Draft

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR IMPLEMENTATION OF BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD MANAGEMENT PROCEDURES

MARCH 2023

PRIVACY ADVISORY NOTICE

This Draft Programmatic Environmental Assessment is provided for public comment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and the Department of the Air Force *Environmental Impact Analysis Process*. The *Environmental Impact Analysis Process* provides an opportunity for the public to provide input on the proposed action and alternatives and solicits comments on the Department of the Air Force's analysis of potential environmental effects.

Providing personal information during public commenting is voluntary. Any personal information provided will only be used to fulfill requests for copies of the Final PEA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final PEA; however, only the names of the individuals making comments will be disclosed. Personal home addresses and phone numbers will not be published.

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ABSTRACT

Designation:	Programmatic Environmental Assessment
Title of Proposed Action:	Implementation of BASH Management Procedures
Project Location:	Department of the Air Force Installations
Lead Agency:	Department of the Air Force
Cooperating Agency:	U.S. Department of Agriculture-Wildlife Services
Affected Region:	Continental United States (U.S.) (CONUS)
Action Proponent:	Air Force Civil Engineering Center (AFCEC)
Point of Contact:	Helen Kellogg AFCEC/CZN 2261 Hughes Avenue, Suite 155 JBSA Lackland, TX 78236-9853 helen.kellogg.1@us.af.mil
Date:	**March 2023**

The Department of the Air Force (DAF) has prepared this Programmatic Environmental Assessment (PEA) in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and DAF regulations for implementing the National Environmental Policy Act. The Proposed Action would implement an adaptive approach to wildlife hazard management utilizing short-, medium-, and long-term management strategies and non-lethal and lethal techniques, as deemed appropriate within the wildlife exclusion zone on DAF installations within the CONUS. These strategies comply with all applicable federal regulations, state regulations, and permitting requirements. The Proposed Action, in accordance with DAF Instruction 91-212, *Bird/wildlife Aircraft Strike Hazard (BASH) Management Program*, outlines an approach to BASH management that supports unique DAF airfield operational and security requirements as well as airfield operation safety in general. Implementation of the approved management procedures and techniques would ensure an adaptive management approach to BASH is optimized for consistency with scientifically evidenced best management practices as detailed in wildlife damage management guidance, manuals, and literature.

This PEA for implementation of BASH management procedures evaluates the potential environmental impacts associated with the Proposed Action and the No Action Alternative to the following resource areas: airfield operations and management, biological resources, water resources, cultural resources, hazardous materials and wastes, human health and safety, air quality, noise, and land use.

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PROPOSED
FINDING OF NO SIGNIFICANT IMPACT
IMPLEMENTATION OF BASH MANAGEMENT PROCEDURES AT
DEPARTMENT OF THE AIR FORCE INSTALLATIONS
IN THE CONTINENTAL UNITED STATES

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code 4321-4370h; Council on Environmental Quality Regulations, 40 Code of Federal Regulations (CFR) 1500-1508 (2022); and the U.S. Department of the Air Force (DAF) Environmental Impact Analysis Processes (EIAP), 32 CFR 989, the DAF prepared the attached Programmatic Environmental Assessment (PEA) to assess the potential environmental consequences associated with the Proposed Action to implement Bird/wildlife Strike Hazard (BASH) management procedures at DAF installations within the continental United States (CONUS).

Purpose and Need

The purpose of the Proposed Action is to support airfield operational safety through implementation of wildlife hazard management strategies and best management practices (BMPs). The need for the Proposed Action is to ensure BMPs and wildlife hazard management strategies that reduce the attractiveness of airfield environs to wildlife at DAF installations nationwide, comply with all applicable federal regulations, state regulations, and permitting requirements, and adhere to DAF natural resources conservation programs.

Description of Proposed Action and Alternatives

The DAF proposes to implement an adaptive approach to BASH management at CONUS DAF installations as the service continues to modernize training and air power tactics into the future. The BASH management strategies would be used as deemed appropriate to optimize the management of wildlife hazards within the wildlife exclusion zone on all CONUS DAF installations consistent with DAF Instruction 91-212, *Bird/wildlife Aircraft Strike Hazard (BASH) Management Program.* As this is a programmatic action, if consultation with federal and/or state resource agencies for implementation of BASH management procedures will be required, the consultation will occur at the installation-level.

Proposed Action

The Proposed Action includes a suite of short-, medium-, and long-term strategies and non-lethal and lethal measures. The methods are divided into two categories: passive management and active controls. The strategies include a selection of habitat modification/management, harassment, entrapment/relocation, and depredation. The methods chosen by DAF installations will depend largely on the installation's situation and the species involved. The Proposed Action is described in detail in **Section 2.3.1** of the PEA.

No Action Alternative

The No Action Alternative in the PEA (**Section 2.3.2**) provides a baseline against which to contrast the impacts of the Proposed Action and can be evaluated to identify impacts to the human environment in the absence of the Proposed Action.

Summary of Findings

The PEA evaluates the potential environmental consequences of implementing the Proposed Action with regard to airfield operations and management, biological resources, water resources, cultural resources, hazardous materials and wastes, human health and safety, air quality, noise, and land use. The DAF has concluded that the Proposed Action will not meaningfully or measurably affect environmental justice, socioeconomics, earth resources, or infrastructure and utilities; thus, these resources have been eliminated

from detailed analysis in the PEA. The analyses of the potential environmental consequences associated with implementing the Proposed Action and the No Action Alternative are presented in **Section 3.0** of the PEA. No significant environmental impacts or programmatic mitigation measures associated with implementation of the Proposed Action were identified.

This PEA evaluates wildlife management procedures that may be employed at installations. In most cases, a follow-on analysis or supplement that considers local conditions will be required before the management procedures can be implemented at a particular installation. To meet NEPA requirements for site-specific BASH management, each installation will review existing NEPA documentation, including this PEA, to determine the extent to which NEPA requirements are met. A tiered NEPA analysis can be used when there is the potential for site-specific impacts to occur at a greater level of significance than what has been assessed in this PEA. Any required mitigation measures will be identified at a site-specific level and documented.

Each DAF installation must, per Section 106 of the National Historic Preservation Act (NHPA), as amended, and as implemented by 36 CFR 800.3(a), initiate consultation with the State Historic Preservation Office (SHPO) and federally recognized tribes affiliated with their installation when a proposed BASH management strategy has the potential to adversely affect historic properties. Habitat modification, building modifications, and ground disturbing activities have the potential to adversely affect historic properties. Consultation is not required for harassment and depredation that does not have the potential to adversely affect historic properties. Completion of NHPA consultation will be documented in the site-specific NEPA analysis. Therefore, implementation of the BASH management procedures described in the PEA and analyzed in subsequent site-specific analyses are not anticipated to significantly impact cultural resources.

The DAF coordinated with the U.S. Fish and Wildlife Service (USFWS) as a participating agency as described in **Section 1.7** of the PEA. Each installation will be required to consult with the appropriate state USFWS office in accordance with the Endangered Species Act (ESA) Section 7, as applicable. Instances where Section 7 consultation may be required are identified in **Tables 2.5.1** and **2.5.2** of the PEA. If BASH management strategies as part of the Proposed Action are planned and implemented as described in the PEA, biological resources would likely not be significantly impacted.

Regulatory Compliance

Installations will comply with DAF and Department of Defense directives and instructions, all applicable federal laws (e.g., ESA, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, Clean Water Act, and National Historic Preservation Act) and state laws and regulations, including consultation and permitting requirements. Therefore, implementing BASH management procedures under the Proposed Action will be anticipated to have no significant impacts.

Cumulative Effects

The qualitative analysis in **Section 3.0** of the PEA indicates no significant impact to any resource area. The geographic and temporal boundaries for analysis of cumulative effects will be installation-specific. Should installations need to conduct additional NEPA analysis for implementation of BASH management procedures presented in this PEA, the installations will consider only those resources that have the potential to be affected from the incremental effects of proposed BASH management procedures in combination with past, present, and reasonably foreseeable future activities relative to their location and include cumulative analysis in tiered NEPA, as applicable.

Public Involvement

The DAF published a Notice of Availability of the Draft PEA for *Implementation of Bird/wildlife Strike Hazard Management Procedures* and proposed Finding of No Significant Impact (FONSI) in the USA Today newspaper. The notice ran for two consecutive days and indicated the availability of the Draft PEA and proposed FONSI for a 45-day review and comment period. The Draft PEA and proposed FONSI are available online at https://www.afcec.af.mil/Home/Environment/National-Environmental-Policy-Act-Center/.

Finding of No Significant Impact

After review of the PEA for Implementation of BASH Management Procedures, and which is hereby incorporated by reference, I have determined that the Proposed Action will not have a significant impact on the quality of the human or natural environment with implementation of the identified regulatory compliance measures. Accordingly, an Environmental Impact Statement is not required. The signing of this FONSI completes the environmental impact analysis process.

SIGNATORY **Date**

Attachment:
Programmatic Environmental Assessment for Implementation of Bird/wildlife Strike Hazard Management Procedures

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PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR IMPLEMENTATION OF BASH MANAGEMENT PROCEDURES

TABLE OF CONTENTS

List of Figures

List of Tables

ACRONYMS AND ABBREVIATIONS

AFCEC	Air Force Civil Engineering Center
AFMAN	Air Force Manual
AFSEC	Air Force Safety Center
AFSEC/SEFW	BASH Team
AICUZ	Air Installations Compatible Use Zones
ATV	all-terrain vehicle
BASH	Bird/wildlife Aircraft Strike Hazard
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CONUS	Continental U.S.
CWA	Clean Water Act
DAF	Department of the Air Force
DAFI	DAF Instruction
dB	decibel
dBA	A-weighted decibel
DoD	Department of Defense
DoDI	Department of Defense Instruction
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
INRMP	Integrated Natural Resources Management Plan
JLUS	Joint Land Use Study
Lead	Pb
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NHPA	National Historic Preservation Act
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
NRHP	National Register of Historic Places
O_3	Ozone
OSHA	Occupational Health and Safety Administration
PEA	Programmatic Environmental Assessment
PFAS	per- and polyfluoroalkyl substances
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
PPE	personal protective equipment
REPI	Readiness and Environmental Protection Integration
SEFW	Aviation Safety Division
SHPO	State Historic Preservation Office
SOPs	Standard Operating Procedures
SO_2	Sulfur Dioxide
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the U.S.
WS	Wildlife Services

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1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The United States (U.S.) Department of the Air Force (DAF) proposes to optimize Bird/wildlife Aircraft Strike Hazard (BASH) management strategies outlined in the DAF Guidance for BASH Management, DAF Instruction (DAFI) 91-212, *Bird/wildlife Aircraft Strike Hazard (BASH) Management Program* (DAF 2021a) at all DAF installations with a flying mission (including Air Force-owned auxiliary airfields and ranges) located in the continental U.S. (CONUS) as the DAF continues to modernize training and air power tactics into the future. **Figure 1.1-1** illustrates the location of CONUS DAF installations.

This Programmatic Environmental Assessment (PEA) is being prepared to evaluate the potential environmental impacts of the proposed action in compliance with the National Environmental Policy Act of 1969 [(NEPA), (42 U.S. Code [USC] 4331 *et seq*.), the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] 1500–1508), as amended, and the DAF *Environmental Impact Analysis Process* (EIAP) promulgated at 32 CFR 989. This PEA will evaluate a suite of BASH management procedures at CONUS DAF installations and support decision-making for implementation at the site-specific level.

The DAF BASH management program developed DAFI 91-212 in adherence to the Sikes Act, *Conservation Programs On Military Installations*, Section 101. DAFI 91-212 incorporates by reference U.S. Department of Agriculture (USDA) - Wildlife Services (WS) guidance for wildlife hazard management, Department of Defense (DoD) Instruction (DoDI) 4715.03, *Natural Resources Conservation Program* (DoD 2018a); and Air Force Manual (AFMAN) 32-7003, *Environmental Conservation* (DAF 2020a) to provide implementing guidance for the management of airfield environments.

DAF installations are responsible for development and implementation of BASH plans to ensure mission capability through the reduction of wildlife hazards to aircraft operations. BASH management plans must be consistent and mutually supported by Integrated Natural Resources Management Plans (INRMPs), which are required for all installations with significant natural resources (DAF 2020a) to ensure compliance with the Sikes Act. **Appendix A** provides the list of CONUS DAF installations that meet the requirement to prepare an INRMP. A few DAF installations have a significant flying mission but lack the natural resources required to prepare an INRMP; however, these installations are still required to develop and implement BASH plans.

Ensuring implementation of best management practices (BMPs) for habitat management and wildlife hazard management measures would continue to provide the safest flying environment possible.

1.2 BACKGROUND

BASH constitutes a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. The concern is not limited to birds. Other wildlife, such as deer, coyote, and rabbit also represent potential strike hazards.

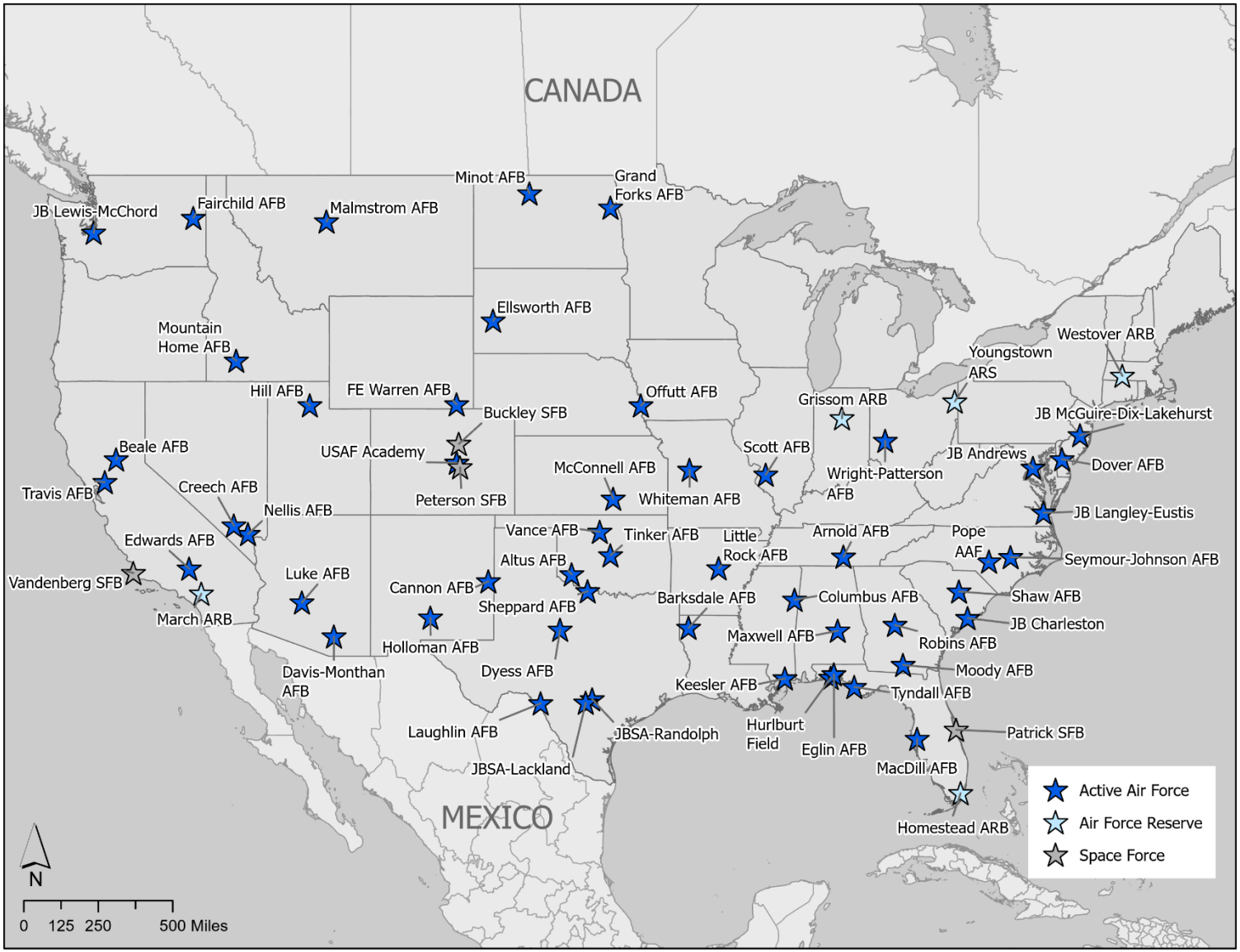

Figure 1.1-1. CONUS DAF Installations with a Flying Mission

In 2002/2003, the Federal Aviation Administration (FAA), U.S. Air Force, USDA-WS, U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), and Environmental Protection Agency (EPA) signed a Memorandum of Agreement to acknowledge their respective missions in protecting aviation from wildlife hazards (FAA 2003).

Through the Memorandum of Agreement, the federal agencies established procedures necessary to coordinate their missions to reduce collisions between wildlife and aircraft (wildlife strikes) throughout the U.S. In 2005, the FAA, in cooperation with USDA-WS, published the second edition of *Wildlife Hazard Management at Airports, A Manual for Airport Personnel* (FAA 2005); the first edition was published in 1999. The FAA/USDA-WS manual presents many of the BASH management policies and procedures currently in use by the DAF.

Air Force Safety Center (AFSEC) is a Headquarters Air Force organization, under the Aviation Safety Division (SEFW) of the DAF dedicated to developing BASH management policy and guidance. AFSEC/SEFW (commonly referred to as the BASH team) is comprised of personnel who are qualified airport wildlife biologists trained in wildlife control; are experienced in wildlife ecology, land management, and flight operations; and maintain current information regarding authorized pest control equipment, techniques, and airfield vegetation management strategies. AFSEC/SEFW is responsible for the preparation of and updates to DAFI 91-212. The instruction describes approved methodologies and BMPs currently used to manage and/or reduce wildlife presence, attractants, and strikes in an airfield environment. DAFI 91-212 is updated, as needed, to reflect changes in guidance and/or airfield wildlife hazard management strategies. Host Wing or Installation Safety Offices are responsible for establishing a local program and designating a BASH Program Manager. Wing Safety, in coordination with civil engineers/natural resources, is the office of primary responsibility for development and oversight of this program.

1.3 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The **purpose** of the Proposed Action is to support airfield operational safety through implementation of wildlife hazard management strategies and BMPs. Implementation of an effective suite of wildlife hazard management strategies and BMPs would support combat capability, aircrew safety, and the prevention of damage to aircraft and infrastructure. The **need** for the Proposed Action is to ensure BMPs and wildlife hazard management strategies that reduce the attractiveness of the airfield environment to wildlife at DAF installations nationwide, comply with all applicable federal regulations, state regulations, and permitting requirements.

1.4 SCOPE OF THIS PEA

The DAF has prepared this analysis as a broad program-wide evaluation of BASH management techniques and proposed procedures. As a programmatic analysis, it is intended to support DAF installation-level programs by streamlining coordination and analysis. When a DAF installation has determined that NEPA analysis is required for a specific action, the action would be evaluated for coverage under this PEA. If a specific BASH management strategy is outside of the scope of this PEA or is expected to create impacts greater in magnitude, extent, or duration than those described in this PEA, then tiered NEPA documentation, such as a separate Environmental Assessment, would be prepared for that action.

1.5 INTERAGENCY COORDINATION AND PUBLIC INVOLVEMENT

The DAF initiated interagency coordination during the scoping phase of this PEA in accordance with the requirements of NEPA (40 CFR 1501.7(a)(1)). Scoping letters that provided a description of the Proposed Action and No Action Alternative were sent to the national headquarters of the FAA, USACE, EPA, USFWS (Migratory Birds and Ecological Services), Bureau of Land Management, and Bureau of Indian Affairs. **Appendix B** provides a representative copy of the scoping letter.

CEQ regulations direct agencies to involve the public in preparing and implementing their NEPA procedures. The DAF will publish a notice of availability of the Draft PEA and proposed Finding of No Significant Impact (FONSI) in the USA Today newspaper. The notice will run for two consecutive days and indicate the availability of the Draft PEA and proposed FONSI for a 45-day review and comment period on the internet at: https://www.afcec.af.mil/Home/Environment/National-Environmental-Policy-Act-Center/. The comments received from the public and agencies will be considered in the preparation of the Final PEA and will be provided in **Appendix B**.

Executive Order (EO) 11990, *Protection of Wetlands* and EO 11988, *Floodplain Management* direct agencies to provide the public early notification for any projects with the potential to impact wetlands or floodplains prior to approval of a FONSI and implementation of the Proposed Action. This is incorporated in the Air Force's EIAP promulgated at 32 CFR 989. The DAF would meet this requirement through the publication of notices of availability for installation-specific NEPA documents that would be prepared where there is the potential to impact wetlands or floodplains in the execution of BASH management strategies.

1.6 INTERAGENCY/INTERGOVERNMENTAL CONSULTATION

Section 7 of the Endangered Species Act (ESA) requires action proponents to consult with USFWS to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat. DAF installations would consult with USFWS where there is the potential to impact federally listed threatened and endangered species or designated critical habitat in the execution of BASH management strategies.

Section 404 of the Clean Water Act (CWA) requires action proponents to consult with USACE for actions with the potential to impact waters of the U.S. (WOTUS). DAF installations would consult with USACE, if required, where there is the potential to alter or impact a water of the U.S. in the execution of BASH management strategies.

Section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800.3(a)) requires agencies to consult with federally recognized Native American tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking. The DAF would meet this requirement through government-to-government consultation via letter and/or email when installation-specific NEPA documents would be prepared where there is the potential to impact cultural resources in the execution of BASH management strategies.

1.7 COOPERATING AGENCY

The DAF, as the lead agency for this PEA, has requested the cooperation of the USDA-WS in preparation of this PEA. **Appendix C** provides the cooperating agency correspondence.

A cooperating agency is:
"*any Federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment.*" (40 CFR 1508.5)

The **USDA-WS** is the lead federal authority in managing damage to agricultural resources, natural resources, property, and threats to human safety associated with wildlife. The primary statutory authorities for the WS program are the Animal and Damage Control Act of March 2, 1931 (46 Stat. 1468; 7 USC 8351–8352) as amended, and the Act of December 22, 1987 (Control of Wild Animals [101 Stat. 1329–331, 7 USC 8353]). The USDA-WS directives define program objectives and guide the service's activities to manage wildlife damage. The USDA-WS assists the Air Force in the preparation of installation-specific wildlife hazard assessments; the hazard assessments identify wildlife issues and habitat that may impact airfield operations.

1.8 PARTICIPATING AGENCIES

The **USFWS** is the lead federal agency in enforcing federal wildlife laws, protecting endangered species, and managing migratory birds. The USFWS is responsible for managing and regulating take of bird species that are listed as threatened or endangered under the ESA [16 USC Section 1531 *et seq*.]), bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*) that are protected under the Bald and Golden Eagle Protection Act (BGEPA [16 USC 668–668d]), or those protected under the Migratory Bird Treaty Act (MBTA [16 USC 703–712]). The take of migratory birds is prohibited by the MBTA; however, the USFWS can issue depredation permits for the take of migratory birds when certain criteria are met pursuant to the MBTA. The DAF has requested the participation of the USFWS during the development and preparation of this PEA.

The **FAA** is the regulatory agency of the U.S. Department of Transportation that is responsible for the regulation and oversight of civil aviation. While there are differences in how the FAA and the DAF implement wildlife hazard management, FAA-published wildlife management regulations and guidance have been observed by the DAF as informal BASH management BMPs at DAF-managed airfields. As such, the DAF has requested the participation of the FAA during the development and preparation of this PEA.

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2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The DAF proposes to evaluate BASH management strategies that would be implemented at CONUS DAF installations as the service continues to modernize training and air power tactics into the future. The Proposed Action includes a suite of short-, medium-, and long-term BASH management strategies, as outlined in the DAF Guidance for BASH Management, DAFI 91-212, *Bird/wildlife Aircraft Strike Hazard (BASH) Management Program* (DAF 2021a), which incorporates BMPs in a typical DAF airfield environment as detailed in wildlife damage management guidance, manuals, and literature.

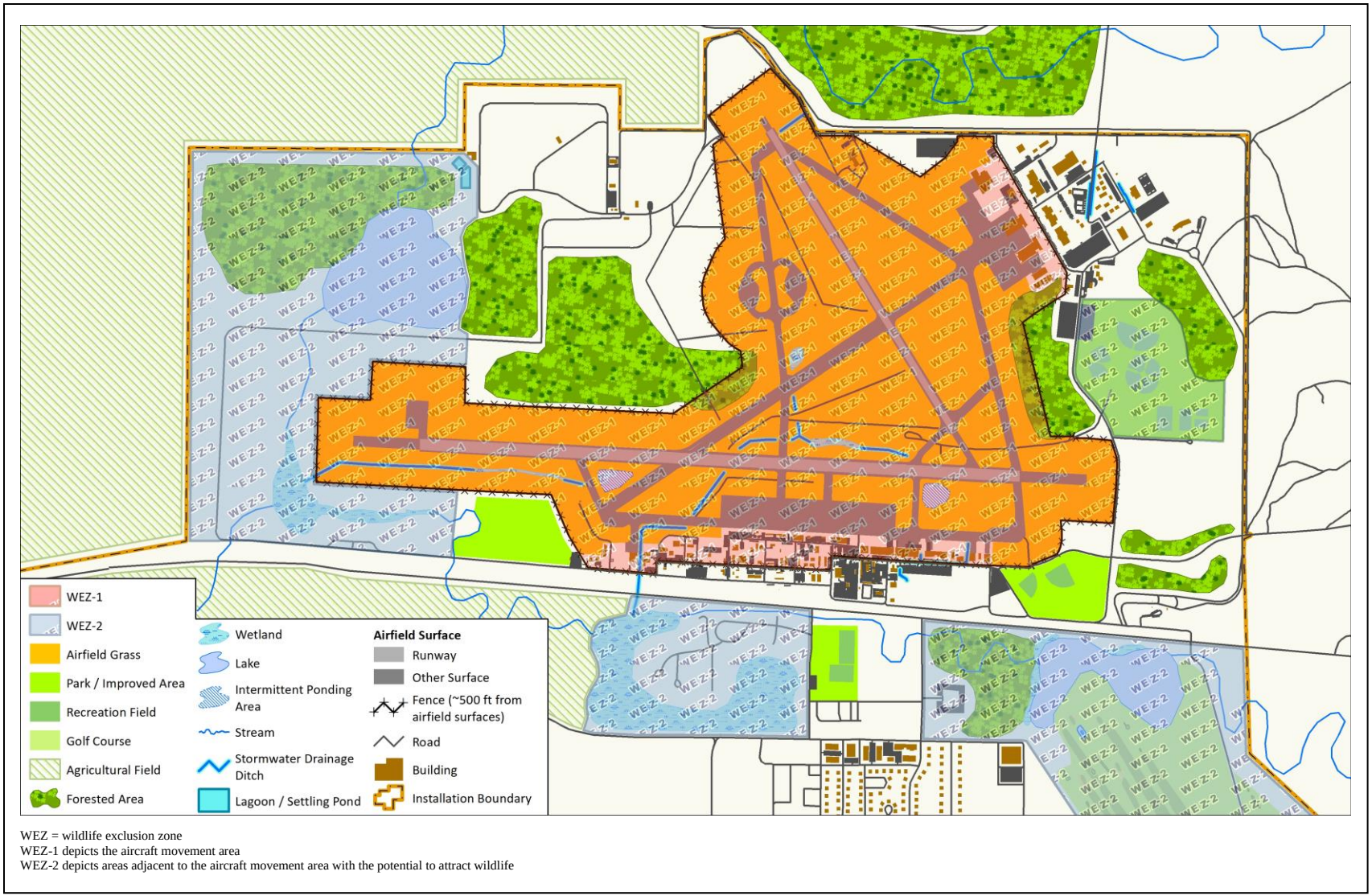
In accordance with DAFI 91-202, *The U.S. Air Force Mishap Prevention Program*, DAF installations are responsible for development and implementation of BASH plans (DAF 2020b). A BASH plan describes the measures that would be applied to prevent wildlife strikes within the "wildlife exclusion zone," a locally defined, airfield-specific area where the goal is to minimize the occurrence of wildlife (DAF 2021a). The wildlife exclusion zone encompasses the ground-based Aircraft Movement Area (runway, taxiway, clear zone[1]) and extends to any other areas adjacent to the Aircraft Movement Area with the potential to attract wildlife. These areas could include open water sources such as ponds, lakes, streams, ditches, wetlands and lagoons; forested areas; open grassy areas such as parks, golf courses, athletic fields; and agricultural fields. The Installation BASH Program manager is responsible for designating a wildlife exclusion zone. A depiction of wildlife exclusion zone within a typical DAF installation airfield is shown in **Figure 2.1-1**.

2.2 SELECTION STANDARDS

NEPA and CEQ regulations require consideration of reasonable alternatives before undertaking any Proposed Action. "Reasonable alternatives" are those that could meet the purpose of and need for the Proposed Action. Per the requirements of 32 CFR 989.8(b)–(c), the Air Force EIAP regulations, selection standards are used to identify alternatives that meet the purpose of and need for the Proposed Action. The potential alternatives that meet the purpose and need were evaluated against the following selection standards:

- Supports unique Air Force-specific military operational requirements
- Supports security and safety in a military airfield environment
- Supports an adaptive management approach to wildlife hazard management.

[1] The clear zone is defined as an obstruction-free surface (except for features essential for aircraft operations) on the ground symmetrically centered on the extended runway centerline beginning at the end of the runway and extending outward 3,000 feet. The clear zone width is 3,000 feet (1,500 feet to either side of runway centerline).



WEZ = wildlife exclusion zone
WEZ-1 depicts the aircraft movement area
WEZ-2 depicts areas adjacent to the aircraft movement area with the potential to attract wildlife

Figure 2.1-1. Wildlife Exclusion Zone within a Typical DAF Installation Airfield Environment

2.3 ALTERNATIVES CARRIED FORWARD FOR ANALYSIS

BASH management strategies presented in DAFI 91-212 prescribe wildlife hazard management strategies that are accepted and used nationally on both military and civilian airfields. Based on the purpose and need for the Proposed Action and selection standards, only the Proposed Action and the No Action Alternative will be carried forward for analysis in this PEA.

2.3.1 Alternative 1: Proposed Action

Adaptive Management: an approach taken to utilize approved BASH management strategies interchangeably depending on existing conditions and changing missions needs within the context of an approved BASH plan.

The DAF proposes to implement an adaptive management approach to BASH management utilizing short-, medium-, and long-term management strategies and non-lethal and lethal techniques, as deemed appropriate, to optimize the management of wildlife hazards within the wildlife exclusion zone on all CONUS DAF installations. These strategies comply with all applicable federal regulations, state regulations, and permitting requirements. The Proposed Action, in accordance with DAFI 91-212 outlines an approach to BASH management that supports unique DAF airfield operational and security requirements as well as airfield operation safety in general. Implementation of the Proposed Action would ensure an adaptive management approach to BASH is optimized for consistency with scientifically evidenced BMPs as detailed in wildlife damage management guidance, manuals, and literature.

2.3.2 Alternative 2: No Action Alternative

CEQ regulations require that an agency "include the alternative of no action" as one of the alternatives it considers (40 CFR 1502.14[c]). Under the No Action Alternative, BASH management strategies would continue. However, a comprehensive suite of strategies to address ongoing airfield hazards and management of resources to comprehensively support the DAF mission enterprise-wide would not be implemented. The No Action Alternative would not ensure implementation of an adaptive management approach to BASH across the enterprise. Additionally, maintaining *status quo* under the No Action Alternative would not ensure BASH management strategies enterprise-wide are implemented in accordance with all applicable federal and state regulations and all relevant permitting requirements. The No Action Alternative would not ensure that the BASH management at individual DAF-managed installations is optimized for the support of mission sustainment. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action are compared.

2.4 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR ANALYSIS

2.4.1 Alternative 3: Utilize Hunting in Conjunction with DAF BASH Management Program

This alternative would encompass the same short-, medium-, and long-term management strategies and non-lethal and lethal techniques considered under the Proposed Action. Although hunting would have the potential to decrease populations in some species, permitting hunting in and around airfields would present safety and security hazards as well as have the potential to impact airfield operations, which would not support mission sustainment. Game species preferred by recreational hunters would not necessarily be the same species presenting wildlife hazards on and around airfields. Additionally, the goal of recreational hunting differs from BASH management in that recreational hunting endeavors to sustain species populations for future recreation, whereas BASH management endeavors to eliminate the hazards presented by species existing in the airfield environment. Permitting recreational hunting on and around

the airfield would present safety and operational hazards, would not result in optimization of wildlife hazard management strategies, and is not considered a BMP for BASH management. Therefore, this alternative is not carried forward for detailed analysis.

2.4.2 Alternative 4: Implement Only FAA Standardized BASH Management Strategies Used at Civilian Airports

BASH management strategies used by the FAA on and around civilian airfields are often consistent with those utilized by the DAF. This alternative would evaluate the similar strategies, including BASH management guidance, manuals, and literature, and incorporate applicable federal regulations, state regulations, and permitting requirements. However, there are some procedural and operational differences in how the DAF implements wildlife hazard management as compared to the civil authorities. One operational difference is the DAF regularly implements operational avoidance procedures for BASH management, which the FAA does not implement. Another difference is the DAF requires mandatory strike reporting for BASH mishaps. While the FAA does track strike reporting, the stipulations are not mandatory enterprise-wide. Lastly, unlike civilian airports managed by the FAA, the DAF must comply with the Sikes Act by preparing BASH management plans and INRMPs; INRMPs specify how natural resources are to be managed. Alternative 4 would not ensure that all applicable federal and state laws and all relevant permitting requirements, including the Sikes Act, are met. Additionally, Alternative 4 would not support the procedural and operational differences in how BASH is implemented within the DAF. Therefore, this alternative is not carried forward for detailed analysis.

2.5 PROPOSED ACTION

The objective of BASH management is to actively modify and prevent wildlife hazard attractants within an airfield environment. Airfield grounds maintenance activities alone would not be sufficient in reducing hazardous populations of birds and wildlife in the airfield. As such, an integrated approach using various methods would be required. The methods chosen would depend largely on the installation's situation and the species involved. The approach includes a selection of the following: habitat modification/management, harassment, entrapment/relocation, and depredation. The Proposed Action will evaluate these methods that are divided into two categories: 1) passive management, and 2) active controls.

2.5.1 Passive Management

Passive management involves medium- and long-term strategies to manage and/or modify the local airfield environment to eliminate or reduce conditions that are attractive to wildlife. The best practices that have proven, in most situations, to successfully mitigate wildlife threats in an airfield environment are listed below.

Passive Management Strategies:

- Mow to maintain grass height between 7 and 14 inches
- Fertilize grass
- Seed bare areas
- Apply herbicides
- Apply pesticides
- Apply non-lethal chemical repellent (avian control substance)

- Remove dead vegetation
- Remove dense stands of trees and scrub
- Remove fruiting trees/shrubs
- Remove dead birds and animals
- Remove obsolete structures and poles
- Regrade or fill low surface points
- Maintain canals, ditches, streams, and holding ponds
- Remove, drain and/or fill standing, ephemeral water bodies (i.e., wetlands, ponds, ditches)
- Install and maintain minimum acceptable height airfield fencing
- Install spike strips or netting in hangars
- Utilize lifelike effigies.

To reduce maintenance costs, a few DAF installations utilize agricultural programs on or surrounding their respective airfields. The programs range from crop and hay out leases to grazing and reforestation. The types of crops grown, and the agricultural methods used, may have significant effects on local bird populations. The best practices that would successfully mitigate wildlife threats under these circumstances (DAF 2021a; DAF 2020a; FAA 2005) include:

- Not permitting agricultural activity within 500 feet of the Aircraft Movement Area and other future airfield exclusions
- Not cultivating grain crops within the airfield
- Not permitting livestock grazing on active airfields
- Evaluating harvesting and planting schedules to reduce invertebrate exposure that is a bird attractant
- Coordinating with installation personnel (i.e., airfield management, safety, and civil engineering) during periods of crop planting, cultivating, harvesting, or burning.

Open water sources, such as ponds, lagoons, and wastewater treatment areas and other incompatible land uses such as landfills attract waterfowl, shorebirds, and other hazardous bird species, respectively. The following strategies are recommended if alteration or relocation of the water source(s) or other incompatible land uses would not be possible (DAF 2021a; FAA 2005):

- Install aeration pumps, agitation equipment, fountains, plastic bird balls/discs or grid wires over the water body
- Discharge sewage effluent during reduced flying operations where spray fields are utilized
- Maintain a small working area and cover waste material immediately
- Ensure garbage cans and other waste receptacles are covered and serviced regularly.

In addition, the DoD created the Readiness and Environmental Protection Integration (REPI) program to explore policy and regulatory solutions to reduce incompatible off base land uses and development. The REPI program is described in greater detail in **Section 3.9**, ***Land Use***.

Table 2.5-1 provides more detail for each of the listed passive management strategies and states whether consultation under the ESA, permit under the MBTA, or similar regulatory consultation or coordination may be required.

Table 2.5-1. Evaluation of Passive Management Strategies

Strategy	Intended Result	Consultation or Permit Required?
Mow to: maintain grass/vegetation height within and around the airfield between 7 and 14 inches; maintain grass/vegetation height at or below 7 inches within 10 feet surrounding all airfield navigation aids or visual air navigation facilities; maintain vegetation to the edge of drainage ditches.	Discourage use by flocks of birds; vegetative cover exceeding 14 inches may attract some ground nesting birds, provide cover or food for rodents that may in turn attract predatory birds and mammals, and cover for larger animals (deer, coyotes, turkeys, etc.).	Consultation with USFWS (ESA Section 7) would be required if federally listed threatened or endangered species are present. A permit under the MBTA would be required if mowing would result in take of adult birds or active nests (i.e., those with eggs or chicks). Consultation would be required if activities occur within a state's coastal zone in accordance with the Coastal Zone Management Act and the state's Coastal Zone Management Program.
Fertilize established grass around the airfield as necessary to stimulate growth; rate and frequency of application may vary and should be based on soil test results.	Promote a uniform cover; a monoculture of grasses may be more effective in discouraging seed-eating birds from feeding on the airfield.	Consultation with USFWS (ESA Section 7) would be required if federally listed threatened or endangered species are present.
Seed bare and denuded areas. Plant grasses that are compatible with aviation safety and adapted to poor soils where applicable; bare areas may require additional soil amendments (e.g., on site composting, fertilizer, lime, or gypsum) and soil stabilization materials (e.g., hay mulch, erosion blankets) to produce an adequate stand of vegetation.	Eliminate birds resting in the airfield; exposed grit is ingested by birds to aid in digestion of seeds.	Consultation with USFWS (ESA Section 7) would be required if federally listed threatened or endangered species are present.
Apply herbicides to control weeds and invasive species. Broad-leafed plants attract a variety of wildlife, they may produce seeds or berries, and they may limit grass growth while providing increased cover. Growth retardants should be tested on small test plots before use on larger areas.	Establish a uniform monoculture of grasses that may be more effective in discouraging seed-eating birds from feeding on the airfield.	Consultation with USFWS (ESA Section 7) would be required if federally listed threatened or endangered species are present. Herbicides would be applied in accordance with product label instructions, applied by or observed by a licensed/certified applicator, and follow EPA guidelines. Herbicide application would be in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a).

Table 2.5-1. Evaluation of Passive Management Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Apply insecticides (ground and aerial) and rodenticide; fumigation for burrowing wildlife and insects.	Control insects and invertebrates, rodents, and burrowing rodents (woodchucks, ground hogs, prairie dogs) that attract prey species. *potential impact to non-target pests or species (i.e., honeybees and other pollinators).	May need to consult with USFWS (ESA Section 7) and state Department of Fish and Game (or similar regulatory office). Insecticides would be applied in accordance with product label instructions, applied or observed by a licensed/certified applicator, and follow EPA guidelines; application would be in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a).
Apply non-lethal chemical repellent (avian control substance) to roosting/perching surfaces.	Elicit a negative reaction/experience (painful or noxious) in birds and wildlife to scare off other birds and wildlife.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species or bald and golden eagles protected under the BGEPA would be affected. Chemicals would be used in accordance with chemical label, applied /or observed by a licensed/certified applicator, and follow EPA guidelines.
Remove dead vegetation and brush.	Reduce potential cover for wildlife.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species or bald and golden eagles protected under the BGEPA would be affected. A permit under the MBTA would be required if removal of dead vegetation and brush would result in take of adult birds or active nests (i.e., those with eggs or chicks).

Table 2.5-1. Evaluation of Passive Management Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Remove dense stands of trees and scrub.	Reduce roosting sites and cover for wildlife.	May need to consult with USFWS (ESA Section 7) if trees and scrub provide habitat for federally listed threatened or endangered species or bald and golden eagles protected under the BGEPA. A permit under the MBTA would be required if removal of trees and scrub would result in take of adult birds or active nests (i.e., those with eggs or chicks).
Remove fruiting trees and shrubs.	Eliminate a food source; many produce seeds or berries which attract birds.	May need to consult with USFWS (ESA Section 7) if fruiting trees and shrubs provide habitat for federally listed threatened or endangered species. A permit under the MBTA would be required if removal of fruiting trees/shrubs would result in take of adult birds or active nests (i.e., those with eggs or chicks).
Remove dead birds and animals from the airfield.	Quick removal will avoid attracting wildlife.	No consultation required. Bird remains would be collected and sent to the Smithsonian Institution Feather Identification Lab in accordance with DAFI 91-212, *Bird/wildlife Aircraft Strike Hazard (BASH) Management Program* (DAF 2021a).
Remove obsolete structures and poles.	Eliminate bird perching sites.	May need to consult with State Historic Preservation Office (SHPO) for removal and/or demolition of structures per 36 CFR 800.3(a).
Regrade or fill low surface points and eliminate fresh water sources that retain water for more than 48 hours, such as ephemeral wetlands, ponds, and ditches.	Reduce areas that attract insects and are bird and wildlife attractants.	May need to consult with USACE (Section 404) if fill material would be placed in WOTUS. May need to consult with USFWS (ESA Section 7) if altering or removing habitat for federally listed threatened or endangered species.

Table 2.5-1. Evaluation of Passive Management Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Manage vegetation within canals, ditches, streams, and holding ponds.	Eliminate vegetation within that may provide food or cover for wildlife.	May need to consult with USACE (Section 404) if altering or impacting WOTUS via vegetation clearing, regrading, soil excavation or removal, or if fill material would be placed in WOTUS. May need to consult with USFWS (ESA Section 7) if altering or removing habitat for federally listed threatened or endangered species. A permit under the MBTA would be required if vegetation management would result in take of adult birds or active nests (i.e., those with eggs or chicks).
Remove, drain and/or fill standing water bodies (i.e., wetlands, ponds, ditches); if unable to drain/fill, install physical barriers such as netting, bird balls, wire grids, pillows.	Reduce wildlife attractants.	May need to consult with USACE (Section 404) if altering or impacting WOTUS. May need to consult with USFWS (ESA Section 7) if altering or removing habitat for federally listed threatened or endangered species.
Install and maintain an 8-foot chain link fence topped with 3 strands of barbed wire with a 4-foot skirt buried in the ground at a 45 degree angle. Fences should be marked.	Exclude and prevent terrestrial wildlife from leaping over the fence and animals from digging underneath the fence. Marking may reduce bird collisions.	Consultation with USFWS (ESA Section 7) would be required if federally listed threatened or endangered species habitat are present. May need to consult with SHPO per 36 CFR 800.3(a) as excavation could damage archaeological or historic sites.
Install spike strips or netting in hangars for when hangar doors must be open.	Discourage and prevent bird perching, loafing, nesting, and roosting.	No consultation required.
Utilize realistic effigies (e.g., taxidermy or replica carcasses) in distressed positions.	Deter birds and wildlife.	May need to consult with state and federal authorities before considering displaying taxidermy effigies; possession of some carcasses may require permit authorization. Taxidermy specimens of migratory birds would require a permit under the MBTA. Authorization for possession and use can be included under a depredation permit.
Do not permit agricultural activity within 500 feet of the Aircraft Movement Area and other future airfield exclusions.	Eliminate a food source that attracts wildlife.	No consultation required.
Do not cultivate grain crops within the airfield.	Eliminate a food source that attracts wildlife.	No consultation required.
Do not permit livestock grazing on active airfields.	Eliminate a significant safety issue.	No consultation required.

Table 2.5-1. Evaluation of Passive Management Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Evaluate harvesting and planting schedules.	Reduce invertebrate exposure that is a bird attractant.	No consultation required.
Coordinate with installation personnel (i.e., airfield management, safety, natural resources manager, and civil engineering) during periods of crop planting, cultivating, harvesting, or burning.	Avoid negative impact to airfield flight safety as these activities may temporarily increase airfield bird attractants.	No consultation required.
Install aeration pumps, agitation equipment, fountains, plastic bird balls/discs or grid wires (placed over the water body).	Dissuade attracting birds to the water source.	No consultation required.
Discharge sewage effluent during reduced flying operations where spray fields are utilized.	Reduce wildlife attractants.	No consultation required.
Minimize the exposed land fill wastes by maintaining a small working face; cover waste material immediately.	Reduce wildlife attractants.	No consultation required.
Cover and regularly service garbage cans and waste receptacles.	Reduce wildlife attractants.	No consultation required.
DoD REPI Program	Reduce incompatible off base land uses and development that could attract wildlife.	No consultation required.

2.5.2 Active Controls

Active controls are physical actions taken to disperse or remove a bird/wildlife hazard. These short-term strategies, listed below, would be taken to provide immediate relief of wildlife hazards within the local airfield environment (DAF 2021a; American Veterinary Medical Association 2020; FAA 2005). Utilizing a combination of different dispersal tools may provide the best line of defense for immediate hazards. Harassment, entrapment/relocation, and depredation have been proven effective in dispersing wildlife from airfields. When used together or in an alternating manner, these techniques may complement each other's effectiveness over time. **Table 2.5-2** provides more detail for each of the active controls listed and states whether consultation under the ESA, permit under the MBTA, or similar regulatory consultation or coordination may be required.

Active Controls Strategies:

- Harassment
  - Auditory harassment
  - Paintballs
  - Avian lasers
  - Radio-controlled vehicles
  - All-terrain vehicles (ATVs)
  - Birds of Prey
  - Canine programs
- Entrapment / Relocation
  - Chemical immobilization
  - Non-lethal trapping
- Depredation
  - Lethal chemicals
  - Lethal trapping
  - Nest removal
  - Egg removal and destruction
  - Shooting.

Table 2.5-2. Evaluation of Active Controls Strategies		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Harassment		
Auditory harassment consisting of: • pyrotechnics (explosive noise-producing projectiles) • air horns, vehicle horns, and "clappers" • cannons/exploders that generate a shotgun-sounding blast • recorded avian distress calls.	Scare/deter birds and wildlife when used interchangeably and/or with associated follow-up stimuli.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Hazing of eagles does not require a permit as long as it does not disturb[2] eagles. A depredation permit is not required for non-lethal harassment of migratory birds on the airfield according to 50 Code of Federal Regulation 21.100, *Depredation Permits*.
Paintballs and rubber or plastic projectiles, fired from paint-ball guns and 12-gauge shotguns.	Repel birds and wildlife.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. A depredation permit is not required for non-lethal harassment of migratory birds on the airfield according to 50 Code of Federal Regulation 21.100, *Depredation Permits*.
Use of avian lasers.	Scares/deters birds when used in low-light conditions; disperses birds from hangers.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected.
Radio-controlled vehicles (aircraft, vehicles, boats).	Disperse birds and wildlife from grassy areas and large ponds away from the airfield.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Hazing of eagles does not require a permit as long as it does not disturb eagles.
All-terrain vehicles.	Disperse birds and wildlife from the airfield environment.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Hazing of eagles does not require a permit as long as it does not disturb eagles. May need to consult with SHPO if cultural resources would be affected per 36 CFR 800.3(a).

[2] BGEPA regulations define "disturb" as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.6).

Table 2.5-2. Evaluation of Active Controls Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Trained birds of prey.	Immediate dispersal of birds in the airfield; birds dispersed by trained birds of prey are likely to remain away from the airfield for longer periods. Potential for bird strikes associated with the trained birds of prey themselves.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Hazing of eagles does not require a permit as long as it does not disturb eagles. A Special Purpose – Abatement permit from the USFWS is required for the use of captive-bred raptors protected under the MBTA for depredation situations.
Harassment (cont.)		
Canine programs using Border collies or other breeds of dogs.	Disperse geese, ground nesting birds, and wildlife from airfield.	May need to consult with USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Hazing of eagles does not require a permit as long as it does not disturb eagles.
Entrapment / Relocation		
Chemical immobilization of birds.	Capture and release of birds. *potential impact to non-target wildlife.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Authorization under the BGEPA is required to trap and possess bald or golden eagles. A permit is required under the MBTA to trap and possess migratory birds.
Non-lethal trapping.	Capture and release of wildlife. Raptors captured and translocated could be banded for identification purposes using U.S. Geological Survey (USGS) approved metal leg-bands appropriate for the species.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) before relocating an animal/bird outside installation boundaries. Banding raptors would occur pursuant to a banding permit issued by the USGS. Authorization under the BGEPA is required to trap and possess bald or golden eagles. A permit is required under the MBTA to trap and possess migratory birds.

Table 2.5-2. Evaluation of Active Controls Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Depredation		
Lethal chemicals. • Avitrol is registered for repelling pigeons, house sparrows, blackbirds, grackles, cowbirds, starlings, crows, and gulls from feeding, nesting, loafing, and roosting sites. Avitrol-treated bait is diluted with untreated bait so most birds in the flock do not ingest treated bait. • Starlicide (or DRC-1339) is registered for use in bird population management; it can be formulated with a variety of baits.	Reduce hazardous bird populations. Birds eating Avitrol-treated baits react with distress symptoms and calls, behaviors that frighten away other birds in the flock. Although registered as a "frightening agent", it is lethal to the birds that eat treated baits. Control starlings, pigeons, gulls, ravens, and blackbirds. *potential impact to non-target wildlife.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Authorization under the BGEPA is required for lethal take of bald or golden eagles. A permit is required under the MBTA for lethal take of migratory birds. Pesticides would be applied in accordance with pesticide label requirements, applied or observed by a licensed/certified applicator, and follow EPA guidelines; application would be in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a). Only USDA-/WS personnel or persons working under their direct supervision can use DRC-1339 (USDA 2019a).
Lethal trapping. Body gripping traps can be used for medium sized mammals; leg-hold traps and neck snares can be used for smaller mammals and raptors.	Reduce hazardous bird and wildlife populations. *potential impact to non-target wildlife.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Authorization under the BGEPA is required for lethal take of bald or golden eagles. A permit is required under the MBTA for lethal take of migratory birds.
Nest removal.	Deter birds from nesting in the same area again.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. A permit is not needed to destroy inactive migratory bird nests, provided the nest is destroyed and not kept. An inactive bird nest is one without eggs or chicks present. A permit is required to destroy an active bird nest (one with eggs or chicks present). A different permit is required to disturb or destroy nests of bald eagles or golden eagles, regardless of whether it is active or inactive.
Eggs can be removed and destroyed via non-chemical egg treatment (addling/shaking, puncturing).	Suppress reproduction and slow population growth of target species identified as a flight safety hazard.	A permit is required if birds protected under the MBTA would be affected.

Table 2.5-2. Evaluation of Active Controls Strategies (cont.)		
Strategy	**Intended Result**	**Consultation or Permit Required?**
Shooting may involve the use of shotguns, air rifles, rimfire, or centerfire rifles.	Reduce hazardous bird and wildlife populations.	May need to consult with state Department of Fish and Game (or similar regulatory office) and USFWS (ESA Section 7) if federally listed threatened or endangered species would be affected. Authorization under the BGEPA is required for lethal take of bald or golden eagles. A permit is required under the MBTA for lethal take of migratory birds.

2.6 NO ACTION ALTERNATIVE

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Standard operating procedures (SOPs) at each base to support airfield operational safety and wildlife damage management and conservation would continue; however, a strategy for enterprise-wide implementation of the suite of management strategies and BMPs available in reference manuals and guidance would not be developed and analyzed. Under the No Action Alternative, comprehensive optimal management strategies to address ongoing airfield hazards, risks to airfield safety, and management of resources to comprehensively support the DAF mission enterprise-wide would not be implemented. The No Action Alternative is carried forward for analysis consistent with CEQ guidelines to provide a baseline against which to measure the impacts of the Proposed Action.

2.7 COMPARISON OF ENVIRONMENTAL IMPACTS

Table 2.7-1 provides a summary of the potential environmental impacts associated with the Proposed Action and the No Action Alternative.

Table 2.7-1. Comparison of Environmental Impacts		
Resource Section	**Proposed Action**	**No Action Alternative**
Airfield Operations and Management	Passive Management: vegetation management (mowing, removing dead vegetation and dense tree stands), removing standing water bodies, installing and maintaining exclusionary fencing, and use of targeted pesticides would reduce the presence of wildlife in the airfield environment. Active Controls: auditory harassment/avian distress calls may induce a temporary hazard when applied. Entrapment/relocation and depredation strategies would provide short-term relief until permanent corrective actions could be implemented. Summary: impacts to airfield operations from implementation of passive management and active controls would be positive; no significant impact would be anticipated at any of the CONUS DAF installations.	Impacts to airfield operations and management beyond those experienced from existing and ongoing BASH management strategies and SOPS would not occur. Baseline conditions would continue and would be installation-specific.
Biological Resources	Passive Management: habitat modification, incorporating anti-perching and nesting deterrent devices, constructing/maintaining perimeter fencing, managing water resources to reduce attractiveness to wildlife, use of visual deterrents and non-lethal chemical repellents, and incorporating policies such as removing carcasses, managing crops and covering garbage and waste receptacles would minimize wildlife collisions with aircraft. Active Controls: harassment protocols, non-lethal chemical repellants, entrapment or relocation, and depredation measures would impact biological resources. Specifically targeting hazardous species and following all state and federal regulation and permits, would not result in significant impacts to biological resources at a population level. Summary: no significant impact to biological resources, including those protected by the ESA, MBTA, or BGEPA would be anticipated from implementation of passive management and active controls strategies at any of the CONUS DAF installations. Impacts should not noticeably affect a protected species population since take is controlled and monitored by the USFWS or state wildlife agencies.	Impacts to biological resources beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.
Water Resources	Passive Management: regrading or filling low surface points that retain water; managing vegetation within surface water; removing, draining or filling standing, ephemeral water; installing physical barriers within waterbodies; and installing aeration pumps or agitation equipment within waterbodies, and pesticide application would be anticipated to have an insignificant impact; however, filling or draining water resources could have a significant impact and would require substantial permitting through state and federal agencies. Aerial application of pesticides would require state or EPA CWA National Pollutant Discharge Elimination System pesticide permits prior to the activity. Active Controls: harassment measures, entrapment/relocation and depredation controls applied to or focused adjacent to water resources would have a small or insignificant impact. Summary: no significant impact to water resources would be anticipated at any of the CONUS DAF installations; however, if WOTUS were impacted, complex permitting, and mitigation would be required through state and federal agencies.	Impacts to water resources beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

Table 2.7-1. Comparison of Environmental Impacts (cont.)		
Resource Section	**Proposed Action**	**No Action Alternative**
Cultural Resources	Passive Management: ground disturbing activities (demolition/removal of obsolete structures and/or installation of poles and digging/excavation for the construction of chain link fencing) may require consultation under the NHPA. Active Controls: use of ATVs may require consultation under the NHPA. Summary: no adverse or significant impact to cultural resources at any of the CONUS DAF installations would be anticipated; consultation per Section 106 of the NHPA would be initiated for activities that have the potential to impact known cultural resources or for discovery of unknown cultural resources.	Impacts to cultural resources beyond those experienced from existing and ongoing BASH management strategies and SOPs are unlikely to occur. Baseline conditions would continue and would be installation-specific.
Hazardous Materials and Wastes	Passive Management: removal of structures and procurement, use, disposal, and application of pesticides, including aerial application would be performed by qualified personnel and follow SOPs. Active Controls: avicides and restricted use pesticide Starlicide (i.e., DRC-1339) would be EPA-approved, follow EPA guidelines, used in accordance with the pesticide label. Pesticides would be applied by/or observed only by state-certified personnel authorized to mix or apply the pesticides. Only USDA-WS personnel or persons working under their direct supervision are authorized to use Starlicide. Summary: no significant impact to this resource at any of the CONUS DAF installations would be anticipated; established DAF, DoD, EPA, and USDA-WS guidelines and procedures for the procurement and use of hazardous materials and management and disposal of hazardous wastes would be followed.	Impacts to hazardous materials and wastes beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.
Human Health and Safety	Passive Management: removal of structures, equipment used in vegetation management, procurement, use, disposal, and application of pesticides, including aerial application, would be performed by qualified personnel and follow SOPs and use of personal protective equipment. Medical surveillance of personnel involved in pesticide mixing and application would prevent acute pesticide-related illness and/or injury. Active Controls: harassment, entrapment, and depredation measures would be performed by qualified personnel and follow SOPs to include use of personal protective equipment. Medical surveillance of personnel involved in pesticide mixing and application would prevent acute pesticide-related illness and/or injury. Summary: no significant impact would be anticipated to human health and safety at any of the CONUS DAF installations; none of the passive management or active control measures would substantially increase the risk to the health and safety of personnel or create conditions that were in violation of any federal Occupational Health and Safety Administration regulations, DAF instructions, state, or local regulations.	Impacts to human health and safety beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

Table 2.7-1. Comparison of Environmental Impacts (cont.)		
Resource Section	**Proposed Action**	**No Action Alternative**
Air Quality	Passive Management: vehicles and equipment used in construction activities would produce criteria pollutant emissions and generate fugitive dust; measures to minimize these effects (e.g., newer model equipment, spraying water on exposed soil) would be employed. Active Controls: ATVs would produce criteria pollutant emissions; use of newer model ATVs would minimize the effect. Summary: no significant impact to air quality at any CONUS DAF installation would be anticipated. Combustive and fugitive dust emissions would produce localized, short-term elevated air pollutant concentrations which would not result in long-term or significant impacts. Activities that involve combustive equipment would contribute to the global greenhouse gas inventory, although the contribution would be minimal.	Impacts to air quality beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.
Noise	Passive Management: noise generated from vehicles and equipment used to mow and maintain grass, pesticide application (i.e., tractors, trucks or small aerial vehicles), and construction/demolition activities would not be anticipated to alter the noise environment at any installation. Active Controls: sudden noise generated during use of pyrotechnics, air horns, cannons, distress calls, and rifles/shotguns would be loud, but not continuous and used occasionally to provide immediate relief of wildlife hazards within the local airfield environment. Noise generated by ATVs or radio-controlled vehicles would be minor and not significant. Summary: no significant impact or change to the ambient noise environment at any of the CONUS DAF installations would be anticipated. Implementation of passive management and active controls strategies would take place in an environment dominated by military aircraft.	Impacts to noise beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.
Land Use	Passive Management: strategies that involve maintenance of vegetation and wildlife would not require a change in an installation's land use or be anticipated to impact existing land use designations outside of an installation's boundary. Active Controls: strategies that involve active controls would not require a change in an installation's land use or be anticipated to impact existing land use designations outside of an installation's boundary. Summary: no significant impact to land use at any of the CONUS DAF installations would be anticipated. Installations would need to work with the local community, government, and federal agencies through use of the Air Installations Compatible Use Zones, Joint Land Use Study, or Readiness and Environmental Protection Integration programs to achieve or maintain compatible off base land uses.	Impacts to land use beyond those experienced from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

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3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter presents a description of the environmental conditions for resources potentially affected by implementation of BASH management procedures at CONUS DAF installations. As a programmatic document, this PEA considers a broad program-wide evaluation of the suite of short-, medium-, and long-term BASH management strategies that could be applied. The impact analysis presented in this PEA will be a general discussion of the potential impacts to resources under the Proposed Action and No Action Alternative. Installations will be required to evaluate the potential environmental impacts to all resources from implementation of BASH management procedures and to identify and determine the level of consultation, mitigation, and/or permitting requirements needed when conducting the installation-specific tiered NEPA analysis.

RESOURCES NOT CARRIED FORWARD FOR ANALYSIS

The potential impacts to the following resource areas from implementation of the BASH management procedures would be negligible or non-existent; as such, they were not carried forward for detailed analysis in this PEA:

Environmental Justice addresses the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs on minority and low-income populations. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, mandates that federal agencies identify and assess environmental health and safety risks that may disproportionately affect children as a result of the implementation of federal policies, programs, activities, and standards. The potential for the application of BASH management procedures at DAF installations, as described in **Section 2.5**, to affect people or to disproportionately affect minority or low-income populations or to pose environmental health and safety risks to children would be negligible. BASH management procedures would be implemented within the boundary of a secured DAF installation and would occur within the vicinity of an active military flightline, which has additional security fencing in place. In addition, military family housing and child development centers are located away from flightline areas. As such, this resource has been eliminated from future discussion in this PEA.

Socioeconomics is generally the study and analysis of the human environment, specifically the study of human population, employment, personal income, and housing. The application of BASH management procedures at CONUS DAF installations would not be anticipated to affect the population, employment opportunities, personal income, or housing at a local or regional level as no new personnel positions would be created and the purchase of materials and supplies would result in minor, short-term beneficial impacts to the local and regional economies. A negligible impact to this resource would be anticipated; therefore, socioeconomics is not considered further in this PEA.

Earth Resources includes geology, topography, and soils. A few of the passive management strategies presented in **Table 2.5-1** would require ground disturbance. These include removal of obsolete structures or poles, regrading and/or filling low surface points, and installing chain link fencing. None of these activities would be expected to adversely impact the geology, topography, or alter the soil profile at any installation. Therefore, this resource is not considered further in this PEA.

Infrastructure and Utilities generally considers systems such as potable water, sanitary sewer, storm drainage, heating and cooling, natural and landfill gas, electric service, and communications service. BASH measures do not involve the modification, disruption, or use of infrastructure or utility systems or services. As such, this resource has been eliminated from discussion in this PEA.

RESOURCES CARRIED FORWARD FOR ANALYSIS

In compliance with NEPA, CEQ regulations, and the DAF EIAP, the affected environment focuses on only those resources with the potential to be impacted by implementation of BASH management procedures within an installation's wildlife exclusion zone. The discussion of the affected environment and associated environmental impacts analysis presented here focuses on the following resource areas: airfield operations and management, biological resources, water resources, cultural resources, hazardous materials and wastes, human health and safety, air quality, noise, and land use.

3.1 AIRFIELD OPERATIONS AND MANAGEMENT

The FAA, regulatory agency of the U.S. Department of Transportation, has the overall responsibility for managing the nation's airspace. Airspace within a DAF installation airfield is FAA-classified Class B controlled airspace; Class B controlled airspace extends from the surface to 10,000 feet mean sea level surrounding the installation airfield. Flight operations within the installation controlled airspace are conducted under the supervision of air traffic control and include takeoffs/departures, landings/approaches, and closed pattern operations.

3.1.1 Affected Environment

The type of operational aircraft, airfield configuration, and number and length of the runway or runways are installation-specific features that define an airfield environment. DAFI 91-202, The *U.S. Air Force Mishap Prevention Program* (DAF 2020b) which implements Air Force Policy Directive 91-2, *Safety Programs* (DAF 2019b), directs that each installation develops a flight safety program that includes data of all local wildlife strike hazards, potential effects on missions, and probable solutions.

In the airfield environment, risks to wildlife are greatest during takeoffs, landings, and closed pattern operations. The wildlife exclusion zone (refer to **Section 2.1** and **Figure 2.1-1**) encompasses the installation airfield and extends upward into the airfield's closed-traffic pattern airspace and low-level flight corridors and extends outward to any other areas adjacent to the airfield with the potential to attract wildlife. Data collected and analyzed by the DAF for 32 installations (years 2007 to 2017) indicate that most BASH incidences occur near the airfield during take-off and landing events with nearly 60 percent of BASH incidents at or below 500 feet above ground level (AGL) and 98 percent at or below 3,000 feet AGL (AFCEC 2018).

3.1.2 Environmental Consequences

Impacts to airfield operations and management would be considered adverse if the environments within the wildlife exclusion zone maintained the types of features that attract wildlife. These features, as presented in **Section 2.1** could include open water sources such as ponds, lakes, streams, ditches, wetlands and lagoons; forested areas; open grassy areas such as parks, golf courses, athletic fields; and agricultural fields.

3.1.2.1 Proposed Action

Passive Management

The selection of a suite of medium- and long-term passive management strategies presented in **Section 2.5.1** and defined in **Table 2.5-1** would vary depending on the installation location within the CONUS, the respective flying mission, and wildlife found within the installation environment. Passive management strategies, such as vegetation management (mowing, removing dead vegetation and dense tree stands), removing standing water bodies, installing and maintaining exclusionary fencing, and use of targeted pesticides would reduce the presence of wildlife within the wildlife exclusion zone and reduce the potential risk to wildlife and the flying mission. The listed passive management strategies would be considered during annual flight safety reviews to ensure compliance with DAF directives and instructions. In addition, the REPI program could be used to remove or avoid land use conflicts near installations. The passive management strategies presented in **Section 2.5.1** and defined in **Table 2.5-1** would have a positive effect on airfield operations and management.

Active Controls

The application of active controls presented in **Section 2.5.2** and defined in **Table 2.5-2** would include the use of non-lethal and lethal techniques, as deemed appropriate, to optimize the management of wildlife hazards within the wildlife exclusion zone of a typical DAF airfield environment. The active control measures would be considered during annual flight safety reviews, or as needed, to ensure compliance with DAF directives and instructions. Use of auditory harassment/avian distress calls may induce a temporary hazard since birds may initially react to calls by flying toward and circling before gradually moving away from the source (DAF 2021a). As such, these measures would be best done prior to commencing daily flying activities or during breaks in flight activities (DAF 2020b). Entrapment/relocation and depredation strategies would be active control measures taken to reduce the degree of risk associated with the hazard to an "acceptable degree" and could be a long-term action if completed correctly and diligently.

In summary, implementation of the Proposed Action would ensure compliance with DAF directives and instructions, increase the effectiveness of the BASH management program, and ensure risks to airfield operations within the wildlife exclusion zone is mitigated to the extent practicable at DAF installations nationwide. No significant impact would be anticipated, and the overall impact to airfield operations would be positive.

3.1.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to airfield operations and management beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

3.2 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals and the habitats in which they exist. The **ESA** (16 USC Section 1531 *et seq*.) establishes a federal program to protect and recover imperiled species and the ecosystems upon which they depend. Protected and sensitive biological resources include ESA listed species (threatened or endangered) and those proposed for ESA listing as designated by the

USFWS; state-listed threatened, endangered, or special concern species; migratory birds; and bald and golden eagles. Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the ESA and as sensitive ecological areas designated by state or other federal rulings. They also include wetlands, plant communities that are unusual or limited in distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats). The ESA requires federal agencies, in consultation with the USFWS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species, species proposed for listing, or result in the destruction or adverse modification of designated critical habitat of such species. The ESA also prohibits any action that causes a "take" of any listed species. To "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

The **MBTA** (16 USC 703–712), as amended, and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires federal agencies to minimize or avoid impacts on migratory birds. Unless otherwise permitted by regulations, the MBTA makes it unlawful to (or attempt to) pursue, hunt, take, capture, collect, or attempt to kill any migratory bird, nest, or egg. The MBTA protects all native birds (see 50 CFR 10.13, *List of Migratory Birds*); however, the USFWS can issue depredation permits for the take of migratory birds when certain criteria are met pursuant to the MBTA. Unlike the ESA, the MBTA does not have a formal consultation process. However, the USFWS provides technical assistance upon request. Certain avian species are also designated as **Birds of Conservation Concern (BCC)** by the USFWS as mandated in the 1988 amendment to the Fish and Wildlife Conservation Act (16 USC 49). These species are of the highest conservation priority and are migratory nongame birds that would likely become proposed for listing under the ESA unless additional conservation action is taken.

The **BGEPA** (16 USC 668–668d) affords the bald eagle and golden eagle protection in addition to that provided by the MBTA, in particular, making it unlawful to disturb eagles. The term "disturb" is defined as "*to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior*" (50 CFR 22.6). Harassment of eagles at an airfield that rises to the level of "disturb" is prohibited.

The **Sikes Act** (16 USC 670a–670o, as amended) provides for cooperation among the DoD installations, USFWS, and respective state agencies concerning the conservation, protection, and management of natural resources on military installations throughout the U.S. The primary objective of the DAF natural resources program is to sustain, restore, and modernize natural infrastructure to ensure operational capability and no net loss in the capability of DAF lands to support the military mission of the installation.

The **Marine Mammal Protection Act** (16 U.S.C. 1361) prohibits the "taking" of marine mammals - including harassment, hunting, capturing, collecting, or killing - in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. Airfields located directly along coastlines may need to ensure compliance with the Marine Mammal Protection Act in certain circumstances.

3.2.1 Affected Environment

Wildlife requires three basic habitat components for survival including a food source, water source and shelter (DeVault and Washburn 2013; DeVault et al. 2017). The required type, amount, or level of these three habitat components is species- and location-dependent. Several land uses are commonly known to attract wildlife including wastewater disposal operations, water management facilities, wetlands, dredge spoil containment areas, agricultural activities, aquaculture, and golf courses, among others (FAA 2020). However, virtually any land cover or type will serve as habitat for a species of wildlife at some point in their life cycle (DeVault et al. 2017). Wildlife is particularly attracted to airports for many reasons including minimal human activity; typically undisturbed, open spaces; abundance of food options; water sources in the form of detention ponds and drainages; and shelter options including structures such as building and hangars and intact woodland or trees (Belant and DeVault 2013; DeVault and Washburn 2013; FAA 2005). Depending on the region, ecosystem and/or urban, suburban or rural setting of the region, a variety of habitats can occur within a given airfield. Although the DAF installations discussed in this PEA occur throughout the CONUS (see **Figure 1.1-1**) and cover numerous ecosystems and environmental conditions, common habitat types typically occur at most airports including managed turf and grassland, shrubland and/or woodland, manmade or natural water sources and manmade structures. As nearly 60 percent of BASH collisions with wildlife occur at or below 500 feet AGL (AFCEC 2018), habitat management to reduce wildlife at DAF installations is the most effective action to minimize collisions with aircraft.

The species that occur within these common habitats, and how the habitats are used by these species is discussed in Sections 3.2.1.1 through 3.2.1.4. Although birds are by far the most commonly struck group of wildlife at airports (FAA 2005), mammals and reptiles are also reported as struck at both FAA and military airfields. The species that are commonly struck and/or considered most hazardous (FAA and USDA 2020; Pfeiffer et al. 2018) and how they utilize habitats at airports will also be discussed.

Birds are often grouped into guilds, which is described as a group of birds that may not be taxonomically related (i.e., having a similar biological classification) but occupy similar habitats or behave similarly. Avian guilds will be used to describe species' habitat use below or specific species are discussed in Sections 3.2.1 and 3.2.2, when appropriate. Most of the states with a DAF installation airfield (see **Figure 1.1-1**) have known occurrences of federally and state-listed endangered, threatened, proposed, or BCC species (USFWS 2022a). In addition, birds protected by the MBTA and BGEPA are known to occur within all the states with a DAF installation airfield (National Audubon Society 1994; USFWS 2020). The potential for state- and federally endangered, threatened, proposed, or BCC species or species protected by the BGEPA to occur in or be impacted by military operations at each installation is highly dependent on habitat requirements for listed species, as well as known occurrences of a listed species, and should be evaluated on a case-by-case basis.

3.2.1.1 Managed Turf and Grassland Habitat

Aside from the most arid regions of the U.S., most airports and airfields contain areas of both natural grassland habitat as well as managed turf typically located directly adjacent to runways, taxiways and aprons. Compared to natural grassland at airports, managed turf is typically shorter and consists of homogenous species. The DAF has incorporated a policy that managed turf be cut at a uniform height between 7-14 inches (Washburn and Seamans 2013) and the FAA recommends that the turf not be planted with seed mixtures containing millet or any other large seed producing grass (FAA 1998). Natural

grassland is not typically maintained as often as managed turf and may also contain a variety of natural or invasive grass species. Common avian species that are considered a high risk to aircraft collision that utilize managed turf or native grassland include doves and pigeons (*Columbidae*); egrets (specifically cattle egret [*Bubulcus ibis*]); raptors; blackbirds (*Icteridae*) and starlings (*Sturnus vulgaris*); aerial foragers; and grassland passerines (National Academies of Sciences, Engineering, and Medicine 2013).

Doves and pigeons are some of the most frequently struck species at both civil and military airfields (Colón and Long 2018; FAA and USDA 2020) and commonly forage for seeds in small, loose flocks or large flocks within habitats such as managed turf. Cattle egret are also a commonly struck species at airports (FAA and USDA 2020; Mendonca and Wallace 2021; Pfeiffer et al. 2018) and are especially attracted to freshly mowed grass when insects and other invertebrates are stirred from the grass (National Audubon Society 2022). Predatory raptors such as the red-tailed hawk (*Buteo jamaicensis*) may perch adjacent to grassland habitats where this species may hunt small mammals or rodents (DeVault et al. 2017), whereas scavengers such as vultures (*Carthartidae*) may soar over grassland habitats in search of carrion. Similar to doves and pigeons, blackbirds and starlings forage for insects within grassland habitat. These species often flock in very large numbers and are therefore a high risk for collision with aircraft (FAA and USDA 2020; Pfeiffer et al. 2018; Barras et al. 2003). Aerial foragers such as swallows (*Hirundinidae*) and night hawks (*Chordeiles* spp.) typically feed on insects on the wing, typically over water or open, grassy fields (National Audubon Society 2022). Grassland passerines such as meadowlarks (*Sturnella* spp.) spend most of their time walking and foraging in grassland habitat in search of seeds and insects (National Audubon Society 2022) and in the winter months may forage in medium to large sized flocks (Jaster et al. 2020; Davis and Lanyon 2020). Although killdeer (*Charadrius vociferus*) is considered a shorebird, this species spends the majority of their lives within upland habitats including grassland, pastures and fields, often far from water (National Audubon Society 2022). Killdeer are commonly struck at airports (FAA and USDA 2020), likely due to their flocking behavior (especially in the winter), and their nesting behavior. Killdeer nest on the ground often near edge habitats such as gravel or soil substrate adjacent to grassland (Jackson and Jackson 2020), which is common at most airport environments.

The Canada goose (*Branta canadensis*) is one of the most hazardous species at airports and to military aircraft due to their large size and flocking behavior (FAA and USDA 2020; Pfeiffer et al. 2018). This species is highly adapted to urban and suburban environments and forages and nests within maintained habitats such as golf courses and airports.

In addition to avian species that are common within maintained turf and grasslands at airports, mammals including predators such as coyote (*Canis latrans*), small or medium sized mammals such as skunk (*Mephitidae*), ground hogs (*Marmota monax*), or prairie dogs (*Cynomys*) and rodents such as rats and mice (*Neotominae*) also utilize maintained turf and native grassland habitats at airports (National Academies of Sciences, Engineering, and Medicine 2013; FAA and USDA 2020). Coyotes are typically active during daytime or twilight and may occur in these habitats while hunting for rodents. Small mammals may forage within or use grassland habitats to move back and forth between habitats used for shelter. Managed turf and natural grassland habitat provide a food source and cover for wildlife at airports.

3.2.1.2 Shrubland and Woodland Habitat

The presence of isolated shrubs, trees, or larger expanses of woodland habitat greatly varies on the location of the airfield and is dependent upon the region's climate, physical characteristics, and other environmental factors. Trees and shrubs can provide perching or roosting habitat, nesting habitat, serve as a food source as well as protection and cover for a variety of avian and mammal species. Numerous species of birds utilize both shrubs and trees for perching or roosting (National Academies of Sciences, Engineering, and Medicine 2013) including vultures and other raptors such as red-tailed hawk; passerines such as starlings, blackbirds, and other songbirds; and doves. These species may often roost or perch in large flocks, especially outside of the breeding season. During the nesting season, shrubs can support nests of many small to medium avian species such as passerines and doves and pigeons. In addition to small and medium sized birds, larger trees and stands of woodland can also support nests or larger birds including Corvids such as the American crow (*Corvus brachyrhynchos*) or black-billed magpie (*Pica hudsonia*) or raptors such as bald eagle and hawks (*Buteo* spp.). Shrubs and trees provide a food source for wildlife for both avian and mammalian species with the production of seeds, fruits, nuts and the seedlings or saplings of trees and shrubs. Trees and shrubs planted for landscaping and ornamental purposes often provide fruit, seed and nut food sources and are an attractant for wildlife (DeVault et al. 2017; FAA 2005). Shrubs and trees also provide cover for avian and mammalian species as well as reptilian and amphibian species. Intact, larger expanses of woodland can be especially attractive cover to larger mammals such as white-tailed deer (*Odocoileus virginianus*) and predator mammals (DeVault et al. 2017). In addition, small mammals such as Virginia opossum (*Didelphis virginiana*), porcupine (*Erethizon dorsatum*), black-tailed jackrabbit (*Lepus californicus*) and northern raccoon (*Procyon lotor*) often use tall trees or shrubs for protection or to rest (Reid 2006). Shrubland and woodland habitat provides a place for roosting, nesting, food source and cover for wildlife at airports.

3.2.1.3 Water Habitat

Although water habitats and how they serve as attractants for wildlife and how wildlife interact with them will be discussed in detail in **Section 3.3**, ***Water Resources*** a brief summary is provided here. Water habitats including wetlands, ponds, streams and rivers, detention ponds and stormwater drainage systems that can hold water on both temporary and permanent basis support species such as great blue heron (*Ardea herodias*), shorebirds such as American avocet (*Recurvirostra americana*), and waterfowl such as mallard (*Anas platyrhynchos*) that may use water sources for all phases of life including breeding, foraging and roosting. Some of the most hazardous species for military aircraft, according to Pfeiffer et. al (2018), includes species from these guilds including snow goose (*Anser caerulescens* [damage rank of 1]), Canada goose [damage rank of 4], mallard [damage rank of 6], great blue heron [damage rank of 15], and cattle egret [damage rank of 18], occur in water habitats.

Other species groups including raptors, passerines and others, use water habitat on a more temporary basis for hunting or for basic water needs. For example, bald eagles often construct their nests within mature trees along openings/edges close to waterbodies for foraging and hunting opportunities (Buehler 2022). Some mammal species may use water habitat for basic water needs, as well as hunting or foraging opportunities. Reptiles, including aquatic turtles (*Chelydridae Kinosternidae, Emydidae* or *Trionychidae*) and some amphibians such as frogs (*Ranidae*) spend the majority of their life within temporary and/or permanent water sources. Water habitats provide a roosting, nesting and foraging location for wildlife at

airports. Therefore, implementing both passive management and active controls to reduce wildlife at water resources is vital to reduce risks to airfield operations.

3.2.1.4 Structures

For purposes of this assessment, structures at airports include manmade facilities such as hangars, buildings, posts, fences, equipment including signage, poles and radars, and even paved surfaces such as taxiways and runways. Structures and equipment provide nesting locations for several avian species including aerial insectivores, doves and pigeons, raptors, and blackbirds and starlings, among others (FAA 2005; DeVault and Washburn 2013; National Academies of Sciences, Engineering, and Medicine 2013). Fences, poles, radars and other equipment provide roosting locations for avian species such as doves and pigeons, raptors, and blackbirds and starlings, among others. Similarly, small mammals such as skunk and rodents may use structures for nesting locations or cover. Although reptiles are not struck nearly as often or cause as much damage as avian species and mammals to aircraft, strikes with reptilian species at airfields have also been reported (FAA 2005; FAA and USDA 2020; National Academies of Sciences, Engineering, and Medicine 2013). Reptiles such as turtles (*Testudines*), snakes (*Serpentes*), and the American alligator (*Alligator mississippiensis*) may bask on the asphalt of warm runways and taxiways at airports to aid in regulating body temperature. Structures and facilities at airports are also considered a habitat that may provide a roosting, cover, and nesting location for wildlife at airports.

3.2.2 Environmental Consequences

Potential impacts to biological resources including flora and fauna, and specifically those species federally protected by the ESA, MBTA, and BGEPA and state regulations, need to be carefully evaluated and considered when implementing both passive management measures and active controls for wildlife at airfields. Whenever possible, land uses that are commonly known to attract wildlife (FAA 2020) should be avoided or minimized within and outside of the airfields. However, nearly all types of habitats can attract wildlife. Evaluating wildlife issues and habitats specific to an installation and individualizing a wildlife plan is essential in reducing strikes. In addition, understanding what federally or state-protected species have potential to occur at an individual airfield will guide decisions on the type of management actions that should be taken and what regulations need to be followed. Although not all the airfields covered in this PEA are known to support federally or state-protected species, installations would follow all applicable laws and regulations regarding wildlife and would initiate consultation with the appropriate agencies when necessary. If BASH procedures as part of the Proposed Action are planned and implemented as described in **Section 2.5**, biological resources would likely not be adversely impacted. In many instances, implementation of the Proposed Action would be beneficial and minimize or even avoid impacts to biological resources. The installation-level natural resources manager would be included in the environmental project planning review process for proposed BASH management strategies. Each installation would evaluate implementation of the proposed BASH management strategies on a case-by-case basis, depending on the potential presence of protected species and habitats specific to the airfield.

3.2.2.1 Proposed Action

Passive Management

As presented in **Section 2.5.1** and defined in **Table 2.5-1**, passive management strategies that would have the potential to impact biological resources include habitat modification measures such as managing turf and maintaining vegetation to reduce food options, perching, cover, and nesting habitat. Passive management may also include incorporating anti-perching and nesting devices; constructing and maintaining a perimeter fence; managing water resources to reduce attractiveness to wildlife; implementation of visual deterrents; implementation of non-lethal chemical repellents; and incorporating policies such as removing carcasses, managing crops and covering garbage and waste receptacles. Passive management measures are typically harmless to biological resources and may be beneficial as they would minimize collisions with aircraft. However, the use of herbicides and pesticides may impact beneficial pollinator species or state- or federally protected species such as the rusty patched bumble bee (*Bombus affinis*) which is federally listed as endangered or the monarch butterfly *(Danaus plexippus*) which is proposed for such listing. Impacts to these species would have more of an environmental consequence than impacts to nuisance or abundant invertebrate species. See **Section 3.5**, ***Hazardous Materials and Wastes*** for a discussion on the application and disposal of pesticides on DAF installations in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a).

Habitat modification measures can be some of the most effective wildlife management measures at airfields and can include managing turf and other vegetation as well as managing or maintaining water resources (see **Section 3.3, *Water Resources***). Managing turf includes maintaining the height of grass to DAF standards, incorporating certain grass species, establishing a monoculture of species, reseeding bare areas and applying herbicides and pesticides. Other vegetation management measures can include the removal of dead vegetation, shrubs and trees; trimming of branches; and the removal of vegetation that produces flowers, fruits and seeds. These measures would reduce or remove food sources, as well as roosting and nesting habitat. Turf management is generally harmless to wildlife and would deter species such as Canada goose and meadowlarks from foraging in flocks and small mammals from using these habitats for cover or food (Washburn and Seamans 2013). Airfields should ensure that species protected by state and federal laws are not impacted by removal of vegetation or trimming or maintaining of shrubs and trees. For example, unless an airfield has obtained a migratory bird depredation permit, an airfield should ensure no active nests are present in shrubs or trees before trimming branches, or nests constructed by ground nesting species are not present on the ground prior to mowing.

Installing anti-perching and nesting devices and removing obsolete structures and poles is a management technique that is also generally a non-lethal method of wildlife control. Installing netting, spike strips, pole caps or effigies can deter wildlife from utilizing a habitat and visual deterrents such as flagging may be effective dependent upon the target species (Blackwell and Fernandez-Juricic 2013). The installation of a perimeter fence, specifically a fence that follows the FAA or DAF standards, is the most effective management measure for reducing or eliminating mammals such as coyotes and deer (DAF 2021a; FAA 2005, 2016; VerCauteren et al. 2013). If constructed to FAA standards including the installation of a skirt and reduction of gaps, perimeter fences may also minimize small mammals, such as skunks and raccoons, from digging under the fence or squeezing through small fence gaps (FAA 2016).

Non-lethal chemical repellant application can elicit a negative reaction or experience for wildlife and can deter certain species from using habitats on airfields. Chemical repellents can either have a quality that causes a species to withdraw or may cause an illness or other physiological reaction that cause the animal to avoid the treated area or habitat (Clark and Avery 2013). The goal with these types of repellants is to displace the animal from an undesirable or unsafe habitat at airfields (Clark and Avery 2013; FAA 2005). Chemical repellents may be effective on flocking birds such as barn swallows (*Hirundo rustica*) feeding on insects, roosting flocks of vultures in trees or on grass where ground-foraging birds may occur. Certain chemicals have also been successful in deterring mammals such as deer and rabbit (Clark and Avery 2013). Use of the chemicals should always be registered with the EPA and follow application guidelines outlined by the EPA and other regulatory agencies (see **Section 3.5**, ***Hazardous Materials and Wastes***).

Implementing protocols and policies for airfield staff, pilots, managers and other airfield users regarding wildlife control is important to passive management. Ensuring that carcasses are removed from the airfield eliminates potential food sources for scavenger species. Certain seed and feed crops are an attractant for birds such as blackbirds, doves, and starlings while cattle may attract egrets, cowbirds, and blackbirds (FAA 2005; DeVault et al. 2017). Ensuring that incompatible land uses such as agriculture or cattle production or landfills, are not permitted within or surrounding the airfield, when possible, reduces the attractiveness of the airfield environment to species (see **Section 3.9**, ***Land Use*** for programs, including REPI, that have been developed to promote compatible land uses next to military installations). Ensuring that garbage bins and waste receptacles are closed and maintained properly, and that all waste is properly disposed of or removed would eliminate food sources for scavenger birds and small mammals. Implementing protocols and polices regarding wildlife is an effective management measure without directly adversely impacting biological resources.

Active Controls

As presented in **Section 2.5.2** and defined in **Table 2.5-2**, active controls that would have the potential to impact biological resources have been categorized into three control strategies: harassment, entrapment/relocation and depredation. Harassment measures typically have the smallest impact to biological resources with depredation having the greatest impact.

Harassment measures may include auditory methods such as implementing pyrotechnics, air horns, vehicle horns, air or propane cannons or recorded avian or mammal distress calls. Harassment measures are considered short-term solutions (DeVault et al. 2017; Washburn et al. 2006) with short-term impacts to wildlife but can be very effective in flushing flocks of birds. Use of radio-controlled vehicles, ATVs, and airfield vehicles can also be used to flush birds on a temporary basis (FAA 2005), and would similarly have short-term, minor impacts to wildlife. Other harassment measures such as use of paintballs and lasers would also have a temporary, short-term result and impact to wildlife. The purpose of harassment measures is to cause temporary pain or fear to wildlife (FAA 2005). Incorporating birds of prey or canines to flush birds from airfields may temporarily disturb species and has been known to be effective for flushing flocks of birds such as cattle egret (FAA 2005; National Academies of Sciences, Engineering and Medicine 2013). Harassment of federally endangered or threatened species protected under the ESA is prohibited. Harassment of eagles to the level of "disturb" as defined by 50 CFR 22.6 (described in **Section 3.2**) is also prohibited. However, harassment of other species of wildlife, including birds protected by the MBTA, does not require a permit (USFWS 2022b). Installation-level natural resources managers should coordinate with the USFWS MBTA permit office if a known eagle nest site,

roost site or important foraging area is located adjacent to the airfield before implementing harassment measures (USFWS 2022c).

Entrapment or relocation methods may include both chemical immobilization and non-lethal trapping for relocation. Certain chemicals are registered with the Food and Drug Administration for use in immobilizing and capturing avian species such as waterfowl, coots, and pigeons (FAA 2005). Chemical tranquilizers may be used to immobilize large mammals such as deer or coyotes while non-lethal trapping may be more effective for medium mammals such as northern raccoon. Leg-hold traps are an effective non-lethal trapping method for feral hogs (*Sus scrofa*) (FAA 2005; National Academies of Sciences, Engineering, and Medicine 2013). This method is also an alternative to lethally removing wildlife from airfields, but is more intrusive and may have adverse, secondary effects such as introduction of wildlife diseases to relocation sites (DeVault et al. 2017), or the death of the animal due to stress (Washington Department of Fish and Wildlife 2005).

Depredation measures such as lethal chemical application, lethal trapping, nest removal, egg destruction, and shooting of wildlife should be well documented prior to implementation; lethally removing an animal should be carried out following all necessary regulations and policies (FAA 2005). Chemicals can be used to both lethally remove the target species or remove the target species' food source (National Academies of Sciences, Engineering, and Medicine 2013).

A permit from the USFWS may not be required for certain species and situations. The following Standing Depredation and Control Orders have applicability near airports in the CONUS:

- 50 CFR 21.150 – Depredation Order for Blackbirds, Cowbirds, Crows, Grackles, and Magpies
- 50 CFR 21.159 – Control Order for Resident Canada Geese at Airports and Military Airfields
- 50 CFR 21.162 – Depredation Order for Resident Canada Geese Nests and Eggs
- 50 CFR 21.174 – Control Order for Muscovy Ducks in the United States.

The parameters of these standing depredation and control measures must be carefully followed. The regulations are species- and situation-specific and include clearly defined protocols, restrictions and in some cases, reporting requirements. Removing most active avian nests, such as swallow nests under bridges and inside buildings or raptor nests within trees, requires a migratory bird depredation permit from the USFWS. Each permit approved by the USFWS includes specific procedures, processes, and reporting requirements that must be followed.

Removal and relocation of active nests of ESA listed species is prohibited. When removal and relocation of an eagle nest is necessary to ensure public health and safety, a 50 CFR 22.85 permit must be obtained. This permit does not allow intentional, lethal take of eagles. For other migratory bird species, a depredation permit must be obtained that allows egg removal or destruction including oiling, shaking, puncturing of eggs (National Academies of Sciences, Engineering, and Medicine 2013; Dolbeer and Cleary 2005). In addition, if active BCC nests are removed, separate reporting under airport-specific depredation permits is typically required. Under a depredation permit, the USFWS would like to be contacted for technical assistance if BCC are being taken at an airfield. There are generally two methods in lethally shooting a bird from an airfield: removing target species quietly to remove the maximum number of birds for species such as pigeons, or during the day in front of other birds to discourage use of the airfield of observing birds for species such as geese or gulls (FAA 2005). For certain mammals such as deer, shooting is the most effective method to remove the animal (National Academies of Sciences,

Engineering, and Medicine 2013). Depredation measures have permanent and much greater impacts to biological resources when compared to the other passive management and active control measures but should not noticeably affect a species population since take is controlled and monitored by the USFWS or state wildlife agencies.

In summary, the implementation of passive management measures, as described in **Section 2.5.1**, would have less of an impact to biological resources than most active measures. Similarly, the implementation of certain active controls, as described in **Section 2.5.2** such as harassment protocols would also have an insignificant impact to biological resources. Wildlife can become habituated to these measures and diligence in changing procedures, locations and types of these management measures may improve efficacy. Utilizing non-lethal chemical repellants would have much less impact to biological resources than incorporating lethal measures. More aggressive active control measures, such as entrapment or relocation protocols and depredation measures, would have a greater impact to biological resources. The installation-level natural resources manager would be included in the environmental project planning review process for proposed BASH management strategies. Each installation would evaluate implementation of the proposed BASH management strategies on a case-by-case basis and consult with USFWS under Section 7 if any listed species, species proposed for listing, or if designated critical habitat of such species would be destroyed or adversely modified. No significant impact to biological resources at a population level would be anticipated provided BASH procedures are planned and implemented as described in **Section 2.5**.

3.2.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to biological resources beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

3.3 WATER RESOURCES

Water resources for this PEA include the quantity and quality of surface water bodies, wetlands, floodplains, and the coastal zone.

Surface water includes all rivers, streams, lakes, and ponds that are used for various applications including recreation, sustenance, irrigation, flood control, and human health. Surface waters in the U.S. are protected under the CWA (33 USC 1251 *et seq.*), the goal of which is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

Groundwater exists under the earth's surface within cracks of fractured rock and soil in saturated zones beneath the surface of the land and is stored in and moves through aquifers. Groundwater is important for both humans and wildlife. Approximately 40 percent of water used for public supplies and about 39 percent of water used for agriculture in the U.S. is sourced from groundwater (USGS 2022). Groundwater is stored in both confined and unconfined aquifers and can flow to the surface in the form of springs.

Wetlands improve water quality, assist in groundwater recharge, provide natural flood control, assist in trapping sediment, and may also support a wide variety of fish, wildlife, and plants. Wetlands are considered sensitive habitats and are subject to federal regulatory authority under Sections 401 and 404 of the CWA and EO 11990, *Protection of Wetlands*. EO 11990 requires federal agencies adopt a policy to

avoid, to the extent possible, long- and short-term adverse impacts associated with destruction and modification of wetlands. Wetlands are defined by the USACE 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 (Environmental Laboratory 1987). Wetlands generally include swamps, marshes, bogs, and similar areas.

Floodplains are defined by EO 11988, *Floodplain Management*, as "the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year." Areas subject to a 1 percent or greater chance of annual flooding are also referred to as 100-year floodplains and areas subject to a 0.2 percent or greater chance of annual flooding are referred to as 500-year floodplains (EPA 2022a). To minimize the risk of damage associated with these areas, EO 11988 requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. In addition, EO 14030, *Climate-Related Financial Risk*, which reinstated the previously rescinded EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, established a federal flood risk management standard as well as a process for soliciting and considering stakeholder input regarding impacts to floodplains. Under EO 14030, federal actions impacting floodplains require solicitation of comments from the public. In addition, EO 14030 implements a more stringent definition of a floodplain.

As defined by the Coastal Zone Management Act of 1972 (16 USC 1451–1465), the ***coastal zone*** includes "coastal waters extending to the outer limit of state submerged land title and ownership, adjacent shorelines, and land extending inward to the extent necessary to control shorelines". Federal actions that are likely to affect any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of that state's Coastal Zone Management Plan which is authorized to administer the Coastal Zone Management Act (16 USC 1451–1465). As a federal agency, the DAF is required to determine whether its proposed activities would affect the coastal zone. At the installation-level, this takes the form of a consistency determination, a negative determination, or a determination that no further action is necessary.

3.3.1 Affected Environment

The temporal and spatial extent of water resources at airfields greatly varies on the location of the airfield and is dependent upon the region's climate, physical characteristics, and level of human disturbance. Within some of the driest level III ecoregions in the southwestern states of the CONUS, the mean precipitation can average 7 or 8 inches within the Mojave Basin and Range and Sonoran Basin and Range ecoregions, respectively (EPA 2013; Wilken et al. 2011). Conversely, some of the wettest level III ecoregions along the eastern CONUS can have a mean precipitation of 48 or 53 inches within the Middle Atlantic Coastal Plain and Southern Coastal Plains, respectively (EPA 2013; Wilken et al. 2011). Airfields within drier climates or in wetter regions during a drought may support temporary water sources or may be primarily dry while airfields in wetter climates or in areas experiencing flooding may support perennial streams, large wetlands or other large, permanent sources of surface water.

Many wildlife species depend on habitats sourced from groundwater and the species that depend on these habitats are often considered rare, unique or threatened species. Groundwater dependent ecosystems include springs, seeps, caves, and karst habitats which can support a variety of plants and wildlife. The most common type of wetlands at airfields includes freshwater emergent wetlands which primarily contain herbaceous vegetation. In some instances, freshwater forested and shrub wetlands containing tree and shrub vegetation, or estuarine or marine wetlands located adjacent to brackish or saltwater habitat within coastal environments may occur (USFWS 2019). Floodplains are the relatively low or flat areas that are subject to flooding and likely flood after heavy precipitation events. The Federal Emergency Management Agency issues flood insurance rate maps for areas outside of DoD land. A flood insurance rate map is an official map of a community within the U.S. that displays the floodplains, more explicitly special hazard areas and risk premium zones. DAF airfields are oftentimes located within floodplain areas. Many DAF installations generate their own floodplain maps based on remote sensing data or other enhanced floodplain mapping methods. Coastal zones are a regulatory boundary that typically include coastal waters and adjacent shorelines. DAF installations in CONUS coastal states are likely subject to the requirements of the Coastal Zone Management Act.

3.3.2 Environmental Consequences

Determination of significance of potential impacts to water resources would depend on the nature of the water resource, its importance to the ecosystem, and the ability of the system to function if that resource were altered or removed completely. Each installation would evaluate implementation of the proposed BASH management strategies on a case-by-case basis and consult with the USACE if altering or impacting WOTUS. Impacts to water quality would be considered significant if the changes result in violation of established laws or regulations related to water quality protection. Impacts to water resources at airfields, including surface water, wetlands, floodplains, and the coastal zone can occur when implementing both passive management and active control measures presented under the Proposed Action. Many water resources are considered WOTUS and jurisdictional under the CWA and certain actions or impacts to WOTUS would require permitting from the USACE, EPA or state water agency. Under certain circumstances, impacts would also require mitigation. Installation-level management personnel (e.g., civil engineering) would be included in the environmental project planning review process for proposed BASH management strategies.

> WOTUS are generally defined as "all waters subject to the ebb and flow of the tide including interstate wetlands and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds and their tributaries (EPA 2022b).

The current definition of WOTUS is consistent with the pre-2015 regulatory definition (EPA 2022b). Careful consideration in determining if a water resource is categorized as a WOTUS is imperative in determining the level of impact a passive management or active control measure would have on the resource. Additionally, some wetlands may be considered federally non-jurisdictional WOTUS, but may be regulated by state programs and require permitting and mitigation. Potential impacts to wetlands would need to be mitigated for under EO 11990, *Protection of Wetlands*.

3.3.2.1 Proposed Action

Passive Management

As presented in **Section 2.5.1** and defined in **Table 2.5-1**, passive management strategies that would have the potential to impact water resources include regrading or filling low surface points that retain water; managing vegetation within surface water; removing, draining or filling standing water; installing physical barriers within waterbodies; installing aeration pumps or agitation equipment within waterbodies, and pesticide application. Certain management measures would generally have an insignificant impact to water resources such as installation of certain physical barriers, managing vegetation, or targeted ground-based application of pesticides; however, other passive management measures such as aerial application of pesticides or filling or draining water resources could have a significant impact to water resources and would require substantial permitting through state and federal agencies. Consultation with USACE under Section 404 of the CWA, if required, would be site-specific and accomplished at the installation-level.

Regrading or filling low surfaces that retain fresh water for more than 48 hours is a very effective management measure to reduce wildlife use at that habitat. Certain water features such as canals, ditches, swales or stormwater management facilities may or may not be considered WOTUS. The FAA provides guidance regarding the manipulation of existing or designing new surface storm drainage systems which can assist in reduction of attractiveness of some manmade surface water resources (FAA 2013; 2020). However, many other surface water resources may be considered WOTUS and the filling, manipulating or removing of such features could lead to a significant impact to the resource.

Managing vegetation within and adjacent to water resources such as canals, ditches, streams or ponds is a relatively low impact measure to reduce cover and food sources for certain avian and mammal species. Vegetation within water resources can also provide nesting habitat for certain wildlife species (FAA 2005, 2020). The removal of vegetation surrounding ponds, streams and within wetlands could impact the function of the wetland as vegetation serves as an important component for flood protection, water quality improvement, and erosion control. The impact of removing vegetation within a non-WOTUS would need to be evaluated from a compliance and habitat perspective. If this measure would impact the function of or would incorporate fill into a WOTUS, or if the WOTUS supports habitat for a federally protected species, the potential impacts would be more adverse.

When water resources cannot be regraded, filled or drained, another management measure could be to cover the feature with bird balls, wire grids, pillows, netting, or other physical barriers to prevent use by wildlife (FAA 2005, 2020; DeVault et al. 2017). Installing other deterrent measures such as aeration pumps, agitation equipment or fountains may also deter wildlife from using a water resource and impacts would be minimal; however, these measures may cause water quality issues if not monitored or installed correctly (DeVault et al. 2017).

Pesticides would be applied in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a). The pesticides considered for use would be EPA-approved, follow EPA guidelines, used in accordance with the pesticide label, and would be applied by/or observed only by state-certified personnel authorized to apply pesticides on CONUS DAF installations. Pesticide usage would be installation-specific and dependent on the type of species present within the installation environment. For aerial application of pesticides, installations would need to ensure that state or EPA CWA National Pollutant Discharge Elimination

System pesticide permits to support aerial application of pesticides would be completed prior to the activity (DAF 2019a). See **Section 3.5**, ***Hazardous Materials and Wastes*** for the discussion of pesticide usage under the Proposed Action.

Active Controls

As presented in **Section 2.5.2** and defined in **Table 2.5-2**, active controls including harassment measures, entrapment/relocation and depredation controls can be applied to or focused adjacent to water resources. Harassment measures, especially pyrotechnics, can be particularly effective adjacent to water resources that attract wildlife. Entrapment and relocation methods can be placed adjacent to water resources where flocks of birds or small mammals frequent. Depredation measures such as nest and egg removal might be appropriate if breeding waterfowl, shorebirds or other avian nests are observed nesting adjacent to water sources. In addition, if reptiles and amphibians such as lizards and frogs serve as a prey base for larger species such as great egret (*Ardea alba*) or great blue heron, focused depredation measures could be implemented for prey species. Active controls are unlikely to have an impact to water resources as the measures are not being applied to or influencing change to any type of water resource.

In summary, installation-level management personnel would be included in the environmental project planning review process for proposed BASH management strategies. The implementation of some passive management measures has the potential to impact water resources and would require evaluation on a case-by-case basis. The level of impact would depend on the method used and whether the resource is considered a WOTUS and protected under the CWA or if the water resource supports a protected species or species of concern. Passive management measures such as regrading, filling or draining of WOTUS has the potential for significant impact whereas other passive management measures, such as installing physical barriers or targeted ground-based application of pesticides, likely has an insignificant impact. Aerial application of pesticides may also have a significant impact if the action degrades water quality to the extent that it harms wildlife. If impacts to WOTUS would occur as a result of a BASH management measure, complex permitting, and mitigation would be required through both state and federal agencies. In addition, impacts to non-jurisdictional wetlands would need to be mitigated for under EO 11990, *Protection of Wetlands*. As discussed, active controls (i.e., harassment measures, entrapment/relocation and depredation controls) would have a small or insignificant impact to water resources.

3.3.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to water resources beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

3.4 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic buildings, districts, sites, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can be divided into three major categories: archaeological resources (prehistoric and historic), architectural resources, and traditional cultural resources.

Archaeological resources are locations where human activity measurably altered the earth or left deposits of physical remains (e.g., tools, arrowheads, or bottles). "Prehistoric" refers to resources that predate the advent of written records in a region. These resources can range from a scatter composed of a few artifacts to village sites and rock art. "Historic" refers to resources that postdate the advent of written records in a region. Historic resources can include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features.

Architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered for protection under existing cultural resources laws. However, more recent buildings and structures, such as Cold War-era military buildings, may warrant protection if they have exceptional characteristics and the potential to be historically significant, or if they are integral parts of a district that is eligible. These properties are evaluated under National Register of Historic Places (NRHP) Criteria Consideration G, which includes properties that have achieved significance within the past 50 years. Architectural resources must also possess integrity (i.e., important historic features must be present and recognizable in order to convey its significance).

Traditional cultural resources are resources associated with the cultural practices and beliefs of a living community that link that community to its past and help maintain its cultural identity. Traditional cultural resources may include archaeological resources, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the continuance of traditional cultures. Traditional cultural resources are identified by Native American tribes through consultation.

Only cultural resources considered to be significant, known or unknown, warrant consideration with regards to adverse impacts resulting from a proposed action. To be considered significant, archaeological or architectural resources must meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the NRHP. The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
b. that are associated with the lives of persons significant in our past; or
c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
d. that have yielded, or may be likely to yield, information important in prehistory or history.

Several federal laws and regulations have been established to manage cultural resources, including the NHPA (54 USC 300101 *et seq*.), the Archaeological and Historic Preservation Act (6 USC 469-469c), the American Indian Religious Freedom Act (42 USC 1996), the Archaeological Resources Protection Act (6 USC 470aa-470mm), and the Native American Graves Protection and Repatriation Act (25 USC 3001-3013).

On November 27, 1999, the DoD promulgated its Annotated American Indian and Alaska Native Policy, which emphasizes the importance of respecting and consulting with Tribal governments on a government-to-government basis. This Policy (known as the DoD American Indian/Alaska Native Policy), as well as

DoDI 4710.02, *Interactions with Federally Recognized Tribes* (DoD 2018b), requires an assessment, through consultation, of the effect of proposed DoD actions that may have the potential to significantly affect protected Tribal resources, Tribal rights, and Indian lands before decisions are made by the respective services.

Under Section 106 of the NHPA, federal agencies must consider the effect of their undertakings on historic properties, consult with the SHPO and other consulting parties, and allow the Advisory Council on Historic Preservation a reasonable opportunity to comment. This federal agency evaluates the NRHP eligibility of resources within the proposed undertaking's area of potential effects and assesses the possible effects of the proposed undertaking on historic properties in consultation with the SHPO and other parties. The area of potential effects is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."

3.4.1 Affected Environment

The area of potential effects for cultural resources would include those areas subject to ground disturbing activities (physical) and/or changes in the visual, audible, and atmospheric setting (non-physical) for implementation of BASH management strategies within a respective installation's wildlife exclusion zone.

3.4.2 Environmental Consequences

Analysis of potential impacts on cultural resources considers both direct and indirect effects. Direct effects may occur by: (1) physically altering, damaging, or destroying all or part of a resource; (2) altering characteristics of the surrounding environment that contribute to the resource's significance; (3) introducing visual, audible, or atmospheric elements that are out of character with the property or which alter the property's setting that contribute to its historic significance; (4) neglecting the resource to the extent that it deteriorates or is destroyed; or (5) selling, transferring, or leasing the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance [36 CFR 800.5(a)(2)]. Direct effects can be assessed by identifying the type of BASH method to be used in relation to the location of cultural resources within the wildlife exclusion zone that could be affected. Direct impacts from implementation of ground disturbing activities that could disturb, damage, or destroy cultural resources can be quantified. Indirect impacts primarily result from the effects that are farther removed from the immediate area including visual, audible (noise), or atmospheric changes due to implementation of the activity; indirect impacts are often more difficult to quantify.

3.4.2.1 Proposed Action

Passive Management

As presented in **Section 2.5.1** and defined in **Table 2.5-1**, passive management strategies that would have the potential to impact cultural resources at the installation-level and may require consultation with Native American tribes and with the state SHPO per 36 CFR 800.3(a), may include ground disturbance activities such as demolition/removal of obsolete structures and/or installation of poles and digging/excavation for the construction of chain link fencing. Consultation under the NHPA, if required, would be site-specific and accomplished at the installation-level. The installation-level cultural resources manager would be

included in the environmental project planning review process for proposed BASH management strategies to ensure the installation's specific cultural resources would be managed in compliance with the NHPA.

In the event that unknown cultural resources are discovered during any demolition or construction activity, the activity would cease, the installation commander and cultural resources manager would be notified, and SOPs for unanticipated discoveries and notification, as defined in the installation-specific Integrated Cultural Resources Management Plan or Programmatic Agreement, would be implemented (DAF 2020a).

Active Controls

Active controls presented in **Section 2.5.2** and defined in **Table 2.5-2** that would have the potential to impact cultural resources at an installation-level include the use of ATVs; their use may require consultation with Native American tribes and with the state SHPO per 36 CFR 800.3(a). As with passive management measures, the installation-level cultural resources manager would be included in the environmental project planning review process for proposed BASH management strategies to ensure the installation's specific cultural resources would be managed in compliance with the NHPA. In addition, DAF SOPs for discovery and notification of unknown cultural resources would be implemented.

In summary, each installation would be required (as applicable) to initiate consultation with Native American tribes and with the state SHPO per Section 106 of the NHPA, as amended, and as implemented by 36 CFR 800.3(a) informing them of a planned BASH management strategy that has the potential to impact known cultural resources or for discovery of unknown cultural resources during implementation of a BASH management strategy within the wildlife exclusion zone. The DAF would pursue ways to avoid, minimize, or mitigate those effects through Section 106 consultation. Through this process, no significant impact to cultural resources would be anticipated.

3.4.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Significant impacts to cultural resources beyond those experience from existing and ongoing BASH management strategies and SOPs are unlikely to occur. Baseline conditions would continue and would be installation-specific.

3.5 HAZARDOUS MATERIALS AND WASTES

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR 173. Hazardous materials are regulated under the Comprehensive Environmental Response, Compensation and Liability Act (42 USC 9601 *et seq*.); the Occupational Safety and Health Act (29 USC 651 *et seq*.); and the Emergency Planning and Community Right-to-Know Act (42 USC 11001 *et seq*.).

Hazardous wastes are defined as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed (42 USC 6903(5))."

Structures that contain asbestos-containing material and/or lead-based paint present special hazards to the environment and their disposal must be properly managed. The EPA has established regulations regarding asbestos abatement and worker safety under 40 CFR 763. Whether from lead abatement or other activities, depending on the quantity or concentration, the disposal of lead-based paint waste is regulated by the Resource Conservation and Recovery Act (42 USC 6901 *et seq*.). Per- and polyfluoroakyl substances (PFAS) are a class of persistent synthetic chemicals used in many products including paints and firefighting foam. The EPA has not established any maximum contaminant levels for PFAS, but exposure to PFAS could lead to adverse health effects.

Potentially contaminated sites under the DAF's Environmental Restoration Program (ERP) are also typically addressed under hazardous materials and wastes management programs. The ERP is the process by which contaminated sites and facilities are identified and characterized, and by which existing contamination is contained, removed, and disposed of to allow for beneficial reuse of the property. ERP sites include landfills, underground waste fuel storage areas (e.g., oil/water separators), and maintenance-generated wastes. Compliance activities for ERP sites address underground storage tanks, hazardous materials management, closure of active sites, polychlorinated biphenyls, water discharges, and other compliance projects that occur on or near ERP sites.

Pesticides are a group of hazardous materials that while in use are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 *et seq*.) and when disposed are regulated under the Resource Conservation and Recovery Act. Pesticides include herbicides, rodenticides, avicides, and insecticides.

- *Herbicides* are an effective vegetation management tool if the proper active ingredients and formulations are used, applied at the right time, and in the appropriate manner. There are many different classes of herbicides (selective, non-selective, pre-emergence, and post-emergence). A selective herbicide kills specific types of vegetation. Non-selective herbicides kill most vegetation with which they come into contact. Pre-emergence herbicides prevent sprouted seeds from growing, but don't kill established vegetation. Post-emergence herbicides are effective in controlling existing vegetation.
- *Rodenticides* are directly toxic to the mammals that ingest them and are used to kill rodents (i.e., beavers, chipmunks, mice, nutria, porcupines, squirrels, voles, and woodchucks). Rodenticides can be applied using bait boxes, bait stations, target dropped from aircraft, fumigation, or poison bait placed directly down active burrows.
- *Avicides/avian control substances* are used to reduce or repel hazardous bird populations. There are several classes of avicides: baits, repellents, and reproductive inhibitors. Avicides/avian control substances can be applied as chemically treated grain bait and/or brushed or sprayed onto perch surfaces.
- *Insecticides* are substances used to kill insects. Insecticides can be classified into two major groups: systemic insecticides, which have residual or long-term activity, and contact insecticides, which have no residual activity. Herbicides and insecticides can be applied by aerial spraying via helicopter or fixed-wing aircraft or by ground-based methods using a backpack hand sprayer or truck.

3.5.1 Affected Environment

The use and storage of hazardous materials and the management and disposal of hazardous waste is tracked and recorded in accordance with established DAF policies and procedures per AFMAN 32-7002,

Environmental Compliance and Pollution Prevention (DAF 2020c). AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a) provides guidance to individuals at all levels who execute the pest management programs at DAF installations. The installation's designated pest management coordinator is required to ensure pest management programs comply with all applicable federal, state, and local laws, DoDIs, and DAF requirements for procurement and management of hazardous materials per DAFI 23-101, *Material Management* (DAF 2022a).

3.5.2 Environmental Consequences

The hazardous materials and wastes analysis considers potential impacts related to the Proposed Action. Impacts would be considered adverse if an increase in the quantity or toxicity of hazardous materials used or hazardous waste generated substantially increase the risk to human health, non-targeted species, or the environment. Installation-level management personnel would be included in the environmental project planning review process for proposed BASH management strategies.

3.5.2.1 Proposed Action

Passive Management

***Structure removal*:** obsolete and unused buildings, poles, and other structures located within the wildlife exclusion zone that provide a perching site or cover for wildlife would be removed. Prior to removal, all structures would be inspected to identify PFAS, asbestos, and lead to reduce potential hazards to persons and the environment. In the event that PFAS, asbestos-containing materials, or lead-based paint would be encountered during demolition of the obsolete structures, the debris would be properly handled and disposed of by a certified contractor according to all applicable DAF, local, state, and federal rules and regulations in accordance with AFMAN 32-7002, *Environmental Compliance and Pollution Prevention* (DAF 2020c). The DAF maintains a central ERP information system that includes the location and identification of all open and closed ERP sites (DAF 2021b). Before any ground disturbing activity would be implemented, installations would identify the location of the ERP site(s) proximate to the activity and follow established DAF procedures. If implementation of a BASH management activity would occur near an ERP site, no adverse impacts would be anticipated provided procedural guidelines developed by the site-specific installation ERP manager in conjunction with base civil engineers and the EPA were followed to ensure the ERP site integrity was maintained.

Pesticides: as presented in **Section 2.5.1** and defined in **Table 2.5-1**, pesticides (i.e., herbicides, rodenticides, avicides, and insecticides) would be used to control weeds, insects, invertebrates, and rodents; the use would be species targeted. Herbicides would be used to control weeds and invasive plant species. If weeds were permitted to grow, the varied growth sizes and shapes could provide ground cover for birds and the untreated weeds could produce seeds or berries that could provide a food source for birds and small mammals. Rodenticides would be applied to control above ground and burrowing rodents. Avian control substances would be applied to roosting or perching surfaces as a repellant. Insecticides would be used to control insects and invertebrates. Invertebrates include many nuisance pests such as flies, roaches, grasshoppers, and beetles; however, non-target species, including beneficial pollinators such as butterflies and bees could be adversely affected.

Pesticides may be applied by aerial spraying via helicopter (as shown), fixed-wing aircraft, or by ground-based methods using a backpack hand sprayer or truck. Ground spraying is generally applied more frequently as spot treatments to site-specific areas, as needed. In accordance with 14 CFR 137, *Agricultural Aircraft Operations*, the public must be provided at least a 24-hour notice prior to the application of pesticides via aerial spraying (DAF 2019a). Additionally, the installation must notify local beekeepers (apiarists) and beekeeper associations to allow time to protect their beehives in accordance with Presidential Memorandum *Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators* (Pollinator Health Task Force 2015).

The application and disposal of all pesticides would be in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a). The pesticides considered for use would be EPA-approved, follow EPA guidelines, used in accordance with the pesticide label, and would be applied by/or observed only by state-certified personnel authorized to mix or apply pesticides on CONUS DAF installations. Pesticide usage would be installation-specific and dependent on the type of species present within the installation environment. Installations would need to ensure that state or EPA CWA National Pollutant Discharge Elimination System pesticide permits to support aerial application of pesticides would be completed prior to the activity (refer to Section 3.3.2.1 [DAF 2019a]).

Consultation with the USFWS and state Department of Fish and Game or similar regulatory office, may be required if federally listed threatened or endangered species or state-listed species would be present and potentially affected by removal of structures or use of avian control chemicals (i.e., pesticides) or pesticides. Refer to **Section 3.2**, ***Biological Resources*** for additional information regarding potential impacts to wildlife species.

Active Controls

Avicides as presented in **Section 2.5.2** and defined in **Table 2.5-2**, would be administered via treated bait to reduce hazardous bird populations. Use of avicides would be in accordance with DoDI 4150.07, *DoD Pest Management Program* (DoD 2019) and AFMAN 32-1053, *Integrated Pest Management Program* (DAF 2019a). The pesticides considered for use would be EPA-approved, follow EPA guidelines, used in accordance with the pesticide label, and would be applied by/or observed only by state-certified personnel authorized to mix or apply pesticides on CONUS DAF installations.

Starlicide (or DRC-1339) is a restricted use pesticide. Only USDA-WS personnel or persons working under their direct supervision use DRC-1339 (USDA 2019a). See **Section 3.6**, ***Health and Safety***, for information on the potential risks to human health from exposure to the pesticide. Substances used to immobilize and/or euthanize wildlife are not hazardous materials but are regulated as hazardous chemicals; hazardous chemicals are discussed in **Section 3.6**, ***Health and Safety***.

In summary, installation-level management personnel would be included in the environmental project planning review process for proposed BASH management strategies. Installations would continue to follow established DAF, DoD, EPA, and USDA-WS guidelines and procedures for the use of hazardous

materials and management and disposal of hazardous wastes. As such, no significant impact to this resource would be anticipated.

3.5.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to hazardous materials and wastes beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific. The procurement and use of hazardous materials and the management and disposal of hazardous waste would continue to follow the established DAF policies and procedures in compliance with all applicable federal, state, and local laws and DoDIs.

3.6 HUMAN HEALTH AND SAFETY

The primary federal statute addressing occupational hazards is the Occupational Health and Safety Act (29 USC 651 *et seq*.) which created the Occupational Health and Safety Administration (OSHA) and National Institute for Occupational Safety and Health. The DAF is required to ensure the occupational health and safety of all personnel through implementation of DAF Manual 91-203, *Air Force Occupational Safety, Fire, and Health Standards* (DAF 2022b) and DAFI 91-202, *The U.S. Air Force Mishap Prevention Program* (DAF 2020b) which implements Air Force Policy Directive 91-2, *Safety Programs* (DAF 2019b).

3.6.1 Affected Environment

Installations routinely evaluate conditions within the airfield environment and make appropriate changes to mitigate risks when establishing or revising operational procedures to include assessing potential risks from BASH. The Animal Damage Control Act (7 USC 426) authorizes and directs the Secretary of Agriculture to manage wildlife that may be injurious to agricultural interests, other wildlife, or human health and safety, including wildlife hazards to aviation. The USDA-WS is responsible for the implementation of this mandate, and DAF installations request assistance from the USDA-WS in managing wildlife damage and implementing control procedures. USDA-WS responds to requests by providing technical assistance, direct control assistance, and/or research assistance. Technical and direct control assistance may involve the use of either non-lethal or lethal methods, or a combination of the two (USDA 2009).

3.6.2 Environmental Consequences

Impacts to human health and safety would be considered significant if any aspect of the Proposed Action to implement BASH management strategies would substantially increase the risk to the health and safety of personnel or create conditions that were in violation of any federal OSHA regulations, DAF instructions, state, or local regulations. The Security Forces and Safety offices for each installation would be included in the environmental project planning review process for proposed BASH management strategies.

3.6.2.1 Proposed Action

Passive Management

As presented in **Section 2.5.1** and defined in **Table 2.5-1**, passive management would involve the use of equipment to maintain/mow grass, remove/thin tree and scrub stands, demolish obsolete structures, and

apply pesticides. SOPs would be followed, and all activities would be conducted in accordance with federal and state OSHA regulations. Pesticides would be stored, transported, and applied by state-certified and licensed personnel in accordance with product label instructions and federal and state laws. If pesticides would be applied via aerial application, only operators trained and certified for the flight system and equipment to be used would be authorized. All personnel would be required to wear proper personal protective equipment (PPE) such as hard hats, gloves, steel toed boots, eye and ear protection, and long pants/long sleeve shirts as necessary. Surveillance of personnel involved in pesticide mixing and application would be required to ensure prevention of acute pesticide-related illness and/or injury (DAF 2019a; DoD 2019).

The demolition and removal of structures would be performed by qualified personnel who are trained to safely operate the necessary equipment. Proper abatement and/or disposal requirements of PFAS, asbestos or lead-based paint-containing demolition debris would be included in all demolition contracts (DAF 2020c). In addition, observance of existing land use controls of ERP site(s), if located proximate to ground disturbing activities (e.g., demolition or fencing installation), would be observed (DAF 2021b). Engineering controls and precautions would be implemented to protect site construction workers based on the potential for exposure to ERP-managed contaminants. As such, no adverse impact to human health and safety would be expected.

Active Controls

The installations, with assistance from USDA-WS, would implement active controls of harassment, entrapment, and depredation as presented in **Section 2.5.2** and defined in **Table 2.5-2.** All personnel involved in active controls would be required to wear proper PPE and to be knowledgeable in the use of DAF-approved BASH strategies, applicable USDA-WS directives, and local, state, and federal laws.

Harassment: methods used to disperse wildlife include, but are not limited to, pyrotechnics, paintballs, avian lasers, vehicles, and birds of prey. Personnel involved in implementing the methods of dispersal would be properly trained, wear proper PPE to include ear protection, and follow installation-specific SOPs.

Entrapment: use of all traps and trapping devices used for live capture of wildlife would follow the guidance presented in USDA-WS Directive WD 2.450, *Traps and Trapping Devices*. For public safety, warning signs would be posted on main entry or access point where foot/leg-hold traps, neck snares, or body gripping traps would be used. The use of all traps and animal capture devices would comply with applicable federal, state, and local laws and regulations and would be performed by trained personnel whose duties involve animal capture (USDA 2021).

Depredation: substances used to immobilize wildlife are regulated by federal and state laws because of their potential hazards to animals and humans, and potential for substance abuse. Properly trained USDA-WS personnel are certified to acquire, store, or administer immobilization and euthanasia chemicals; these hazardous chemicals must be registered with the EPA and the Food and Drug Administration (USDA 2019b). Starlicide (i.e., DRC-1339) is an avicide currently restricted for use by USDA-WS personnel or persons working under their direct supervision. The chemical is corrosive to the eyes and skin and potentially extremely toxic if inhaled. Exposure is greatest to those that prepare bait material with the product. When used, workers who mix Starlicide with bait material would wear the proper PPE and strictly follow the EPA guidelines. In addition, surveillance of personnel involved in the mixing and

application of this hazardous chemical would be required to ensure prevention of acute pesticide-related illness and/or injury (DAF 2019a; DoD 2019).

Installation and USDA-WS personnel that have been designated to conduct BASH wildlife dispersal and depredation activities via use of air rifles and shotguns would be certified through a National Rifle Association or approved Combat Arms, hunter's safety, or gun handling safety course (DAF 2021a). USDA-WS personnel would be certified through a USDA-WS-approved Advanced Firearms Training and/or Sharpshooter Certification courses (USDA 2016). All personnel involved in shooting activities would be required to wear proper PPE.

In summary, implementation of passive management or active controls would result in minimal risk to the health and safety of installation and USDA-WS personnel with adherence to federal and state OSHA regulations, established DAF instructions and policies, USDA-WS directives, and installation-specific SOPs and monitoring measures. All personnel would be properly trained and wear the appropriate PPE when conducting passive management or active controls. As such, no significant impact to human health and safety would be anticipated.

3.6.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to human health and safety beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific. Installations would continue to follow the established DAF policies and procedures in compliance with all applicable federal, state, and local laws, DAFIs, and DoDIs. USDA-WS would continue to provide assistance to DAF installations in managing wildlife damage and control procedures.

3.7 AIR QUALITY

In accordance with the requirements of the Clean Air Act (CAA) (42 USC 7401 *et seq*.), the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amounts of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Ambient Air Quality Standards

Under the CAA, the EPA developed the National Ambient Air Quality Standards (NAAQS), for "criteria pollutants" that have been determined to affect human health and the environment (40 CFR 50). The CAA also gives authority to states to establish air quality rules and regulations. The EPA classifies the air quality in an air quality control region, or in subareas of an air quality control region, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas where ambient air pollutant concentrations are below the NAAQS are designated as "attainment," while areas where ambient air concentrations are above the NAAQS are designated as "nonattainment."

Areas previously designated as nonattainment that have subsequently demonstrated compliance with the NAAQS are designated as "maintenance" for a period of time (normally 20 years after the effective date of attainment); this time period assumes that the area remains in compliance with the standard. Areas that lack sufficient data to determine their designation are designated "unclassifiable," and are treated as attainment areas for the purpose of stationary source air permitting. In accordance with the CAA, each state must develop a State Implementation Plan, which is a compilation of regulations, strategies, schedules, and enforcement actions designed to achieve compliance or keep the state in compliance with all NAAQS.

The NAAQS represent the maximum allowable concentrations for the designated criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), particulate matter equal to or less than 10 microns in diameter (PM_{10}), and sulfur dioxide (SO_2).

3.7.1 Affected Environment

Air quality in a given location is described by the concentration of various pollutants in the atmosphere, specifically, within the mixing layer. A region's air quality is influenced by many factors including the type and amounts of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Pollutant emissions typically refer to the amounts of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants.

Primary pollutants, such as CO, SO_2, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3, NO_2, and some particulates are formed through chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. Although volatile organic compounds and nitrogen oxides other than NO_2 have no established ambient air quality standards, they are important as precursors to ozone.

3.7.2 Environmental Consequences

Air quality impacts would be significant if emission estimates associated with the Proposed Action would interfere with an installation's attainment status of the NAAQS or applicable State Implementation Plan to attain NAAQS (i.e., nonattainment and maintenance areas). The installation-level air resources manager would be included in the environmental project planning review process for proposed BASH management strategies. Each installation would evaluate implementation of the proposed BASH management strategies to determine the level of emissions on a case-by-case basis. Installations would analyze air quality at either an exempt action screening level or level II quantitative assessment. Not all mobile emission sources utilized for BASH management would necessarily be new emissions sources that would result in a net change, and therefore emission estimations using DAF-approved methodology would be required in some instances.

3.7.2.1 Proposed Action

Passive Management

As presented in **Section 2.5.1** and defined in **Table 2.5-1**, passive management strategies that would have the potential to impact air quality within an installation's air quality control region would occur primarily

from vehicles and equipment used to maintain vegetation; modify water bodies (regrade, fill, or drain); apply pesticides (aerial or ground-based vehicles); demolish obsolete structures, and install fencing.

Fossil fuel-fired construction equipment and vehicles would be a source of combustion emissions of criteria pollutants. Demolition and fence-installation activities would also generate fugitive dust, or particulate matter that is not emitted from a specific point source. The effects of the activities would be temporary, lasting only for the duration of the project. The emissions of fugitive dust would be minimized due to implementation of control measures in accordance with standard construction practices such as spraying of water on exposed soil during construction activities, proper soil stockpiling methods, and prompt replacement of disturbed ground cover or pavement. Additionally, measures to minimize construction combustion emissions would be employed such as using newer model equipment that are equipped with the latest emissions reduction technologies when practical; following manufacturer's operating recommendations regarding good combustion practices; and strict enforcement of idling limits for construction equipment.

Active Controls

Active controls presented in **Section 2.5.2** and defined in **Table 2.5-2** would not change or affect air quality within an installation's air quality control region. While the use of ATVs to disperse wildlife would be a source of combustion emissions of criteria pollutants, use of the vehicles would not be anticipated to affect the overall air quality in any region.

Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the lower atmosphere, warming the earth's surface temperature in a natural process known as the "greenhouse effect." These emissions occur from natural processes and human activities. While climate change results from the incremental addition of GHG emissions from millions of individual sources, the significance of an individual action alone is impossible to assess on a global scale beyond the overall need for global GHG emission reductions to avoid catastrophic global outcomes. Each of the passive management or active controls measures that would involve the use of construction equipment and vehicles would generate GHGs, and in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate change.

In summary, combustive and fugitive dust emissions would produce localized, short-term elevated air pollutant concentrations, which would not result in long-term or significant impacts within the air quality control region of any DAF installation. Activities that involve combustive equipment would contribute to the global GHG inventory, although the contribution would be minimal.

3.7.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to air quality beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

3.8 NOISE

Noise is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Noise may be intermittent or continuous, steady or impulsive, and may be generated by stationary or mobile sources. The individual response to similar noise events can vary widely and is influenced by the type and characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day.

Noise in the U.S. is regulated under a number of different statutes and regulations. The Noise Control Act (42 USC 4901 *et seq*.), and as amended by the Quiet Communities Act (42 USC 4913), set forth the policy of the U.S. to promote an environment for all citizens that is free from noise that jeopardizes human health and welfare. The impact of noise is described through the use of noise metrics which depend on the nature of the event and who or what is affected by the sound.

Sound, expressed in decibels (dB), is created by vibrations traveling through a medium such as air or water. A-weighting (dBA) provides a good approximation of the response of the average human ear and correlates well with the average person's judgment of the relative loudness of a noise event. A sound level of 0 dBA is the approximate threshold of human hearing and is barely audible under extremely quiet conditions. By contrast, normal speech has a sound level of approximately 60 dBA. Sound levels above 100 dBA begin to be felt inside the human ear as discomfort. Sound levels between 110 and 130 dBA are felt as pain (Berglund and Lindvall 1995). The minimum change in the sound level of individual noise events that an average human ear can detect is about 3 dBA. On average, a person perceives a doubling (or halving) of a sound's loudness when there is a 10 dBA change in sound level. The perception and evaluation of sound involves three characteristics, intensity, frequency, and duration. **Table 3.8-1** provides typical noise levels from a variety of sources.

Table 3.8-1. Typical Sound Levels of Familiar Noise Sources

Noise Sources	Typical Sound Level (dBA)
Rifle, shotgun	160-170
Firecracker	150
Human threshold of pain	140
Airplane taking off	120-150
Chainsaw	110
Tractor, heavy truck	90
Gas-powered lawn mower and leaf blowers	80-85
Normal automobile at 50 miles per hour	70
Normal speech/conversation	60
Light auto traffic	50
Library or quiet home	40
Soft whisper	30
Slight rustling of leaves	20
Threshold of Human Hearing	0

Source: EPA 1974.

OSHA regulates noise impacts to workers and establishes thresholds for a safe work environment. OSHA standard 29 CFR 1910.95 provides noise exposure limits for employees in noisy environments or workplaces. According to OSHA, an employee should not be subjected to continuous noise exceeding 90

dBA for durations lasting more than 8 hours per day. As the level increases, the allowed duration of exposure decreases. The maximum limit is 115 dBA for duration of 15 minutes or less.

3.8.1 Affected Environment

Airfield noise accounts for the majority of noise generated on a typical DAF installation. Vehicular traffic and construction-related activities are considered minor sources of noise. Typically, the dBA value for vehicle operations ranges from 50 dBA (for light traffic) to 90 dBA for heavy trucks. Construction-related noise varies greatly depending on the construction process, the type and condition of equipment used, and proximity to the noise emitting source(s). Overall, construction noise levels are governed largely by the noisiest pieces of equipment (e.g., dump truck, excavator, and grader). Typically, the sound level attenuates, or diminishes, at a rate of 6 dBA for each doubling of the distance (i.e., if the noise level is 85 dBA at 50 feet, it is 79 dBA at 100 feet) from a point source (EPA 1971).

3.8.2 Environmental Consequences

Noise-related impacts would be considered significant if the Proposed Action generated noise levels that were incompatible with surrounding land uses or created a situation that endangered human health and safety. Each installation would evaluate noise-generating BASH management strategies in the environmental project planning review process on a case-by-case basis. Potential noise impacts to wildlife are discussed in **Section 3.2**, ***Biological Resources***.

3.8.2.1 Proposed Action

Passive Management

As presented in **Section 2.5.1** and defined in **Table 2.5-1**, passive management strategies that would have the potential to impact noise would occur primarily from equipment used to mow and maintain grass, pesticide application (i.e., tractors, trucks or small aerial vehicles), and construction/demolition activities. This would include the use of some heavy equipment over a temporary period. Construction-related noise emissions from the types of equipment that would be used in implementation of the Proposed Action would range from 74 to 90 dBA when measured 50 feet from the respective piece of equipment (Federal Highway Administration 2006). Construction noise is modeled using the Federal Highway Administration's *Road Construction Noise Model Version 1.1*, which was developed to calculate noise levels emanating from various types of construction equipment. Although developed for road construction, the equipment types and noise calculations apply to any type of construction activity. The Air Force would adhere to OSHA noise safety standards and ensure that construction workers and personnel would not be subjected to continuous noise exceeding 90 dBA for durations lasting more than 8 hours per day. The noise associated with these activities would be most likely confined to weekday working hours (8:00 a.m. to 5:00 p.m.) and are unlikely to adversely alter the surrounding noise environment.

Active Controls

As presented in **Section 2.5.2** and defined in **Table 2.5-2**, active controls would include the use of pyrotechnics, air horns, cannons, distress calls, and rifles/shotguns; all sources of harassment noise intended to disperse wildlife. The sudden noise created would be loud, but not continuous and used occasionally to provide immediate relief of wildlife hazards within the local airfield environment. Personnel involved in application of the noise-inducing harassment measures would be required to wear

proper PPE (i.e., safety earmuff for hearing protection). Noise generated by equipment used for implementation of active controls (e.g., radio-controlled vehicles or ATVs) would be minor and not significant.

In summary, implementation of passive management strategies and active controls would take place in the airfield environment, an environment dominated by military aircraft. None of the activities would be anticipated to create a significant impact or effect a change to the ambient noise environment at any of the CONUS DAF installations.

3.8.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to noise beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

3.9 LAND USE

The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. For land use planning purposes, activities that would no longer be consistent within a designated land use, would require a change in the land use designation.

3.9.1 Affected Environment

There are generally two types of land use areas on a DAF installation: developed and undeveloped. The main categories of developed land use areas include the airfield, industrial areas, administrative facilities, housing, recreation sites, and medical facilities; undeveloped land use areas commonly include natural or cultural resource preservation sites or safety buffers (i.e., clear zones). As defined in **Section 2.1**, ***Proposed Action*** a clear zone is an obstruction-free surface (except for features essential for aircraft operations) on the ground symmetrically centered on the extended runway centerline beginning at the end of the runway and extending outward 3,000 feet. The clear zone width is 3,000 feet (1,500 feet to either side of runway centerline) and constitutes an industrial area for airfield operations.

The Air Force maintains authority and control of land use within its boundary; however, that authority and control does not extend to land use areas outside of the installation's boundary. Adjacent lands may be owned by private citizens, local governments or municipalities, or another federal agency or agencies whose future development and use of the land may not be compatible with a respective DAF installation's mission.

Several programs have been developed to promote compatible land uses next to military installations. The following provides a brief description of the programs.

- Air Installations Compatible Use Zones (AICUZ) program was developed by the DoD as a land use planning tool to promote development compatible with military flight operations. The Air Force-prepared AICUZ study is presented to the local government(s) for consideration in their

land use planning efforts. The program relies primarily on the voluntary actions of the local communities to consider AICUZ recommendations in their planning process.

- Joint Land Use Study (JLUS) is a planning tool used to identify compatible/recommended land use guidelines within, and adjacent to active military installations. The intent of the JLUS is to establish and encourage a working relationship among military installations and stakeholders in the area to work as a team to prevent and/or reduce encroachment issues associated with current and future military missions and neighboring community growth.
- REPI program is a key tool to protect the military missions by helping remove or avoid land use conflicts near installations and addressing regulatory restrictions that inhibit military activities. A key component of the DoD REPI program is the use of buffer partnerships whereas the military services, private conservation groups, and state and local governments share the cost of acquisition of easements or other interests in land from willing sellers to preserve compatible land uses and natural habitats near installations and ranges that helps sustain critical, at-risk military mission capabilities.

3.9.2 Environmental Consequences

Impacts to land use would be considered significant if implementation of the proposed BASH management strategies were incompatible with an installation's development and/or land use plan(s), or if land uses outside of an installation were adversely affected. Each installation would evaluate BASH management strategies in the environmental project planning review process on a case-by-case basis.

3.9.2.1 Proposed Action

Passive Management

Land use within the boundary of DAF installations would not be adversely affected by strategies that involve maintenance of vegetation and wildlife. Application of the strategies presented in **Section 2.5.1** and defined in **Table 2.5-1** would not require changes in an installation's land use or be anticipated to impact existing land use designations outside of an installation's boundary.

Active Controls

Land use within the boundary of DAF installations would not be adversely affected by strategies that involve use of active controls presented in **Section 2.5.2** and defined in **Table 2.5-2.** None of the strategies presented would require changes in an installation's land use or be anticipated to impact existing land use designations outside of an installation's boundary.

In summary, implementation of passive management strategies and active controls would not require a change in land use designations on DAF installations or be anticipated to impact land use designations outside of an installation's boundary. Wildlife that may be attracted to off base land uses such as agriculture or pasture fields or water sources (i.e., stormwater management retention basins) cannot be controlled by BASH management procedures implemented by the DAF. Instead, installations would need to work with the local community, government, and federal agencies through use of the AICUZ, JLUS, or REPI programs to achieve or maintain compatible off base land uses.

3.9.2.2 No Action Alternative

The No Action Alternative would maintain current implementation of existing methods of BASH management at CONUS DAF installations. Impacts to land use beyond those experience from existing and ongoing BASH management strategies and SOPs would not occur. Baseline conditions would continue and would be installation-specific.

4.0 CUMULATIVE EFFECTS

CEQ regulations require that all federal agencies include an analysis of potential direct and indirect cumulative effects on the environment from the incremental effect of a proposed action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from "individually minor but collectively significant actions taking place over a period of time."

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to a proposed action would be expected to have more potential for a relationship than those more geographically separated.

4.1 SCOPE OF CUMULATIVE IMPACTS ANALYSIS

The qualitative analysis in this PEA for implementation of BASH management strategies indicates no significant impact to any resource area. The geographic and temporal boundaries for analysis of cumulative effects would be installation-specific. Installations would be anticipated to apply an adaptive management approach when utilizing approved BASH management strategies. The BASH management strategies could be used interchangeably depending on existing conditions and changing missions needs within the context of an approved BASH plan. Each installation would evaluate the proposed BASH management strategies to determine potential impacts to relative to their location and their respective resources. Should installations need to conduct additional NEPA analysis for implementation of BASH management strategies presented in this PEA, the installations would need to consider only those resources that have the potential to be affected from the direct and indirect incremental effects of the proposed strategies in combination with past, present, and reasonably foreseeable future activities relative to their location.

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6.0 PREPARERS AND CONTRIBUTORS

The following individuals assisted in the preparation of this PEA.

NAME	EDUCATION AND EXPERIENCE
Stantec GS Inc.	
Andersen, Stephen	B.A., Environmental Science Years of Experience: 13
Banwart, Dana	B.S., Biology Years of Experience: 23
Briscoe, Katie	M.S., Archaeology M.A., History B.S., History Years of Experience: 10
Ferguson, Emily	B.A., Public & Urban Affairs Years of Experience: 15
Harrison, Michael	M.S., Environmental Science B.S., Biology Years of Experience: 20
Hoffman, Chareé	B.S., Biology Years of Experience: 22
Jafolla, Caitlin	B.A., Urban Studies and Planning Years of Experience: 9
Simpson, Sharon	B.S., Professional Writing Years of Experience: 20
EAS	
Snipes, Katie	M.S., Environmental Science B.S., Geography, Geography- Natural Resource and Environmental Science Years of Experience: 15
Groppe, Kevin	M.S., Environmental Engineering B.S., Chemical Engineering Years of Experience: 25

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APPENDIX A
CONUS INSTALLATIONS WITH INRMP REQUIREMENT

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DAF installations are responsible for development and implementation of BASH plans to ensure mission capability through the reduction of wildlife hazards to aircraft operations. BASH management plans must be consistent and mutually supported by Integrated Natural Resources Management Plans (INRMPs) which are required for all installations with significant natural resources to ensure compliance with the Sikes Act. The requirement for an INRMP applies to all CONUS DAF installations that meet any of the following criteria:

- on the ground military mission(s) occur on unimproved lands;
- federally protected species are present;
- hunting/fishing programs or other natural-based outdoor recreation activities are permitted;
- out-grants for livestock grazing, crop production, or horseback riding on unimproved lands and/or commercial forestry programs are operated; and/or
- significant BASH issues exist that require habitat and wildlife hazard management.

The CONUS DAF installations with a flying mission that meet the requirement for an INRMP are provided below.

DAF Installation	State
Altus Air Force Base (AFB)	Oklahoma
Arnold AFB*	Tennessee
Barksdale AFB	Louisiana
Beale AFB	California
Buckley AFB – Space Force	Colorado
Cannon AFB	New Mexico
Columbus AFB	Mississippi
Davis-Monthan AFB	Arizona
Dyess AFB	Texas
Edwards AFB	California
Eglin AFB	Florida
Ellsworth AFB **	South Dakota
F.E. Warren AFB	Wyoming
Fairchild AFB	Washington
Grand Forks AFB	North Dakota
Hill AFB **	Utah
Holloman AFB **	New Mexico
Homestead Air Reserve Base	Florida
Hurlbert Field	Florida
Joint Base Andrews	Maryland
Joint Base Charleston	South Carolina
Joint Base Langley/Eustis - Langley	Virginia
Joint Base McGuire-Dix-Lakehurst	New Jersey
Joint Base San Antonio	Texas
Keesler AFB	Mississippi
Laughlin AFB	Texas
Little Rock AFB	Arkansas

DAF Installation	State
Luke AFB **	Arizona
MacDill AFB	Florida
Malmstrom AFB	Montana
March Air Reserve Base	California
Maxwell AFB	Alabama
McConnell AFB	Kansas
Minot AFB	North Dakota
Moody AFB **	Georgia
Mountain Home AFB **	Idaho
Nellis AFB	Nevada
Offutt AFB	Nebraska
Patrick AFB – Space Force	Florida
Peterson AFB – Space Force	Colorado
Robins AFB	Georgia
Scott AFB	Illinois
Seymour Johnson AFB	North Carolina
Shaw AFB **	South Carolina
Sheppard AFB	Texas
Tinker AFB	Oklahoma
Travis AFB	California
Tyndall AFB	Florida
US Air Force Academy	Colorado
Vance AFB	Oklahoma
Vandenberg AFB – Space Force	California
Westover Air Reserve Base	Massachusetts
Whiteman AFB	Missouri
Wright-Patterson AFB	Ohio

Notes: *Arnold AFB does not currently have an active flying mission; however, aircraft operations will occasionally occur; **denotes DAF installations with an associated training range.

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APPENDIX B
INTERAGENCY CORRESPONDENCE AND PUBLIC INVOLVEMENT

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DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER
JOINT BASE SAN ANTONIO LACKLAND TEXAS

28 February 2022

Michael Ackerman
Air Force Civil Engineer Center
National Environmental Policy Act Division (AFCEC/CZN)
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Michael Lamprecht
Environmental Protection Specialist
U.S. Department of Transportation, Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Dear Mr. Lamprecht,

The Department of the Air Force (DAF) is preparing a Programmatic Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with the proposal to implement Bird/wildlife Aircraft Strike Hazard (BASH) mitigation management strategies consistent with the DAF Guidance for BASH Management, AFI 91-212, *Bird/wildlife Aircraft Strike Hazard (BASH) Management Program* at Air Force installations in the continental United States (U.S.). This action is needed to address risks to flight operations and safety and ensure BASH mitigation management strategies comply with all applicable federal regulations, state regulations, and permitting requirements as the service continues to modernize training and air power tactics into the future.

The Air Force has invited the U.S. Department of Agriculture Wildlife Services (USDA-WS) and U.S. Fish and Wildlife Service (USFWS) as cooperating agencies. USDA-WS is the lead federal authority in managing damage to agricultural resources, natural resources, property, and threats to human safety associated with wildlife. USFWS is the lead federal agency in enforcing federal wildlife laws, protecting endangered species, and managing migratory birds.

The Programmatic EA for implementation of BASH management strategies is evaluating two alternatives: the Action Alternative and the No Action Alternative. The Action Alternative would implement an adaptive management approach to BASH mitigation utilizing short, mid, and long-term strategies and nonlethal and lethal techniques, as deemed appropriate to optimize the mitigation of wildlife hazards within the wildlife exclusion zone on all DAF-managed airfields. The No Action Alternative would maintain the status quo whereas implementation of an adaptive management approach to BASH mitigation to comprehensively support the Air Force mission enterprise-wide would not be implemented.

As part of the DAF's Environmental Impact Analysis Process, we request your input in identifying general or specific issues or areas of concern you feel should be addressed in the environmental analysis.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Programmatic Draft EA, please forward your written comments or requests for additional information to me at AFCEC/CZN, ATTN: BASH Programmatic EA, 2261 Hughes Avenue, Suite 155, JBSA Lackland, Texas 78236, or by email to helen.kellogg.1@us.af.mil. We request your comments within 30 days of receipt of this letter to ensure we can address them during the environmental impact analysis process. Thank you for your assistance.

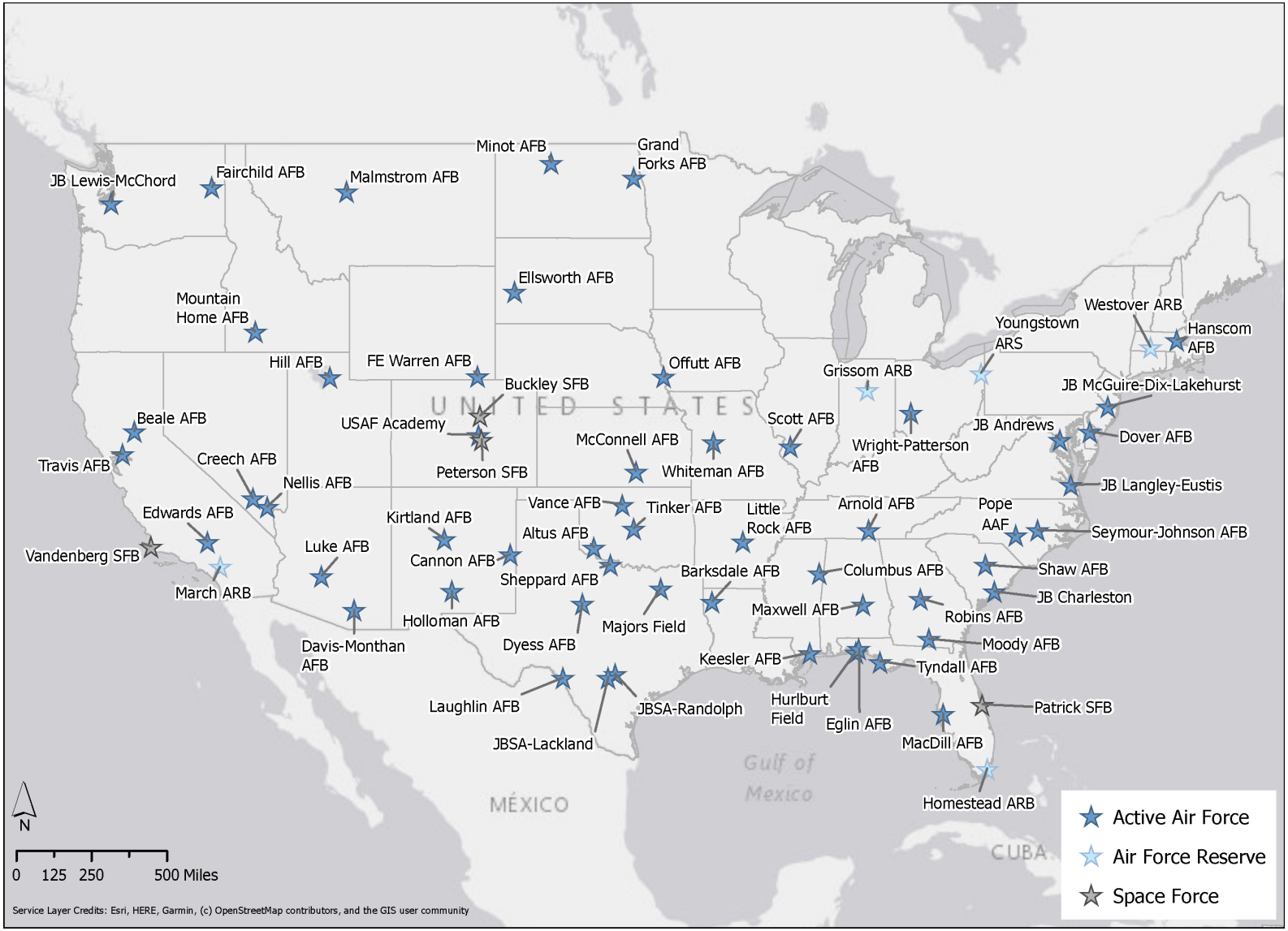
Sincerely,

Michael Ackerman

Michael Ackerman
Department of the Air Force
Environmental Planning, Program Manager

Enclosure: 1. Air Force Installations Map

Enclosure 1


Minot AFB
Grand Forks AFB
JB Lewis-McChord
Fairchild AFB
Malmstrom AFB
Ellsworth AFB
Mountain Home AFB
Westover ARB
Youngstown ARS
Hanscom AFB
Hill AFB
FE Warren AFB
Offutt AFB
Grissom ARB
JB McGuire-Dix-Lakehurst
Buckley SFB
UNITED STATES
Beale AFB
USAF Academy
Scott AFB
JB Andrews
Dover AFB
McConnell AFB
Wright-Patterson AFB
Travis AFB
Creech AFB
Peterson SFB
Whiteman AFB
Nellis AFB
JB Langley-Eustis
Vance AFB
Tinker AFB
Little Rock AFB
Arnold AFB
Pope AAF
Edwards AFB
Kirtland AFB
Seymour-Johnson AFB
Altus AFB
Vandenberg SFB
Luke AFB
Cannon AFB
Barksdale AFB
Columbus AFB
Shaw AFB
Sheppard AFB
JB Charleston
March ARB
Maxwell AFB
Robins AFB
Holloman AFB
Majors Field
Moody AFB
Davis-Monthan AFB
Dyess AFB
Keesler AFB
Tyndall AFB
Laughlin AFB
JBSA-Randolph
Hurlburt Field
Eglin AFB
Patrick SFB
JBSA-Lackland
MacDill AFB
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Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Active Air Force
Air Force Reserve
Space Force

Programmatic Environmental Assessment for Implementation of Bird/wildlife Aircraft Strike Hazard Management Procedures

Scoping letters were sent to the headquarters of the following government agencies:

U.S. Department of Transportation, Federal Aviation Administration, Washington, DC

U.S. Army Corps of Engineers, Washington, DC

U.S. Environmental Protection Agency, Washington, DC

U.S. Department of the Interior, Fish and Wildlife Service, Migratory Birds, Washington, DC

U.S. Department of the Interior, Fish and Wildlife Service, Ecological Services, Washington, DC

U.S. Department of the Interior, Bureau of Land Management National Office, Washington, DC

U.S. Department of the Interior, Bureau of Indian Affairs, Washington, DC

A representative copy of the scoping letter is provided.

APPENDIX C
COOPERATING AGENCY CORRESPONDENCE

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

MEMORANDUM FOR US DEPARTMENT OF AGRICULTURE
ATTN: JANET BUCKNALL, DEPUTY ADMINISTRATOR
USDA APHIS WILDLIFE SERVICES
1400 INDEPENDENCE AVENUE, SW
MAIL STOP: 3402
WASHINGTON, DC 20250-3402

FROM: HQ AFMC/A4/A10/A4C
4375 Chidlaw Road
Wright-Patterson Air Force Base OH 45433-5772

SUBJECT: Department of the Air Force Request for Cooperating Agency Participation on the Programmatic Environmental Assessment for Implementation of Bird/Wildlife Aircraft Strike Hazard Mitigation Procedures

1. The Department of the Air Force (DAF) requests the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) to participate in preparation of a programmatic environmental assessment (EA) analyzing implementation of Bird/Wildlife Aircraft Strike Hazard (BASH) mitigation procedures at DAF installations across the continental United States as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations, 40 CFR §1501.8, *Cooperating Agencies*.

2. As the lead agency IAW 40 CFR §1501.7, the DAF takes responsibility to ensure the requirements of NEPA and CEQ regulations are implemented and asks for the USDA APHIS WS support as a cooperating agency by:

a. Participating in the EA scoping and review process to include consultations, data gathering and analysis, and public involvement;

b. Assuming responsibility, upon request, for developing information and preparing analyses on issues for which the USDA APHIS WS has special expertise. The DAF will coordinate with USDA APHIS WS for purposes of regulatory consultation or coordination requirements;

c. Making staff support available to enhance interdisciplinary review capability;

d. Assisting with resolution of comments, which relate to USDA APHIS WS area of expertise; and

e. Responding in writing to this request.

3. The DAF will provide appropriate, related NEPA information in a timely fashion to avoid unnecessary delays. In turn, the DAF requests USDA APHIS WS to respond in a prompt manner. The lead for the programmatic EA is Ms. Helen Kellogg AFCEC/CZN, who can be reached by email at helen.kellogg.1@us.af.mil. For further questions regarding this memo, the Air Force Materiel Command NEPA Liaison is Ms. Shari Fort, AFIMSC Det 6, who can be reached at 937-902-0769 or by email at shari.fort@us.af.mil.

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Date: 2022.04.25 15:23:19 -04'00'

RONALD J. ONDERKO, P.E., NH-04, DAF
Chief, Civil Engineering Division

cc:
AF/A4CP
AFIMSC Det 6
AF/JAOE-FSC (AFMC)
AFCEC/CZN

United States Department of Agriculture

U.S. Department of Agriculture (USDA)

Animal and Plant Health Inspection Service (APHIS)

Wildlife Services (WS)

Office of the Deputy Administrator

1400 Independence Ave., SW
Washington, DC 20250

HQ AFMC/A4/A10/A4C May 27, 2022

Attn: Ronald Onderko, Chief, Civil Engineering Division
4375 Chidlaw Road
Wright-Patterson Air Force Base, OH 45433-5772

Dear Mr. Onderko,

This is in response to your request on behalf of the Department of the Air Force (DAF) for assistance with NEPA compliance as prescribed under Bird/Wildlife Aircraft Strike Hazard mitigation procedures. USDA Wildlife Services (WS) places a high priority on collaboration with the DAF as we work toward our mutual objective of improving flight/airport safety. WS is committed to a continued strong relationship with the DAF and assisting with this most recent request.

WS has assigned a collaborative team, including Environmental Management and Airport Wildlife Hazards Program staff, to assist with developing NEPA documentation on the proposed DAF wildlife hazard management activities. WS concurs with the conditions of the request as stated in your letter dated April 25, 2022. We look forward to working together toward this end.

Sincerely,

Janet L. Bucknall
WS Deputy Administrator

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

MEMORANDUM FOR US FISH AND WILDLIFE SERVICE
ATTN: GARY FRAZER, ASSISTANT DIRECTOR
ECOLOGICAL SERVICES
1849 C STREET, NW
MIB 3345
WASHINGTON, DC 20240

FROM: HQ AFMC/A4/A10/A4C
4375 Chidlaw Road
Wright-Patterson Air Force Base OH 45433-5772

SUBJECT: Department of the Air Force Request for Cooperating Agency Participation on the Programmatic Environmental Assessment for Implementation of Bird/Wildlife Aircraft Strike Hazard Mitigation Procedures

1. The Department of the Air Force (DAF) requests the U.S. Fish and Wildlife Service (USFWS) Ecological Services (ES) to participate in preparation of a programmatic environmental assessment (EA) analyzing implementation of Bird/Wildlife Aircraft Strike Hazard (BASH) mitigation procedures at DAF installations across the continental United States as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations, 40 CFR §1501.8, *Cooperating Agencies*.

2. As the lead agency IAW 40 CFR §1501.7, the DAF takes responsibility to ensure the requirements of NEPA and CEQ regulations are implemented and asks for the USFWS ES support as a cooperating agency by:

a. Participating in the NEPA scoping and review process to include consultations, data gathering and analysis, and public involvement;

b. Assuming responsibility, upon request, for developing information and preparing analyses on issues for which the USFWS ES has special expertise. The DAF will coordinate with USFWS ES for purposes of regulatory consultation or coordination requirements;

c. Making staff support available to enhance interdisciplinary review capability;

d. Assisting with resolution of comments, which relate to USFWS ES area of expertise; and

e. Responding in writing to this request.

3. The DAF will provide appropriate, related NEPA information in a timely fashion to avoid unnecessary delays. In turn, the DAF requests USFWS ES to respond in a prompt manner. The lead for the programmatic EA is Ms. Helen Kellogg AFCEC/CZN, who can be reached by email at helen.kellogg.1@us.af.mil. For further questions regarding this memo, the Air Force Materiel Command NEPA Liaison is Ms. Shari Fort, AFIMSC Det 6, who can be reached at 937-902-0769 or by email at shari.fort@us.af.mil.

RONALD J. ONDERKO, P.E., NH-04, DAF
Chief, Civil Engineering Division

cc:
AF/A4CP
AFIMSC Det 6
AF/JAOE-FSC (AFMC)
AFCEC/CZN

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

MEMORANDUM FOR US FISH AND WILDLIFE SERVICE
ATTN: ERIC KERSHNER, BRANCH CHIEF
DIVISION OF MIGRATORY BIRD PROGRAM
5275 LEESBURG PIKE, MS-MB
FALLS CHURCH, VA 22041

FROM: HQ AFMC/A4/A10/A4C
4375 Chidlaw Road
Wright-Patterson Air Force Base OH 45433-5772

SUBJECT: Department of the Air Force Request for Cooperating Agency Participation on the Programmatic Environmental Assessment for Implementation of Bird/Wildlife Aircraft Strike Hazard Mitigation Procedures

1. The Department of the Air Force (DAF) requests the U.S. Fish and Wildlife Service (USFWS) Migratory Bird Program (MBP) to participate in preparation of a programmatic environmental assessment (EA) analyzing implementation of Bird/Wildlife Aircraft Strike Hazard (BASH) mitigation procedures at DAF installations across the continental United States as prescribed in the President's Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations, 40 CFR §1501.8, *Cooperating Agencies*.

2. As the lead agency IAW 40 CFR §1501.7, the DAF takes responsibility to ensure the requirements of NEPA and CEQ regulations are implemented and asks for the USFWS MBP support as a cooperating agency by:

a. Participating in the NEPA scoping and review process to include consultations, data gathering and analysis, and public involvement;

b. Assuming responsibility, upon request, for developing information and preparing analyses on issues for which the USFWS MBP has special expertise. The DAF will coordinate with USFWS MBP for purposes of regulatory consultation or coordination requirements;

c. Making staff support available to enhance interdisciplinary review capability;

d. Assisting with resolution of comments, which relate to USFWS MBP area of expertise; and

e. Responding in writing to this request.

3. The DAF will provide appropriate, related NEPA information in a timely fashion to avoid unnecessary delays. In turn, the DAF requests USFWS MBP to respond in a prompt manner. The lead for the programmatic EA is Ms. Helen Kellogg AFCEC/CZN, who can be reached by email at helen.kellogg.1@us.af.mil. For further questions regarding this memo, the Air Force Materiel Command NEPA Liaison is Ms. Shari Fort, AFIMSC Det 6, who can be reached at 937-902-0769 or by email at shari.fort@us.af.mil.

RONALD J. ONDERKO, P.E., NH-04, DAF
Chief, Civil Engineering Division

cc:
AF/A4CP
AFIMSC Det 6
AF/JAOE-FSC (AFMC)
AFCEC/CZN