aircraft (AFSC 2009, 2010).

All contractors performing tree removal and creek bank repair activities are responsible for following ground safety and Occupational Safety and Health Administration (OSHA) regulations and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment (PPE), and use and availability of MSDS. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplaces; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures or engaged in hazardous waste work.

The proposed tree removal area is within ERP Site MB103 which is described in detail in Section 3.1.1.

3.2.2 Impacts

Proposed Action

Mission

Eliminating the roosting/perching habitat located in close proximity to the flightline would reduce certain bird populations currently attracted to this habitat. Impacts related to eliminating the attractant would be beneficial, moderate, and long-term.

The removal of the tree canopy within the bed of East Tollgate Creek directly adjacent to the active runway of the BAFB airfield could increase open water habitat that would be present during wet seasons, however, removing the trees in this section of the creek would not greatly increase total area of open water in this portion of East Tollgate Creek since the majority of this portion of the creek is currently not covered by trees. Also, East Tollgate Creek is an intermittent stream that at times of the year has no ponding or flowing water as observed as recently as October 2010. Any ponding or open water in the proposed tree removal area created from removing the trees would depend on rain and snow events but would not greatly increase the open water in the area which could attract other bird species such as waterfowl species.

Biological field surveys conducted in June 2010 determined that, although hawks were present and active in the area, there were no hawk, eagle, or owl nests within the cottonwood trees proposed to be cut (URS 2010). However, inactive raptor nests were removed from the trees in the proposed removal area in December 2009 and raptors, such as Red Tailed Hawks and Great Horned Owls, are known to frequently forage in the area and have been observed on many occasions by BAFB, 140 WG, and USDA personnel directly over the proposed tree removal area and also perching the trees to be removed. Tree removal would not completely eliminate the habitat attractant for these species because they potentially nest within the large cottonwood trees outside of the fence of Buckley AFB south of the project area but removing the trees would prevent perching and nesting habitat in close proximity to the active runway. Hawks, eagles and owls feed on small animals like rabbits, mice, snakes and small birds. The rabbits, mice, snakes etc. would still be present for the hawks to forage on. However, removing the trees in this section of East Tollgate Creek will remove one proximal bird habitat and attractant. This would be one step toward increasing flight safety for BAFB and the 140 WG and thus any open water attractant for waterfowl would be considered a minimal flight safety and mission impact both the short-term and long-term.

Landscaping/construction

Implementation of the Proposed Action would slightly increase the short-term risk associated with landscape/construction contractors performing work at Buckley AFB during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Adverse impacts would be short-term, and negligible.

Action Alternative A

Mission

If dispersed away from the flight zone, dispersal of the bird populations would increase the overall safety of the 140 WG flying mission. Because the effects of the harassment activities would be short-term, the activities would need to be coordinated with flight schedules and repeated continuously. Impacts would be beneficial, short-term and moderate for as long as the harassment would continue. However, personnel limitations might reduce Buckley AFB's ability to commit to on-going harassment in areas outside of the airfield fenceline.

Implementing BASH pyrotechnic measures would require firing cartridges from a shotgun or launcher. However, these are noise-generating devices, not weapons, and appropriate hearing PPE would be required. Thus safety concerns would be negligible.

No Action Alternative

No trees would be removed and no change in BASH activities would take place. Birds would continue to be attracted to the area and pose safety risks for the flight mission.

3.3 SOILS

3.3.1 Affected Environment

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. The major soil-mapping units present on Buckley AFB include the Fondis-Weld, Alluvial Land-Nunn, and Renohill-Buick-Little associations (USDA/SCS 1971). Other areas on the installation have been identified as gravel pits, rock outcrop complexes, sandy alluvial land, and terrace escarpments (USDA/SCS 1971).

The Alluvial Land-Nunn association consists of soils that have moderate permeability (0.63 inch per hour) and high water-holding capacity (0.20 inch per inch of soil), and are typically found along floodplains and terraces. On installation, these soils are found along Tollgate Creek and Sand Creek. These soils are deep, nearly level, loamy, and sandy soils. These soils support crops well, but flood protection is needed to prevent erosion and gully formation. The most common soil types in this association are the Nunn-Bresser Ascalon and the Nunn Loam series, both of which have moderate permeability (0.63 to 6.3 inches per hour) and high water-holding capacity (0.20 inch per inch of soil). Both are typically well-drained, gently sloping soils (0 to 3 percent slope) (USDA/SCS 1971).

3.3.2 Impacts

Proposed Action

The Proposed Action would remove approximately 200 cottonwood and 200 willow trees in and along East Tollgate Creek. Under the Proposed Action, the trees would only be cut down to 1-foot agl, leaving the root systems intact. The tree root systems from the cottonwoods and willows act as natural soil stabilizers and prevent erosion of the creek bank. These remaining root wads would continue to stabilize the area of East Tollgate Creek with similar effectiveness as if the trees were left fully intact. In addition to leaving the cottonwood and willow root systems intact, standard BMPs outlined in Section 2.2 will be used. The BMPs to be utilized include minimizing the number of personnel working in and around the creek bed during cutting, limiting the number of trips to the proposed project area by chipping on site, removing the wood debris (wood chips and branches) to the maximum extent possible, prohibiting vehicles within the creek bed, and having a single, controlled access point for personnel and vehicles to access the proposed project area. Additional BMPs would also include repairing and revegetating using native grass seeds and/or erosion blankets for any rutting or soil disturbance caused by vehicles and equipment. Implementing the Proposed Action is anticipated to be adverse, short-term, and negligible to minor.

Action Alternative A

No impacts on soils are anticipated as a result of implementing Action Alternative A.

No Action Alternative

There would be no impacts on soils under the No Action Alternative.

3.4 WATER RESOURCES

3.4.1 Affected Environment

Groundwater. Groundwater consists of subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications.

Buckley AFB is within the Denver Basin groundwater basin. There are four major bedrock aquifers that underlie Buckley AFB within the Denver Basin: the Denver, Upper Arapahoe, Lower Arapahoe, and Laramie-Fox Hills aquifers. These aquifers are separated by a bed of shale with low permeability and are located in zones of sandstones and siltstones (USGS 1995).

Surficial aquifers at Buckley AFB are associated with present and ancestral surficial stream and river valleys. The aquifer systems are the result of alluvial deposition from erosion of upland bedrock areas. The alluvial aquifer identified on Buckley AFB is associated with Tollgate and Sand creeks and consists of primarily coarse-grained materials. Groundwater is recharged to this aquifer through direct infiltration of precipitation and irrigation water and by lateral and upward seepage of groundwater. Groundwater is discharged from the alluvial aquifer through seepage to streams, evapotranspiration, downward seepage into underlying bedrock aquifers, and extraction via pumping wells. Groundwater flow in these surficial aquifers is generally toward the north-northwest along creekbeds, toward the South Platte River (BAFB 2004b).

Surface Waters. Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Storm water flows, which can be exacerbated by high proportions of impervious surfaces associated with

buildings, roads, and parking lots, are important to management of surface water. Storm water is also important to surface water quality because of the potential to introduce sediments and other contaminants into lakes, rivers, and streams. Storm water systems convey precipitation away from developed sites to appropriate receiving surface waters. For several reasons, storm water systems can employ a variety of devices to slow the movement of water. For instance, a large, sudden flow could scour a streambed and harm biological resources in that habitat. Storm water systems provide the benefit of reducing amounts of sediments and other contaminants that would otherwise flow directly into surface waters. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event would often lead to downstream flooding and the environmental and economic damages associated with flooding. As a general rule, areas with higher densities of development, such as urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur in urban centers.

The South Platte River, approximately 15 miles (27.8 km) northwest of Buckley AFB, is the primary surface water drainage in the region. Several smaller intermittent tributaries within or adjacent to Buckley AFB feed this drainage system. Off-installation tributaries include Sand Creek to the north and northeast, and Murphy Creek to the east. East Tollgate Creek, an intermittent stream, is in the western section of the installation.

The most prominent surface water feature on the installation is Williams Lake, a man-made lake in the northeastern section of the installation (BAFB 2004b).

The proposed project includes a portion of East Tollgate Creek, an intermittent/perennial creek that forms a confluence with Sand Creek approximately 7 miles north of the project site. The creek lies within Hydrologic Unit Code 10190003 (USGS 2007). In June 2010 URS Group Inc. (URS) conducted a survey of a portion of the proposed tree removal site at East Tollgate Creek. The width of the creek within the proposed project ranges from between 8 and 20 feet wide, generally meandering northward with naturally occurring pools throughout. The channel substrate is unconsolidated and stream banks are trapezoidal with bank sloughing evident throughout. Some terracing occurs within the channel from bank erosion. Hydrology varies throughout the reach, ranging from interstitial (subsurface) flow to slow flows within defined channels. Some portions of the reach are ponded with no visible flow at periods of the year coinciding with rain and snow events. The reach exhibits an ordinary high water mark (OHWM) throughout most of the proposed project. Depth to the OHWM averages 2.8 feet. Water quality is clear at the southern end of the reach, becoming more turbid to the north. At the time of observation, the channel was experiencing base flows, but rafting, bank erosion, and downcutting indicate evidence of high velocity event flows. The channel is constricted through a culvert at the northern end of the proposed project.

The existing flow rate of East Tollgate Creek at Mississippi Boulevard is 85 cubic feet per second per acre (cfs/acre) (636 gallons per second per acre), and watershed modeling for Buckley AFB predicts the future flow rate to increase to approximately 140 cfs/acre (1,048 gallons per second per acre) based on the amount of development that has taken place at the installation (BAFB 2010c). The seasonal discharge of East Tollgate Creek during December and March has been measured at 216,000 liters per day (l/day) (57,061 gallons per day [gpd]) (USGS 2007). Field investigation of the drainage infrastructure of Buckley AFB determined that problems exist on the installation that could hinder water flow and potentially cause flooding (BAFB 2010c). These findings include silt accumulation in culverts and swales, clogged stormwater inlets, and head cutting resulting in erosion. Head cutting is where active erosion is caused by a sudden change in slope of a streambed resulting in turbulence that undercuts the substrate and causes the upper level of the streambed to collapse.

Stormwater. On Buckley AFB, stormwater regulations are under the purview of USEPA, as the agency responsible for regulatory enforcement on Federal facilities in the state of Colorado. USEPA's stormwater regulations consist of three permit programs.

The General Permit for Stormwater Discharges from Construction Activities (CGP or CGP Program) has the objective of preventing pollutants on construction sites (e.g., sediment) from being transported off site by stormwater runoff. The CGP is applicable to projects that disturb an area 1 acre or more in size, and requires that an NOI be obtained by both the contractor doing the construction work and the owner/operator responsible for directing the work, per the definitions in the CGP. In addition to applying for an NOI, the CGP requires each project to develop and implement an SWPPP. The SWPPP includes BMPs for erosion and sediment control, control of waste at the site, self-inspection/monitoring, and reporting efforts.

The purpose of the NPDES Stormwater Multi-Sector General Permit (MSGP) for Industrial Activities Program is to identify, permit, and limit stormwater discharges from nonpoint sources associated with activities of industries specified in the regulation that are or have the potential to carry industrial pollutants in the runoff. Presently, discharges associated with the MSGP Sector L (landfills) and Sector S (air transportation) industries are permitted under Buckley AFB's MSGP. The MSGP is not applicable to the tree removal project because it is not associated with either of these industry sectors.

The General Permit for Stormwater Discharges from Federal Facility Small Municipal Separate Storm Sewer Systems (MS4) in Colorado Program provides an overall management and compliance program for the owners and operators of stormwater conveyance systems. Requirements of the MS4 program include preparation and implementation of a Stormwater Management Plan (SWMP). The SWMP identifies BMPs that address each of six minimum control measures, which include construction site stormwater runoff control and post-construction stormwater management in new development/redevelopment.

Buckley AFB holds active permits under all three of these USEPA stormwater programs. In addition to the USEPA permit program requirements, the USAF mandates compliance with Engineering Technical Letter (ETL) 03-01: Stormwater Construction Standards. Storm water runoff from the Proposed Action site would drain to East Tollgate Creek.

Floodplains. Floodplains are defined as areas along a linear surface water feature (e.g., stream, creek, or river) that are inundated by the water leaving its banks. Floodplains are important because they temporarily store floodwaters, improve water quality, provide important habitat for wildlife, and create opportunities for recreation. Typically, in the United States, rivers have a 100-year floodplain, or an area that is inundated by a 100-year flooding event. The Federal Emergency Management Agency (FEMA) has designated the 100-year floodplain as an area in which construction activities are regulated. FEMA prints 100-year floodplain maps that show the floodplain for rivers in the United States. FEMA maps are based on historic events and insurance claims. Figure 1-2 presents the location and extent of floodplains on and adjacent to Buckley AFB. The Proposed Action is within the floodplain associated with East Tollgate Creek.

3.4.2 Impacts

Infiltration rates, the process by which surface water enters the soil to groundwater, are most largely determined by the physical parameters of the soil type (BAFB 2010c). The area of the Proposed Action is undeveloped and is therefore considered pervious to water. Other factors affecting the hydrology of the area include the width and slope of streambeds, in this case East Tollgate Creek.

Transpiration is the process by which plants take in groundwater from their roots and carry it through to the leaves, where it evaporates to the atmosphere. Cottonwood and willow forests transpire large quantities of water from groundwater aquifers, ranging from 200-500 l/day (53-132 gpd) for each mature cottonwood trees and from 30-100 l/day (8-26.5 gpd) for each willow trees (Schaeffer et al. 2000).

Man-made parameters influencing surface water flow and drainage include culverts, storm sewer outlets, swales, and detention areas. Construction BMPs would be implemented for the Proposed Action to decrease sedimentation by erosion by implementing creek bank repair. Common BMPs for construction and demolition activities would be followed to minimize erosion.

Proposed Action

Groundwater

Selection of the Proposed Action would remove approximately 200 Eastern cottonwood and 200 willow from East Tollgate Creek. Assuming a ratio of 75/25 for the presence of these species, respectively, this would reduce the depletion of the aquifer by 8,315 gpd (minimum) to 21,120 gpd (maximum).

Groundwater aquifers replenish their water supply very slowly and draw from a wide area for recharge. The recharge gained by the removal of the trees is expected to have minor, long-term, beneficial impacts on groundwater.

Depth to groundwater is greater than 20 feet (6.1 meters) below ground surface (BAFB 2010c). Therefore, it is not expected that groundwater would be impacted during creek bank repair activities under the Proposed Action.

Surface Water

Because the cottonwood and willow transpire from the shallow aquifer, the surface water would not be adversely impacted from cutting the trees. Vegetative systems are natural soil stabilizers and prevent erosion. Under the Proposed Action, the trees would be cut down to 1-foot agl and their root systems left in place, thus creating root wads which are natural channel stabilizers that allow the continued natural establishment of the existing deep-rooted vegetative system. Therefore, impacts to surface water associated with construction activities would be adverse, short-term and negligible.

Storm Water

Potential impacts to surface waters include disruption of natural drainage patterns, contamination entering storm water discharge, or sediment loading from construction (bank repair) activities. Preparing and implementing a SWPPP would minimize adverse impacts. These plans provide construction and post-construction BMPs intended to control and manage the loading of sediment and other pollutants to levels that would minimize degradation of downstream water quality.

The pervious surfaces on the installation would not be altered or reduced as a consequence of removing the trees or stabilizing the creek bank; therefore, the Proposed Action would not impact storm water volume.

Floodplains

As a result of the Proposed Action, there would be no filling or modification such that people or structures would be exposed to flooding. In addition, there would be no permanent occupancy or direct or indirect modification of the floodplain. The Proposed Action would not adversely affect the functions of

the floodplain or increase flood risk. The activities associated with removing the trees would not violate National Flood Insurance Program requirements or result in changes that would increase an existing floodway or the flood elevation level associated with the 100-year flood event. Under the Proposed Action, there would be no permanent effects on floodplains.

During construction, vehicles would follow existing access roads, but some construction equipment may be staged in the floodplain area. Impacts to the floodplain would be reduced by limiting the staging area to the smallest possible footprint and for the shortest amount of time required for tree removal activities. The equipment staging areas would be a temporary occupancy that, in the event of a 100-year flood, could modify the natural flow within the floodplain until the equipment is moved. Impacts from construction activities in the event of a 100-year flood would be short-term, adverse and negligible because any changes to the natural flow would be difficult to observe and not measurable.

Action Alternative A

Action Alternative A comprises implementation of BASH pyrotechnic harassment measures. Personnel deploying pyrotechnics would have to drive to this area to make it practical to access this area of the base and also have to walk within floodplain areas in order to access the bird habitat area. Technicians would drive on pre-existing designated access routes and then exit the vehicles to walk to specific harassment sites. Although these activities would be ongoing, they would not modify or disrupt the natural flow of the floodplain. This area of the base has been used historically for training activities where both vehicles and personnel have operated in this area and has had minimal to no impact on the creek. Accordingly, Action Alternative A would have no adverse impacts on water resources of the installation.

No Action Alternative

The No Action Alternative would have no impacts on water resources of the installation.

3.5 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals, and the habitats, forests, and grasslands, in which they exist. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or a state, migratory birds protected by the MBTA and eagles protected by the Bald and Golden Eagle Protection Act (BGEPA).

Biological resources also include wetlands, which are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, providing wildlife habitat, supporting unique and niche flora and fauna, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are protected as a subset of the “waters of the United States” under Section 404 of the Clean Water Act (CWA). The U.S. Army Corps of Engineers (USACE) defines wetlands as “those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support—and under normal circumstances do support—a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (33 CFR 328). EO 11990, *Protection of Wetlands*, directs Federal agencies to avoid destruction or modification of wetlands whenever there is a practicable alternative.

This section describes the affected environment for vegetation; wetlands; native and nonnative wildlife; and threatened, endangered, and other sensitive species known or likely to occur at Buckley AFB, and potential impacts on those resources for the Proposed Action and Alternative. This analysis is based on

site visits conducted by URS in June 2010, as well as literature and previous surveys conducted at Buckley AFB. Impacts were assessed by comparison of the footprint of the tree removal and creek bank repair activities to the biological resources described under the Affected Environment section for each resource. The measures proposed to offset impacts are based on standard methods and actions recommended by wildlife management agencies and organizations.

3.5.1 Vegetation

3.5.1.1 Affected Environment

Buckley AFB is in the Great Plains-Palouse Dry Steppe Province Ecoregion (Bailey 1995), an ecoregion also classified as shortgrass prairie (BAFB 2004b). Vegetative communities within the proposed project are disturbed/short grass prairie upland, woody riparian, and palustrine emergent (PEM) and palustrine scrub-shrub (PSS) wetland. Disturbed/short-grass prairie upland is comprised of greater than 50 percent non-native or noxious weed species with a component of short grass prairie grasses and forbs. Typical species included Canada thistle (*Cirsium arvense*), Western wheatgrass (*Pascopyrum smithii*), dalmatian toadflax (*Lineria dalmatica*), Western salsify (*Tragopogon dubius*), Western wallflower (*Erysium asperum*), rabbitbrush (*Chrysothamnus nauseous*), prickly-pear cactus (*Opuntia polyacantha*), yucca (*Yucca glauca*), fringed sage (*Artemesia ludoviciana*), margined stickseed (*Lappula marginata*), cutleaf evening primrose (*Oenothera albicaulis*), leafy spurge (*Euphorbia esula*), pennycress (*Thalspi arvense*), scarlet globemallow (*Sphaeralcea coccinea*), and white beardtongue (*Penstemon albidus*).

Due to creek morphology and loose erodible soils, banks range from sparsely to well vegetated. Banks were typically weedy, populated with Canada thistle and annual weedy species. Woody riparian vegetation included Eastern cottonwood (*Populus deltoides*), sandbar willow (*Salix exigua*), green ash (*Fraxinus pennsylvanica*), golden currant (*Ribes aureum*), and Russian olive (*Eleagnus angustifolia*).

3.5.1.2 Impacts

Proposed Action

Under the Proposed Action, Eastern cottonwood and willows would be cut down to 1-foot agl and their root systems left intact. The willows would regenerate from their intact root systems as the willow root systems would remain alive. However, the cottonwood tree root systems would die. Revegetation would occur at the locations of East Tollgate Creek that undergo bank repair. These areas would be seeded with native grasses as soon as possible after repair is complete. While there would be direct adverse impacts to the individual trees that are cut down, the loss of these trees on an installation or regional level would be barely noticeable and negligible. The tree removal within the project area would be easily observed and measurable, but would be localized. Impacts on a base level would be localized, adverse, long-term and minor.

Action Alternative A

No impacts on vegetation would occur as a result of implementing the Action Alternative A.

No Action Alternative

No impacts on vegetation would occur as a result of implementing the No Action Alternative.

3.5.2 Wetlands

3.5.2.1 Affected Environment

Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the CWA and EO 11990, *Protection of Wetlands*. Wetlands are defined by the USACE and the USEPA as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR § 328.3[b]). Wetlands are protected as a subset of the waters of the U.S. under Section 404 of the CWA; the USACE requires a permit for any activities crossing wetlands or other waters of the U.S.

A base-wide jurisdictional wetlands determination by the USACE has not been completed for Buckley AFB (BAFB 2010d). National Wetland Inventory maps identify a total of six wetland areas on the base. Most of the wetlands occur in the vicinity of East Toll Gate Creek in the undeveloped southwestern part of the base. In the northeast part of Buckley AFB, there are two wetlands associated with an unnamed tributary of Sand Creek, as well as wetland areas adjacent to Williams Lake (BAFB 2003, 2010d). Of these wetlands, only those along East Tollgate Creek (the site of the Proposed Action) site (Figure 1-2) are susceptible to impacts from the tree removal and subsequent creek bank repair activities. When present, wetland vegetation occurred completely within the confines of the channel. Wetland species are predominantly sandbar willow (*Salix exigua*) with pockets of cattails (*Typha* spp.). A larger PEM marsh occurs at the southern end of the proposed project, with the channel dominated by PSS wetland vegetation further downstream.

3.5.2.2 Impacts

Proposed Action

‘Construction’ (tree removal, and creek bank repair) at the Proposed Action site could cause minor disturbance to the nearby wetland vegetation associated with East Tollgate Creek. These wetlands are adjacent to specific tree removal sites. No fill material would be placed in or around the wetlands, and no USACE Section 404 permit would be required. In addition, no draining, dredging, channelizing, filling, diking, impounding, and related activities would occur within the wetlands. Erosion- and sediment-control BMPs required by SWPPPs (e.g., silt fences, swamp mats), as well as spill prevention, control, and countermeasure procedures identified in the Buckley AFB Integrated Environmental Response Plan, would be implemented to further reduce the potential for impacts on these wetlands. Disturbed areas would be revegetated immediately after construction is complete. There would be no net loss of wetlands and any impacts on the wetlands would be short-term, adverse and minor.

Action Alternative A

No activities would be conducted within wetland areas and no impacts on wetlands would be anticipated as a result of implementing Action Alternative A.

No Action Alternative

No impacts on wetlands would be anticipated as a result of implementing the No Action Alternative.

3.5.3 Wildlife

3.5.3.1 Affected Environment

Mammals. No ungulates occur on the installation due to the exclusion fencing around the perimeter, although pronghorn (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*) historically occurred

on the base and still inhabit surrounding properties (BAFB 2004b). Carnivores inhabiting Buckley AFB include red fox (*Vulpes vulpes*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and long-tailed weasel (*Mustela frenata*). Small mammals observed at Buckley AFB include rodents and lagomorphs (rabbits and hares). The most widely observed of the rodents is the black-tailed prairie dog (*Cynomys ludovicianus*). Prairie dogs are considered keystone species of the shortgrass prairie ecosystem as they support a diverse array of other plant and wildlife species within their colonies. Other rodents known to inhabit Buckley AFB include plains pocket gopher (*Geomys bursarius*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), fox squirrel (*Sciurus niger*), deer mouse (*Peromyscus maniculatus*), and prairie vole (*Microtus ochragaster*). Common lagomorphs include black-tailed jackrabbit (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendii*), eastern cottontail (*Sylvilagus floridanus*), and desert cottontail (*Sylvilagus auduboni*).

Birds. The midgrass prairie community supports numerous bird species, many of which are ground-nesters. The most common songbirds inhabiting prairie habitats include western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), lark bunting (*Calamospiza melanocorys*), killdeer (*Charadrius vociferous*), blackbilled magpie (*Pica hudsonia*), mourning dove (*Zenaida macroura*), western kingbird (*Tyrannus verticalis*), American robin (*Turdus migratorius*), and eastern kingbird (*Tyrannus tyrannus*). Species more common in urbanized areas include house finch (*Carpodacus mexicanus*), common grackle (*Quiscalus quiscula*), nonnative house sparrow (*Passer domesticus*), rock dove (*Columba livia*; aka pigeon), and European starling (*Sturnus vulgaris*). Raptor species known or likely to occur at Buckley AFB include burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), prairie falcon (*Falco mexicanus*), and American kestrel (*Falco sparverius*). In addition, bald eagle (*Haliaeetus leucocephalus*), ferruginous hawk (*Buteo regalis*), and rough-legged hawk (*Buteo lagopus*) can be observed in winter. Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), northern shoveler (*Anas clypeata*), great blue heron (*Ardea herodias*), and are bird species associated with the surface water resources of the base.

Reptiles and Amphibians. Plains spadefoot toad (*Spea [Scaphiopus] bombifrons*) and Great Plains toads (*Bufo cognatus*) occupy grassland habitat along riparian floodplains and can occur on Buckley AFB (Hammerson 1999). Bullfrog (*Rana catesbeiana*) and northern leopard frog (*Rana pipiens*) have been observed on the installation but are generally found near a permanent water source, which does not occur in the vicinity of either the Proposed or Alternative sites. A variety of reptile species inhabit Buckley AFB; some of the more commonly observed species include northern prairie lizard (*Sceloporus undulatus garmani*), bullsnake (*Pituophis catenifer*), western hog-nosed snake (*Heterodon nasicus*), plains garter snake (*Thamnophis radix*), and prairie rattlesnake (*Crotalus viridis*) (BAFB 2004b).

In June 2010, biological surveys were conducted at the site of potential tree removal. During these surveys, wildlife or their sign observed within and around the proposed project included black-tailed prairie dog (*Cynomys ludovicianus*), mule deer (*Odocoileus hemionus*), crayfish (species unknown), raccoon (*Procyon lotor*), coyote (*Canis latrans*), American goldfinch (*Spinus tristis*), bullock's oriole (*Icterus bullockii*), Western kingbird (*Tyrannus verticalis*), bank swallow (*Riparia riparia*), Northern flicker (*Colaptes auratus*), house finch (*Carpodacus mexicanus*), orange-crowned warbler (*Vermivora celata*), Swainson hawk (*Buteo swainsoni*), spotted towhee (*Pipilo maculatus*), red-wing blackbird (*Agelaius phoeniceus*), killdeer (*Charadrius vociferus*), meadowlark (*Sturnella neglecta*), black-billed magpie (*Pica hudsonia*), and European starling (*Sturnus vulgaris*). Five active nests were observed within trees along the creek. Numerous animal burrows of varying sizes and shapes were observed along the streambank (URS 2010).

3.5.3.2 Impacts

Proposed Action

Under the Proposed Action wildlife including tree-roosting bird populations would lose approximately 1.5 acres of shelter, nesting and foraging habitat. However, tree habitats are available south of the site, outside of the installation fenceline, and also in other areas on the installation including sites west of the project area along East Tollgate Creek. The wildlife would likely relocate to similar habitats. Impact would be adverse, short-term and moderate.

Action Alternative A

BASH activities are a deterrent, and certain species would permanently vacate the area. However, those species able to become accustomed to the pyrotechnics could remain in their current habitat. Under Alternative A there would be direct, short- and long-term, minor to moderately adverse impacts on tree-nesting bird habitat.

No Action Alternative

No impacts on wildlife or wildlife habitat are anticipated as a result of implementing the No Action Alternative.

3.5.3.3 Threatened, Endangered, and Other Sensitive Species

3.5.3.4 Affected Environment

Threatened and endangered plant and animal species are protected under the ESA or Colorado state law. An endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range; a threatened species is one that is likely to become endangered in the foreseeable future. Other sensitive species include those listed by the Colorado Division of Wildlife (CDOW) as species of special concern. Special concern species receive no formal protection, but are still considered when assessing potential project impacts.

Federal- and Colorado state-listed threatened and endangered species, as well as CDOW species of concern, with the potential to occur or be affected by projects in Arapahoe County, Colorado are shown in Table 3-1. A number of species that lack suitable habitat, are unlikely to occur, or would not be impacted are not discussed further. These species include the Preble's meadow jumping mouse, bald eagle, whooping crane, least tern, Mexican spotted owl, piping plover, northern leopard frog, pallid sturgeon, Utes ladies'-tresses, and Western prairie fringed orchid.

Table 3-1. Threatened and Endangered Species and Species of Special Concern

Common Name	Scientific Name	Status		Potential for Occurrence on Site
		Federal	State	
Mammals				
Preble’s meadow jumping mouse	<i>Zapus hudsonius preblei</i>	T	ST	Not present; Buckley AFB is within Denver Metropolitan Area Block Clearance Zone.
Birds				

Table 3-1. Threatened and Endangered Species and Species of Special Concern

Common Name	Scientific Name	Status		Potential for Occurrence on Site
		Federal	State	
Burrowing owl	<i>Athene cunicularia</i>	MBTA BCC	ST	Low. Habitat exists within the project area. The species has been observed in the general area but none in the immediate propose tree removal area.
Ferruginous hawk	<i>Buteo regalis</i>	MBTA	SC	Low. The species may use the area for foraging.
Piping plover ▲	<i>Charadrius melodus</i>	T, MBTA	ST	Low
Whooping crane ▲	<i>Grus americana</i>	E, MBTA	--	Low
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA, MBTA	SC	Suitable habitat exists. Individuals have been recorded in the area.
Least tern (interior population) ▲	<i>Sternula antillarum</i>	E, MBTA	SE	Low
Mexican spotted owl	<i>Strix occidentalis lucida</i>	T, MBTA	ST	Low
Lesser Prairie-Chicken	<i>Tympanuchus pallidicinctus</i>	BCC ESA Candidate	--	Low
Golden Eagle	<i>Aquila chrysaetos</i>	BCC	--	Low. Suitable habitat exists. Individuals have been recorded in the area.
Prairie Falcon	<i>Falco mexicanus</i>	BCC	--	Suitable habitat exists. Individuals have been recorded in the area.
Snowy Plover	<i>Charadrius alexandrinus</i>	BCC	--	Low
Mountain Plover	<i>Charadrius montanus</i>	BCC	--	Low
Upland Sandpiper	<i>Bartramia longicauda</i>	BCC	--	Low
Long-billed Curlew	<i>Numenius americanus</i>	BCC	--	Low
Lewis' Woodpecker	<i>Melanerpes lewis</i>	BCC	--	Habitat exists
Willow Flycatcher	<i>Empidonax traillii</i>	BCC	--	Habitat exists
Bell's Vireo	<i>Vireo bellii</i>	BCC	--	Habitat exists
Sprague's Pipit	<i>Anthus spragueii</i>	BCC	--	Non-breeding, Habitat exists
McCown's Longspur	<i>Calamospiza melanocorys</i>	BCC	--	Habitat exists
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	BCC	--	Habitat exists
Amphibians and Reptiles				
Northern leopard frog	<i>Rana pipiens</i>	--	SC	Little suitable habitat exists. No individuals were observed in the project area.
Common garter snake	<i>Thamnophis sirtalis</i>	--	SC	Habitat exists within the project area. No individuals were observed in the project area.

Table 3-1. Threatened and Endangered Species and Species of Special Concern

Common Name	Scientific Name	Status		Potential for Occurrence on Site
		Federal	State	
Fish				
Pallid sturgeon ▲	<i>Scaphirhynchus albus</i>	E	--	Low
Plants				
Western prairie fringed orchid ▲	<i>Platanthera praeclara</i>	T	--	Low
Ute ladie’s-tresses orchid	<i>Spiranthes diluvialis</i>	T	--	Unlikely; survey conducted in 2001 found no occurrences.

Source: URS 2010

▲ Water depletions in the South Platte River may affect the species and/or critical habitat in downstream reaches in other states.

No water depletions would be associated with this project.

BCC = USFWS Birds of Conservation Concern for Region 6 (Mountain-Prairie Region)

BGEPA = Bald and Golden Eagle Protection Act (1940)

E = Endangered

MBTA = Migratory Bird Treaty Act (1918)

SC = Species of Special Concern in Colorado (CDOW listing, not a statutory category)

SE = State Endangered

ST = State Threatened

T = Threatened

Low = Suitable habitat does not exist in the project area, and the species are not likely to occur in the area

Burrowing Owl. Burrowing owls are listed as threatened in Colorado but also receive Federal protection under the MBTA. Burrowing owls nest in abandoned prairie dog burrows and are generally present on installation from early March to late October. Burrowing owls have the potential to occur near the East Tollgate Creek area due to the prairie dog activity in that area of the installation.

Common Garter Snake. In Colorado, the Common garter snake is listed as a Species of Concern. The common garter snake inhabits marshes, ponds, and the edges of streams. For the most part, it is restricted to aquatic, wetland, and riparian habitats along the floodplains of streams.

3.5.3.5 Impacts

This section analyzes potential impacts on burrowing owls (Colorado Threatened) and common garter snakes (Colorado Species of Special Concern) from implementation of the Proposed Action and Action Alternatives.

No federally listed species would incur impacts from the tree removal and creek bank repair actions of the proposed project or from BASH pyrotechnic measures of the alternative.

Proposed Action

Burrowing Owls. Burrowing owls have nested in various locations throughout Buckley AFB where suitable prairie dog habitat occurs. The Proposed Action would not impact the nearby prairie dog colony. Any loss of prairie dog burrows in conjunction with the Proposed Action would reduce the availability of potential burrowing owl nest sites; however, this loss is expected to be non-existent or negligible and nest sites would still be available in other areas of Buckley AFB.

Burrowing owls might be present during the breeding season (between March 1 and October 31) at the Proposed Action site. Burrowing owls would not be present outside of the breeding season and have not been identified by 460 SW or USDA or as a flight safety risk within this area. Should activities occur during the burrowing owl nesting season, pre-construction surveys would be conducted to determine the presence or absence of nesting burrowing owls at the proposed site, in accordance with the *Supplement to Environmental Assessment of Proposed Prairie Dog Practices at Buckley Air Force Base* (BAFB 2001). If nesting burrowing owls are present, a 150-foot (45.72-meter) buffer would be established around active nest sites during the breeding season to protect owls from disturbances associated with construction, especially increased noise. Given these measures, direct and short-term impacts on nesting individuals or young burrowing owls from construction-related activities would be negligible.

Common Garter Snakes. The Proposed Action would have adverse, short-term, negligible impacts to the snake by temporarily disrupting habitat and prey availability as a result of vehicle traffic.

Action Alternative A

Nesting Burrowing owls would be subjected to the noise-generating BASH pyrotechnics. A 150-foot (45.72-meter) buffer would be established around active nest sites during the breeding season to protect owls from disturbances associated with noise. Individuals could become accustomed to the pyrotechnics and would remain in their established location during the nesting season. Burrowing owls would be discouraged by pyrotechnics from nesting in the area in subsequent seasons. Under Action Alternative A pyrotechnics would have direct, short-term, negligible adverse impacts on Burrowing owls.

No impacts on the common garter snake are expected under the Action Alternative A.

No Action Alternative

No impacts on threatened, endangered, or other sensitive species are expected under the No Action Alternative, as no trees would be removed and no new BASH measures would be implemented.

3.6 SUMMARY

Table 3-2 provides a summary comparison of the anticipated environmental effects of the Proposed Action, Action Alternatives, and the No Action Alternative.

Table 3-2. Comparison of Environmental Effects

Environmental Resource Area	Proposed Action	Alternative A	No Action Alternative
MMRP	Adverse, short-term, and insignificant.	Adverse, short-term, and insignificant.	No effect
Safety	<p>Mission</p> <p>Beneficial impacts would enhance flight safety compared to the baseline conditions.</p> <p>Landscaping/Construction</p> <p>Adverse impacts to personnel safety (tree cutting) would be short-term, and insignificant.</p>	<p>Mission</p> <p>Beneficial while harassment is on-going.</p> <p>Implementation</p> <p>Adverse impacts would be short-term, and insignificant.</p>	<p>Mission</p> <p>Birds would continue to be attracted to the area and pose safety risks for the flight mission.</p>
Soils	Adverse, short-term, and insignificant.	No effect	No effect

Water Resources	<p>Minor, long-term, beneficial impacts on groundwater.</p> <p>Adverse, short-term and insignificant on surface water.</p> <p>No impact on stormwater.</p> <p>Negligible, short-term, and insignificant impacts, no permanent effects on floodplains.</p>	No effect	No effect
Biological Resources			
Vegetation	Adverse, long-term and insignificant.	No effect	No effect
Wetlands	Short-term, adverse and insignificant.	No effect	No effect
Wildlife	Adverse, short-term, and insignificant.	Adverse short- and long-term, insignificant	No effect
Threatened, Endangered, and Special Concern Species	<p>Adverse, short-term, and insignificant (Burrowing owl).</p> <p>Adverse, short-term, and insignificant (Common garter snake).</p>	<p>Short-term, adverse, and insignificant.</p> <p>(Burrowing owl)</p> <p>No effect (Common garter snake).</p>	No effect

Table 3-3 provides a summary of the BMPs or the plans providing BMPs identified in this EA for each resource topic.

Table 3-3. BMPs or Plans Providing Applicable BMPs

Environmental Resource Area	BMPs or Plans Providing Applicable BMPs		
	Proposed Action	Alternative A	No Action
MMRP	Hazardous Waste Management Plan; Solid Waste Management Plan; Spill Prevention, Control and Countermeasure Plan	None	None
Safety	Contractor-established and -maintained safety programs per OSHA	None	None
Soils	Standard soil erosion and sediment retention BMPs	None	None
Water Resources	CGP, SWPPP, SWMP, USAF ETL 03-01	None	None
Biological Resources			
Vegetation	Post-construction revegetation with native species	None	None
Wetlands	Soil erosion, sediment retention, and stormwater runoff BMPs	None	None
Wildlife	None	None	None
Threatened, Endangered, and Special Concern Species	Establishment of 150-foot buffer around burrowing owl nests	Establishment of 150-foot buffer around burrowing owl nests	None

Table 3-4 summarizes required mitigation measures identified for each resource in this EA.

Table 3-4. Required Mitigation Measures

Environmental Resource Area	Mitigation		
	Proposed	Alternative A	No Action
MMRP	None	None	None
Safety	None	None	None
Soils	None	None	None
Water Resources	None	None	None
Biological Resources			
Vegetation	None	None	None
Wetlands	None	None	None
Wildlife	None	None	None
Threatened, Endangered, and Special Concern Species	None	None	None

3.6.1 Conclusion

The current presence of trees along East Tollgate Creek to the west of the Buckley AFB flightline poses a threat to the safety of the flying mission from a BASH perspective. The proposed action would reduce that flight safety risk by removing the known proximal hazard posed by the trees that provide roosting and perching habitat for raptors and habitat for other smaller bird species. The safety benefits associated with the tree removal would be realized 365 days a year as the species, particularly large raptors that are known to frequent this area, have been observed year round.

The proposed project area is located within ERP Site MB103, which has not been fully cleared of MD. Since activities would not be conducted at the site until clearance is granted from 460 SW/SE OPR, impacts associated with tree removal activities would be negligible from a personnel safety standpoint.

Action Alternative A would contribute to the safety of the flying mission, but without the adverse effects on vegetation. Actions in this alternative would require an ongoing personnel commitment in the area in order to provide a benefit beyond temporary. Since activities would not be conducted at the proposed tree removal site until clearance is granted from 460 SW/SE OPR, impacts associated with personnel in the area would be negligible from a personnel safety standpoint and overall flight safety would be increased once the area is cleared for personnel to operate.

Under the No Action Alternative, potential safety impacts for the 140 WG flying mission would continue.

3.6.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action.

Soil Resources. Under the Proposed Action, tree removal and construction activities, such as grading and recontouring of the soil, would result in soil disturbance. Implementation of BMPs during tree removal activities would limit the potential effects resulting from these activities. Standard erosion-control means would also reduce potential impacts related to these characteristics. Unavoidable impacts on soils at the installation would be minor in both the short-term and long-term.

Biological Resources. The Proposed Action would result in vegetation (tree) removal and subsequent habitat loss for wildlife.

3.6.3 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Buckley AFB. Tree removal and East Tollgate Creek bank repair actions would not result in any incompatible land uses on or off installation. The proposed location is currently undeveloped land and would remain so. Consequently, removing the trees and stabilizing the creek would not conflict with installation land use policies or objectives. The Proposed Action would not conflict with any applicable off-installation land use ordinances or designated clear zones.

3.6.4 Relationship Between the Short-term Use of the Environment and Long-term Productivity

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 2 years. Long-term uses of the human environment include those impacts that occur over a period of more than 2 years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in any intensification of land use at Buckley AFB and in the surrounding area. The Proposed Action does not represent any loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts. Long-term productivity of this site would not change by the implementation of the Proposed Action.

3.6.5 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material, energy, land, biological, and human resources. The use of these resources is considered to be permanent. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the Proposed Action.

Energy Resources. Energy resources utilized for the Proposed Action would be irreversibly lost. These include petroleum-based products (such as gasoline and diesel). During tree removal and creek bank repair actions, gasoline and diesel would be used for the operation of saws and vehicles. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Biological Resources. The Proposed Action would result in irretrievable loss of vegetation and wildlife habitat on East Tollgate Creek.

Human Resources. The use of human resources for tree removal and creek bank repair is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

4. CUMULATIVE IMPACTS

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

4.1 IMPACT ANALYSIS

Other projects evaluated in the cumulative impacts analysis include planned or reasonably foreseeable projects both on-installation and off-installation. Planned or reasonably foreseeable projects were identified through a review of public documents and coordination with multiple agencies, and include both on- and off-installation activities.

Off-Installation Activities. Planned land use for the entire area abutting the eastern boundary of Buckley AFB is to incorporate the Buckley Research and Development theme. Small-scale office development is allowed to complement the Research and Development land use, and limited industrial and commercial services are permitted. Regionally, a residential development comprising 435 acres is currently under construction within 0.5 mile of the southern limits of Buckley AFB. Just east of this development, a 490-acre residential development has been constructed (Aurora 2003).

On-Installation Activities. There are a number of recent, current, and planned Capital Improvement Projects to support Buckley AFB's continuing transition from an ANGB to an AFB and to facilitate future growth. There were 75 construction projects either recently completed, currently under construction or planned for the near future, in addition to seven demolition projects planned for the near future. Within these construction projects, there are plans to repair the South Runway, upgrade taxiways Juliet and Lima and extend the North Runway.

As presented in Table 4-1, cumulative impacts of the Proposed Action on resources within the ROI include short- and long-term, adverse impacts that range from negligible to major in intensity. The primary reasons for the major adverse impacts of the Proposed Action are the risks of injury or loss of life from MD and UXO in MRS MB103.

Table 4-1. Cumulative Effects on Resources

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
ERP	Buckley Field was first used by the military for training during World War II.	ERP site at the Proposed Action is currently undergoing full delineation.	Proposed Action would be implemented in ERP Site MB103 under the guidance of DDESB.	ERP MMRP sites would be remediated.	Localized effects of the Proposed Action would contribute negligibly to cumulative impacts.
Safety	Colorado Air National Guard (COANG) acquired use of Buckley Field in 1946.	The 140 th Wing (140 WG) of the COANG operates and manages the only active military airfield in the Denver metropolitan area.	Proposed Action would remove habitat attractant for birds near the airfield year-round. Some birds would still forage in the area. Some open water habitat would increase in ponded areas and during a wet season.	ERP MMRP sites will be remediated Flight mission would continue to grow.	Long-term incremental beneficial cumulative effects from reduction of BASH attractants near the airfield by removing a proximal habitat for raptors in the area.
Soil Resources	Past urban and Buckley AFB development has modified soils.	Current development activities continue to alter soils.	Recontouring would result in further soil disturbance.	Continued development on Buckley AFB would locally impact soils.	Permanent but localized effects of the Proposed Action would contribute only negligibly to cumulative impacts.
Water Resources	Past urban and Buckley AFB development has increased impermeable surfaces and increased demands on groundwater.	Surface water quality moderately impacted by storm water runoff from the urban developments. Ground water resources are limited.	Proposed Action would reduce draw on groundwater from tree removal. There would be no change in permeable surface area.	Continued development of Buckley AFB would result in sedimentation from construction activities, and further increase in impervious surface area.	Beneficial cumulative impacts on groundwater would be negligible.
Biological Resources	In October 2000, Buckley Air National Guard Base (ANGB) was realigned and became an AFB under the 821st Space Group. City of Aurora developed around AFB.	Buckley AFB and Aurora operations and development reduce wildlife habitat. Wildlife depredation and harassment conducted on the airfield to reduce BASH hazards.	Disturbance of vegetation from tree removal. Loss of tree-roosting bird habitat.	Continued development of Buckley AFB would further reduce wildlife habitat. There are proposed actions to remove prairie dog colonies on the installation. Removal of prairie dog colonies would also reduce burrowing owl habitat.	Permanent, loss of vegetation and bird habitat from the Proposed Action would incrementally add to the overall moderate impacts from on-base and off-base development.

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PO Box 159
Crow Agency, MT 59022

Mr. Raymond J. Redwing
Tribal Historic Preservation Officer
Flandreau Santee Sioux Tribe
PO Box 283
Flandreau, SD 57028

Mr. Vernon Hill
Cultural Coordinator
Eastern Shoshone Preservation Office
Eastern Shoshone Tribe of Wind
River Indian Reservation
PO Box 538
Fort Washakie, WY 82514

Mr. Curley Youpee
Director, Cultural Resources
Department
Fort Peck Tribes of Assiniboine and
Sioux
PO Box 1027
Poplar, MT 59255

Mr. Michael Darrow
Fort Sill Apache Tribe of Oklahoma
Rt.2, Box 121
Apache, OK 73507

Mr. Jeff Blythe
Tribal Historic Preservation Officer
Jicarilla Apache Nation
PO BOX 1367
Dulce, NM 87528

Ms. Jamē Lyn Eskew
Kiowa Culture Preservation
Authority
Kiowa Tribe of Oklahoma
PO Box 885
Carnegie, OK 73015

Mr. Linwood Tallbull
Tribal Historic Preservation Officer
and Cultural Representative
Northern Cheyenne Tribe of the
Northern Cheyenne Reservation
PO Box 128
Lame Deer, MT 5904

Ms. Holly Houghton
Tribal Historic Preservation Officer
and NAGPRA Contact
Mescalero Apache Tribe
PO BOX 227
Mescalero, NM 88340

Ms. Clair Green
Cultural Representative
Lower Brule Sioux Tribe
187 Oyate Circle
Lower Brule, SD 57548

Ms. Betsy Chapoose
Director of Cultural Rights and
Protection
Northern Ute Indian Tribe of the
Uintah and Ouray Ute Reservation
PO Box 190
Duchesne, UT 84026

Mr. Michael Catches Enemy
Oglala Sioux Tribe
Natural Resources Officer
PO Box 320
Pine Ridge, SD 57770

Francis Morris
Repatriation Coordinator
Repatriation and the Tribal
Preservation Office
Pawnee Nation of Oklahoma
881 Little Dee Drive
Pawnee, OK 74058

Mr. Russell Eagle Bear
Tribal Historic Preservation Officer
Rosebud Sioux Tribe
PO Box 809
Rosebud, SD 57570

Mr. Frankie Jackson
Tribal Historic Preservation Officer
Council Headquarters/Museum
Santee Sioux Nation
108 Spirit Lake Avenue West
Niobrara, NE 68760

Mr. Neil Cloud
NAGPRA Coordinator
Southern Ute Tribal Council
PO BOX 737
Ignacio, CO 81137

Ms. Waste'win Young
Tribal Historic Preservation Officer
Standing Rock Sioux Tribe
PO Box D
Fort Yates, ND 58538

Mr. Perry Brady
Tribal Historic Preservation Officer
Mandan, Hidatsa, Arikara
Three Affiliated Tribes
404 Frontage Road
New Town, ND 58763

Mr. Terry Knight
Tribal Historic Preservation Officer
Ute Mountain Ute Tribe
125 Mike Wash Road
PO Box JJ
Towaoc, CO 81334

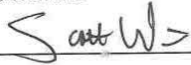
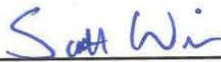
Mr. Stratford Williams
Wichita and Affiliated Tribes
PO Box 729
Anadarko, OK 73005

Ms. Lana Gravatt
Tribal Historic Preservation Officer
Yankton Sioux Tribe
PO Box 248
Marty, SD 57361

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APPENDIX A

AIR FORCE FORM (AF) 813, REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS		Report Control Symbol RCS: 48865
INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).		
SECTION I - PROPONENT INFORMATION		
1. TO (Environmental Planning Function) 460 CES/CEVP	2. FROM (Proponent organization and functional address symbol) 460 CES/CEV and 460 CES/CEO	2a. TELEPHONE NO. 847-9218
3. TITLE OF PROPOSED ACTION Tree Removal, South East-Toll Gate Creek		
4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) To reduce potential bird air strike hazards (BASH) to flight operations by removing potential roosting/perching habitat for birds in the area. Need by 15 Apr 10. WR# 48865		
5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.) Remove cottonwood trees near active runway (see map).		
6. PROPONENT APPROVAL (Name and Grade) Laurie Fisher, YF-02 Scott Wilson, RD-02	6a. SIGNATURE 	6b. DATE 20100325
SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)		
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. WATER RESOURCES (Quality, quantity, source, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, threatened or endangered species, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16. OTHER (Potential impacts not addressed above.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION		
17. <input type="checkbox"/> PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) #A2.3.6 ; OR A2.3.10, A2.3.11 <input checked="" type="checkbox"/> PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.		
18. REMARKS Ref: Supplemental EA for Proposed Prairie Dog Management Practices. FONSI 6-25-01 This action does not qualify for a categorical exclusion. An environmental assessment must be developed to determine environmental impacts.		
19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade) Scott Wilson, RD-02	19a. SIGNATURE 	19b. DATE 26 April 10

APPENDIX B NOTICE OF AVAILABILITY OF PUBLICATION

AURORA SENTINEL/ BUCKLEY GUARDIAN PROOF OF PUBLICATION

STATE OF COLORADO
COUNTY OF ARAPAHOE }ss.

I HARRISON COCHRAN, do solemnly swear that I am the PUBLISHER of the AURORA SENTINEL; that the same is a weekly newspaper published in the County of Arapahoe, State of Colorado and has a general circulation therein; that said newspaper has been published continuously and uninterruptedly in said County of Arapahoe for a period of more than fifty-two consecutive weeks prior to the first publication of the annexed legal notice or advertisement; that said newspaper has been admitted to the United States mails as second-class matter under the provisions of the Act of March 30, 1923, entitled "Legal Notices and Advertisements", or any amendments thereof, and that said newspaper is a weekly newspaper duly qualified for publishing legal notices and advertisements within the meaning of the laws of the State of Colorado.

That the annexed legal notice or advertisement was published in the regular and entire issue of every number of said weekly newspaper for the period of 4 consecutive insertions; and that the first publication of said notice was in the issue of Thursday Daily dated December 2 A.D. 2010 and Thursday Home Edition dated December 2, 2010 and Weekend Edition dated December 3-5, 2010 and Buckley Guardian dated December 3 A.D. 2010.

In witness whereof I have hereunto set my hand this 3 day of December.

H. Harrison Cochran

Subscribed and sworn to before me, a notary public in the County of Arapahoe, State of Colorado, this 3 day of December A.D. 2010.



Janie C. Hilton
Notary Public

My Commission expires December 15, 2012

APPENDIX C AIR CONFORMITY ANALYSIS

The CAA requires that USEPA promulgate general conformity regulations. These regulations are designed to ensure that Federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and the promulgated regulations, found in 40 CFR Part 93, exempt certain Federal actions from conformity determinations (e.g., contaminated site cleanup and natural emergency response activities). A conformity analysis must be performed prior to commencement of a Federal action that generates air pollutants in a region that has been designated as “nonattainment” or “maintenance” for one or more of the NAAQS. The USEPA has assigned the Denver metropolitan area, including Buckley AFB as in attainment/maintenance for particulate matter and carbon monoxide, and nonattainment for ozone. General Conformity under the CAA, Section 176 has been evaluated for the Proposed Action according to the requirements of 40 CFR 93, Subpart B. The maximum annual total direct and indirect emissions of this action have been estimated according to the Buckley AFB General Conformity Management Strategy and the requirements of 40 CFR 93, Subpart B. Emissions from this action are listed in the following table. These levels are below the 100 tpy conformity threshold value established by 40 CFR 93.153(b) for the Denver Air Quality Control Region maintenance area.

EMISSIONS FROM PROPOSED ACTION (Table 1-2)

Maintenance Area	Pollutant	Applicable Conformity Threshold Values (tons per year – tpy)	Regionally Significant Emission Levels (tpy)	Maximum Annual Emissions from “large” Proposed Action (tpy) ¹
Ozone	NO _x or NO ₂	100	11,278	Less than 10
	VOC	100	16,790	Less than 4
PM ₁₀	PM ₁₀	100	3,215	Less than 14
CO	CO	100	67,817	Less than 33