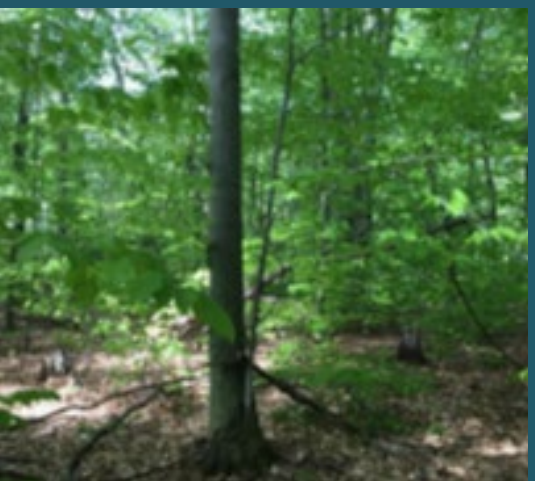
Integrated Natural Resources Management Plan, Environmental Assessment, and Finding of No Significant Impact

Bradley Air National Guard Base and
Orange Air National Guard Station

August 2020



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Finding of No Significant Impact (FONSI) for the Integrated Natural Resources Management Plan / Environmental Assessment Bradley Air National Guard Base, Connecticut

Purpose

Pursuant to the Council on Environmental Quality (CEQ) Regulations (40 *Code of Federal Regulations* (CFR) Parts 1500–1508) for implementing the procedural provisions of the National Environmental Policy Act (NEPA) (42 United States Code § 4321 et seq.) and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP), the Connecticut Air National Guard (CTANG) has conducted an Environmental Assessment (EA) of the potential effects associated with implementing an Integrated Natural Resources Management Plan (INRMP) at the Bradley Air National Guard Base (ANGB) and Orange Air National Guard Station (ANGS), Connecticut. The INRMP has been prepared in accordance with the provisions of the Sikes Act as amended (16 United States Code § 670a et seq.), Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, Department of Defense Manual (DoDM) 4715.03, *INRMP Implementation Manual*, and Air Force Manual (AFMAN) 32-7003, *Environmental Conservation.* The purpose of the INRMP implementation is to comply with the Sikes Act and carry out the set of recommended resource-specific management strategies developed in the INRMP, which would enable CTANG to effectively manage the use and condition of natural resources on Bradley ANGB and Orange ANGS. The EIAP for the implementation of the 2020 CTANG INRMP does not include an analysis of effects for individual actions or projects.

Background

The 103rd Airlift Wing (103 AW) is stationed at the Bradley ANGB at the Bradley International Airport (BIA) in the town of East Granby, CT. The Bradley ANGB is located on 144.77 acres (55.586 hectares) of leased land and 3.9 acres (1.6 hectares) of US Air Force (USAF)-owned land on BIA's west side between Runways 15/33 and 06/24. The 2,385-acre (965.1-hectare) BIA complex is situated in north-central Connecticut within the limits of the towns of East Granby, Suffield, Windsor, and Windsor Locks. The Orange ANGS (22 acres [8.9 hectares]) is located in south-central Connecticut on the border of the towns of Orange and West Haven and approximately 48 miles (77 kilometers) from Bradley ANGB. Bradley ANGB is home to the 103 AW known as the "Flying Yankees" and the 118th Airlift Squadron (118 AS). The mission of the 103 AW is to provide highly trained personnel and mission-ready equipment for dedicated service to the community, the state, and the nation; protecting life and property; and preserving peace, order, and public safety. The 103 AW provides cargo and passenger airlift, medevac, and distinguished visitor support. The primary mission of the 103rd Air Control Squadron is to serve as a Control and Reporting Center for real-time detection, identification and surveillance of air traffic for combat operations and homeland defense.

Proposed Action

The CTANG's Proposed Action is to implement the INRMP, which supports an ecosystem approach and includes natural resources management measures to be undertaken on Bradley ANGB and Orange ANGS. The Proposed Action focuses on a 5-year planning period, which is consistent with the timeframe for the management measures described in the INRMP. Implementation of the Proposed Action would support the CTANG's need to provide realistic training for CTANG personnel in fulfillment of mission requirements while complying with the Sikes Act and other environmental regulations and policies.

Alternatives

The development of proposed management measures for the INRMP included a screening analysis of resource-specific alternatives. The screening analysis involved the use of accepted criteria, standards, and guidelines, when available; and best professional judgment to identify management practices for achieving natural resources management objectives on the installation. The outcome of the screening analysis led to the development of the Proposed Action as described above. Consistent with the intent of NEPA, this screening process focused on identifying a range of reasonable resource-specific management alternatives and developing a plan that could be implemented, as a whole, in the foreseeable future. Management alternatives deemed to be infeasible were not analyzed further. As a result of the screening process, the EA, made an integral part of the INRMP, formally addresses two alternatives: the Proposed Action (i.e., implementation of the INRMP) and the No Action Alternative.

No Action Alternative

Under the No Action Alternative, the proposed management measures set forth in the INRMP would not be implemented. Current management measures for natural resources would remain in effect and existing (i.e., baseline) conditions would continue. The No Action Alternative serves as a baseline against which the Proposed Action can be evaluated. Inclusion of a No Action Alternative is prescribed by CEQ regulations; therefore, the No Action Alternative has been analyzed in the EA, which is included as a component of this INRMP.

Environmental Impacts of the Proposed Action

The EA has evaluated the potential environmental impacts associated with the Proposed Action and No Action Alternative. Potential impacts of the Proposed Action have been assessed for the following environmental resource areas:

Soils- The Proposed Action would minimize impacts on soils associated with erosion and sedimentation resulting in long-term beneficial impacts to the resource. CTANG would take a proactive approach to minimize and prevent soil erosion and compaction through implementation of revegetation plans, including interim mechanisms to stabilize the soil until vegetative cover has become established, and implementation of best management practices (BMPs).

Water Resources- Surface Water and Waters of the US- Implementation of the INRMP is expected to result in beneficial impacts to surface water and Waters of the US (WOTUS). The INRMP describes management activities and projects to prevent potential degradation in water quality and reduce sedimentation from erosion by conducting routine screening of watersheds to evaluate the potential for adverse impacts. Monitoring high risk erosion areas, monitoring re-vegetation efforts, implementing BMPs, and planning and constructing activities in areas that are less likely to impact wetlands would also provide beneficial impacts.

Vegetation- The INRMP includes specific actions to manage installation ecosystems, including wildlife habitat surveys, protection of sensitive ecological areas, and an integrated approach to pest management. Establishment of long-term surveying and monitoring programs under the Proposed Action would provide long-term benefits to the native vegetation on both installations.

Wildlife- Projects listed in the INRMP and management recommendations would provide beneficial impacts to wildlife under the Proposed Action. Wildlife surveys and support of the

2015 Connecticut State Wildlife Action Plan (SWAP) would provide beneficial impacts to regional biodiversity.

Special Status Species- Beneficial effects on special status species at Bradley ANGB and Orange ANGS would be expected with implementation of the INRMP, as it would provide a greater degree of protection and management for species not protected under the Endangered Species Act (ESA), such as state listed species and sensitive habitats. There are no federal threatened and endangered species on Bradley ANGB or Orange ANGS.

Climate Change- Implementation the INRMP would potentially reduce greenhouse gas emission and protect vegetation that is beneficial for uptake of greenhouse gases through the development of a Greenhouse Gas Management Plan and determination of the feasibility of implementing a tree conservation program.

Land Use- Implementation of the INRMP would have long-term beneficial effects on the natural environment within each installation and, over time, ensure the sustainability of Bradley ANGB lands to support training activities and mission requirements (i.e., no net loss in training land).

Cumulative Impacts- Implementation of the INRMP would have long-term positive effects on the natural environment. The Bradley INRMP was developed to be consistent with regional goals and objectives in the 2015 Connecticut SWAP. As development continues in areas adjacent to Bradley ANGB and Orange ANGS, protection and conservation of natural resources within the boundaries of the installation will become more important. As such, a long-term, positive cumulative effect would be expected to natural resources as a result of this INRMP and other natural resources management activities occurring within the region.

Per 40 CFR §1501.7(a)(3), CTANG determined that implementation of the INRMP and associated plans would have no potential impacts on geology, floodplains, air quality, noise, utilities and infrastructure, cultural resources, hazardous materials, socioeconomics, environmental justice, protection of children, human health, and airspace.

Public Involvement

The Sikes Act requires the preparation of an INRMP in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the appropriate state fish and wildlife agency (Connecticut Department of Energy and Environmental Protection [CTDEEP]). In addition, it is required that the resulting Plan reflects the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. The USFWS and CTDEEP participated in the development of the INRMP which ensured that information concerning the natural resources on or in the vicinity of the installation was accurate and presented with acknowledgment to local and regional management strategies.

The Sikes Act also requires public comment on the INRMP at its inception as well as during revisions when there is a mission change. A Notice of Availability was placed in the *Hartford Courant Daily* newspaper on 14 December 2019 to invite the public to comment on the Draft INRMP/EA for a period of 30 days. The documents were available at the East Granby Public Library and the West Haven Public Library. Consultation was undertaken with the USFWS, the U.S. Department of Agriculture/Wildlife Services, and the CTDEEP. Comments from the agencies were incorporated into the INRMP. No other comments were received during the 30-day public review period.

Finding of No Significant Impact

Based on my review of the facts and analyses contained in the INRMP EA, I conclude that implementation of the Preferred Alternative to implement the INRMP would not have any significant direct, indirect, or cumulative impacts on the quality of the human or natural environment. Accordingly, the requirements of NEPA, the CEQ, and 32 *Code of Federal Regulations* 989, et seq. have been fulfilled and an Environmental Impact Statement is not required.

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Marc V Hewett, P.E., GS-15, DAF
Chief, Asset Management Division

Date

SIGNATURE PAGE

The CTANG Integrated Natural Resources Management Plan (INRMP) has been prepared for the 103rd Airlift Wing of the Connecticut Air National Guard (CTANG) at Bradley Air National Guard Base (hereafter Bradley ANGB) and its Geographically Separate Unit (GSU), Orange Air National Guard Station (hereafter Orange ANGS), to manage significant natural resources in support of the training mission. Significant natural resources include the presence of federal and state-listed protected species, forested habitat, and Waters of the United States (WOTUS) including wetlands. The INRMP meets the intent of the Sikes Act (16 United States Code [USC] § 670a–670l, 74 Stat. 1052).

To the extent that resources permit, the US Fish and Wildlife Service (USFWS), Connecticut Department of Energy and Environmental Protection (CTDEEP), and the CTANG, by signature of their agency representative, do hereby agree to work together for the purposes of conserving, protecting, and managing the natural resources present on Bradley ANGB. This INRMP may be modified and amended by agreement of the authorized representatives of the three agencies. The agreement will become effective upon the date of the last signatory and shall continue in full force for a period of 5 years or until terminated by written notice to the other parties, in whole or in part, by any of the parties signing the agreement.

By their signatures below, or an attached sheet, all parties grant their concurrence with and acceptance of the following document.

Approving Officials:

Colonel Roy V. Walton USAF Bradley Air National Guard Base	Date
Thomas R. Chapman, Project Leader US Fish and Wildlife Service	Date
Katie Dykes, Commissioner Connecticut Department of Energy and Environmental Protection	Date

ANNUAL REVIEW DOCUMENTS

This page is used to certify the annual review and coordination of the INRMP.

With the signature below, this document acknowledges that the annual review and coordination of the INRMP has occurred for the specified year.

Year: 2021

Bradley Air National Guard Base	Date
US Fish and Wildlife Service	Date
Connecticut Department of Energy and Environmental Protection	Date

ANNUAL REVIEW DOCUMENTS

This page is used to certify the annual review and coordination of the INRMP.

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Year: 2022

Bradley Air National Guard Base	Date
US Fish and Wildlife Service	Date
Connecticut Department of Energy and Environmental Protection	Date

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Bradley Air National Guard Base	Date
US Fish and Wildlife Service	Date
Connecticut Department of Energy and Environmental Protection	Date

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Year: 2024

Bradley Air National Guard Base	Date
US Fish and Wildlife Service	Date
Connecticut Department of Energy and Environmental Protection	Date

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Record of Review - In accordance with the Sikes Act, Department of Defense Instruction 4715.03, *Natural Resources Conservation Program*, Department of Defense Manual 4715.03, *INRMP Implementation Manual*, and Air Force Manual (AFMAN) 32-7003, *Environmental Conservation*, an Integrated Natural Resources Management Plan (INRMP) is required to be reviewed annually to ensure plans and projects remain current, and every 5 years for operation and effect. Annual reviews and updates are accomplished through annual meetings led by the base Environmental Manager (EM) and attended by the U.S. Fish and Wildlife Service (USFWS), the Connecticut Department of Energy and Environmental Protection (CTDEEP) and, if required, the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). During the annual meetings, actions taken over the previous year are discussed and actions to be taken over the coming year are discussed and agreed to. The meeting is followed up in writing for concurrence by the EM and the representatives from the USFWS and the CTDEEP. As part of the annual and 5-year reviews, the EM shall also hold meetings with internal stakeholders to ensure all personnel and tenants are informed of INRMP requirements.

ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
103 ACS	103rd Air Control Squadron
103 AW	103rd Airlift Wing
118 AS	118th Airlift Squadron
ACS	Air Control Squadron
AFI	Air Force Instruction
AFMAN	Air Force Manual
AMSL	above mean sea level
ANG	Air National Guard
ANGB	Air National Guard Base
ANGRC	Air National Guard Readiness Center
ANGS	Air National Guard Station
ASE	Aerospace Support Equipment
BA	Biological Assessment
BASH	Bird/Wildlife Aircraft Strike Hazard
BHWG	Bird/Wildlife Hazard Working Group
BIA	Bradley International Airport
BMP	Best Management Practice
CATEX	Categorical Exclusion
CCMA	Connecticut Coastal Management Act
CE	Civil Engineer
CECOS	Civil Engineer Corps Officers School
CEQ	Council on Environmental Quality
CESA	Connecticut Endangered Species Act
CFR	*Code of Federal Regulations*
CTANG	Connecticut Air National Guard
CTDEEP	Connecticut Department of Energy and Environmental Protection
CWA	Clean Water Act
DEPARC	Defense Environmental Programs Annual Report to Congress
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DUSD	Deputy under Secretary of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EM	Environmental Manager
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act

FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
FW	Fish and Wildlife
FY	Fiscal Year
GIS	Geographic Information System
GM	Grounds Maintenance and Landscaping
GSU	Geographically Separate Unit
ICRMP	Integrated Cultural Resources Management Plan
IFAW	International Fund for Animal Welfare
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMC	Installation Pest Management Coordinator
JP-4	Jet Petroleum No. 4
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NGB/A4VN NRPM	NGB/A4VN Natural Resources Program Manager
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OPR	Office of Primary Responsibility
OR	Outdoor Recreation
PM	Program Management
POW	Prisoner of War
SWAP	State Wildlife Action Plan
SWPPP	Stormwater Pollution Prevention Plan
TE	Threatened and Endangered
US	United States
USACE	US Army Corps of Engineers
USAF	US Air Force
USC	United States Code
USDA	US Department of Agriculture
USDA-WS	US Department of Agriculture – Wildlife Services
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
WA	Water Resource Protection
WNS	White-nose Syndrome
WT	Wetland Management and Protection
WOTUS	Waters of the US

1.0 EXECUTIVE SUMMARY

The Sikes Act Improvement Act of 1997, 16 United States Code (USC) § 670a et seq., as amended, (herein referred to as the Sikes Act) requires federal military installations with significant natural resources to develop a long-range Integrated Natural Resources Management Plan (INRMP) and implement cooperative agreements with other agencies. The Sikes Act is implemented through Department of Defense (DoD) and US Air Force (USAF) instructions and manuals. The conservation measures discussed in the INRMP help manage water resources, reduce bird/wildlife aircraft strike hazard (BASH) risk, manage federal- and state-listed species, and sustain natural resources. The Connecticut Air National Guard (CTANG) INRMP is intended to be in support of and consistent with the Sikes Act.

The CTANG INRMP is the primary guidance document and tool for managing natural resources on Bradley Air National Guard Base (ANGB) and Orange Air National Guard Station (ANGS). Bradley ANGB occupies approximately 145 acres of leased land and 3.9 acres of USAF-owned land on Bradley International Airport's (BIA's) west side in Hartford County, Connecticut. Orange ANGS occupies approximately 20 acres in New Haven County, Connecticut. All facilities are under the command of the CTANG with the primary purpose of performing fueling, deicing, and maintenance of aircraft and ground vehicles, as well as facilities and aerospace support equipment (ASE) maintenance; providing highly trained personnel and mission-ready equipment for dedicated service to the community, the state, and the nation; protecting life and property; and preserving peace, order, and public safety. Bradley ANGB and Orange ANGS, due to their geographic locations and the nature of the facilities, contain limited, but important habitat and species that require active natural resource management. Natural resource management activities on Bradley ANGB and Orange ANGS must be conducted in a way that provides for sustainable land use, complies with applicable environmental laws and regulations, real estate leases and licenses, and provides for "no net loss" in the capability to support the military mission. This INRMP provides a structure and plan to manage natural resources effectively and ensures that facilities remain available to support the installation's military mission into the future.

Specific goals in the CTANG INRMP are supported by its objectives and work plans, as well as management strategies and specific actions. Goals and objectives are listed in **Section 8**, and work plans are summarized in **Section 9**. The CTANG INRMP provides a description of the installation, the military mission, the environment on the installation, and specific plans and strategies for natural resource management designed for sustainable military training. The implementation of the CTANG INRMP will ensure the successful accomplishment of the military mission while promoting adaptive management that sustains ecosystem and biological integrity and provides for multiple uses of natural resources.

2.0 GENERAL INFORMATION

2.1 Purpose and Scope

This INRMP is the primary guidance document and tool for natural resource management at Bradley ANGB and Orange ANGS that provides for sustainable, healthy ecosystems, complies with applicable environmental laws and regulations, real estate leases and licenses, and provides for "no net loss" in the capability of installation lands to support the military mission. The Installation Vice Commander and Environmental Manager (EM) can use this INRMP to manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the installation's military mission over the long term. The CTANG INRMP is consistent with the

Sikes Act as required by the DoD, USAF, and the National Guard Bureau (NGB). A multiple-use approach is implemented to allow for the presence of mission-oriented activities, as well as protecting environmental quality through the efficient management of natural resources.

This INRMP solely directs lands under the management authority of CTANG. If the CTANG acquires additional lands at some future time, updates of the INRMP will provide management direction for such additional lands and any applicable natural resources management issues. The comprehensive planning process, which incorporates logistics and operations of Bradley ANGB and Orange ANGS, should incorporate the concerns presented in this INRMP, so that the growth of the installation can progress in a manner consistent with, and complementary to, the objectives of the USAF with respect to the protection of natural resources.

2.2 Management Philosophy

2.2.1 Ecosystem Management

Natural resources at Bradley ANGB and Orange ANGS are managed with an ecosystem management approach as directed by Air Force Manual (AFMAN) 32-7003, *Environmental Conservation* and Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program* (Table 1). Ecosystem management may be defined as management to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities. The goal of ecosystem management on military lands is to ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity.

Ecosystem management provides a means for the USAF to conserve biodiversity and to provide high-quality military readiness. This INRMP is a mechanism through which Bradley ANGB can maintain sustainable land use through ecosystem management. Each of the management strategies described in this INRMP should be monitored so that modifications can be made during implementation as conditions change. Human communities are entirely and completely dependent on the goods and services provided by our diverse ecosystems (Bernstein 2008). Decline of these ecosystems, and the biodiversity within them, is one of the foremost limitations to human prosperity. Ecosystem sustainability is the key to both biological diversity and human existence. It is the goal of this INRMP to successfully integrate ecological sustainability with goals and objectives that will sustain human communities and the operational missions of the Bradley ANGB. By protecting a mosaic of habitats that support the greatest variety of life, this INRMP helps perpetuate viable, sustainable populations of native species, and the communities they compose. The protection of these species and communities, in turn, promotes the sustainability of functional ecosystems across the landscape.

Table 1. Elements and Principles of Ecosystem Management

DoDI 4715.03 Elements	
1	Avoid single-species management and implement an ecosystem-based multiple species management approach, insofar as that is consistent with the requirements of the Endangered Species Act (ESA).
2	Use an adaptive management approach to manage natural resources-related issues such as climate change.
3	Evaluate and engage in the formation of local or regional partnerships that benefit the goals and objectives of the INRMP.
4	Use the best available scientific information in decision-making and adaptive management techniques in natural resource management.
5	Foster long-term sustainability of ecosystem services.
AFMAN 32-7003 Principles	
1	Maintain or restore native ecosystem types across their natural range where practical and consistent with the military mission
2	Maintain or restore natural ecological processes such as fire and other disturbance regimes where practical and consistent with the military mission.
3	Maintain or restore the hydrological processes in streams, floodplains, and wetlands when feasible and practical and consistent with the military mission.
4	Use regional approaches to implement ecosystem management on an installation by collaboration with other DoD components as well as other federal, state and local agencies, and adjoining property owners.
5	Provide for outdoor recreation, agricultural production, harvesting of forest products, and other practical utilization of the land and its resources, provided that such use does not inflict long-term ecosystem damage or negatively impact the ANG mission.

2.2.2 Biodiversity

Biodiversity is the degree of variation of life within a given ecosystem, region, or even the entire planet. The DoD's challenge is to manage for biodiversity in a way that supports the military mission. Specific management practices identified in the CTANG INRMP have been developed to enhance and maintain biological diversity within the installation's ecosystems. Ecosystem management includes biodiversity conservation and invasive species control as integral parts of ecosystem management. Air National Guard (ANG) installations maintain or reestablish viable populations of all native species when practical and consistent with the military mission. ANG installations also identify the presence of exotic and invasive species, and implement programs to control and/or eradicate those species. Finally, when feasible, ANG installations develop joint control strategies with other federal, state, and local cooperating agencies and adjacent landowners to increase the effectiveness of control measures and for the benefits illustrated in Figure 1.

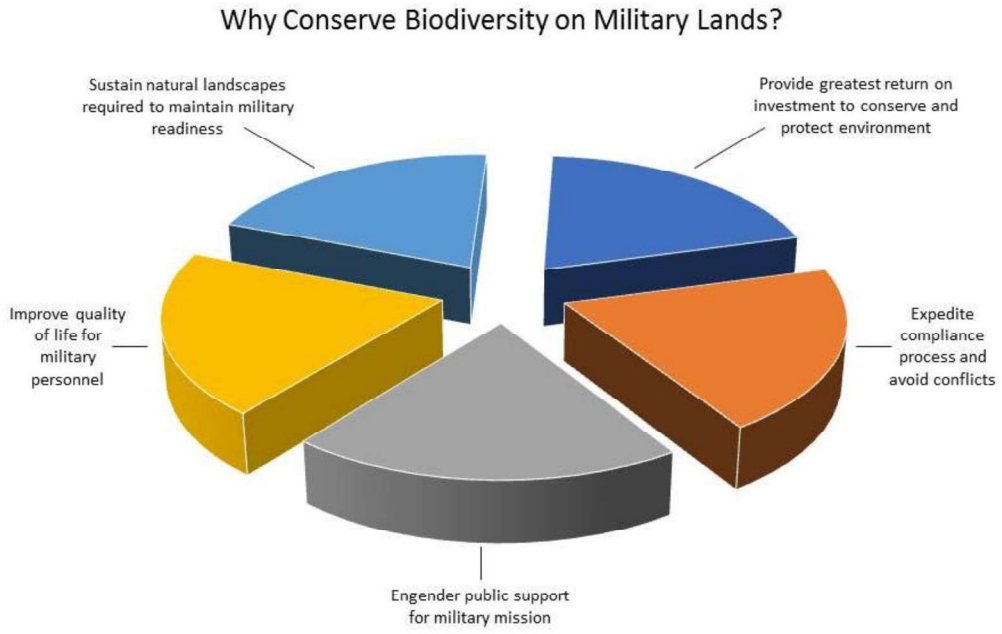


Figure 1. Why Conserve Biodiversity on Military Lands?
**Adapted from Keystone Center, 1996.*

Specific management practices identified in this INRMP have been developed to enhance and maintain biological diversity within the installation boundaries, while providing connectivity to the ecosystems of which the installation is a part. This INRMP is the mechanism through which both ecosystem management and biodiversity conservation will be accomplished on Bradley ANGB and Orange ANGS in agreement with the successful accomplishment of the installation's operational missions. Specifically, management practices are as follows:

- Manage natural resources for long-term use and support of the ANG military mission.
- Minimize habitat fragmentation and promote the natural pattern and connectivity of habitats.
- Protect native species and discourage non-native, invasive species.
- Protect rare and ecologically important species.
- Protect unique or sensitive environments, such as wetlands.
- Maintain or mimic natural processes.
- Restore species, communities, and ecosystems.
- Monitor impacts on biodiversity.
- Recognize the role that trees and ground cover play in stormwater sequestration.
- Preserve trees where possible.

2.3 Authority

2.3.1 Natural Resources Law, Regulations & Policy

The CTANG, U.S. Fish and Wildlife Service (USFWS), and Connecticut Department of Energy and Environmental Protection (CTDEEP) determined an INRMP was required for Bradley ANGB due to the presence of significant natural resources such as state-listed protected species, forested habitat, and Waters of the US (WOTUS) including wetlands, thereby necessitating conservation and management. To ensure proper consideration of fish, wildlife, and habitat needs, this INRMP was prepared in cooperation with the USFWS and CTDEEP. The draft INRMP was provided to the USFWS and CTDEEP for review and comment. A Task Force meeting was held in September 2019

to discuss the draft INRMP and all interested parties, such as US Department of Agriculture – Wildlife Services (USDA-WS), USFWS, CTDEEP, NGB, and the CTANG were invited. Comments received on the draft INRMP were incorporated into the final INRMP. DoDI 4715.03, *Natural Resources Conservation Program*, identifies the DoD policies and procedures concerning natural resources management and INRMP reviews, public comment, and endangered species consultation. INRMPs are required to be jointly reviewed by the USFWS, CTDEEP, and the ANG installation for operation and effect on a regular basis, but not less often than every 5 years. Minor updates and continued implementation of an existing INRMP do not require need for public comment. Major revisions to an INRMP do require an opportunity for public review. Specific projects in the INRMP may need informal or formal consultation under the Endangered Species Act (ESA) Section 7 depending on identifiable impacts to natural resources. No federally listed species or designated critical habitat have been identified at either Bradley ANGB or Orange ANGS.

2.3.2 National Environmental Policy Act Compliance

The Environmental Impact Analysis Process (EIAP) is the process by which federal agencies facilitate compliance with environmental regulations. The primary legislation affecting these agencies' decision-making process is the National Environmental Policy Act of 1969 (NEPA; 42 USC § 4321 *et seq*.). NEPA requires that any organization using federal monies, proposing work on federal lands, or requiring a federal permit consider potential environmental consequences of proposed actions. The law's intent is to protect, restore, or enhance the environment through well-informed decisions.

The Council on Environmental Quality (CEQ) was established under NEPA for the purpose of implementing and overseeing federal policies as they relate to the NEPA process. The adoption of an INRMP can be considered a major federal action as defined by 40 CFR §1508.18 of the CEQ regulations. This requires an analysis of potential environmental impacts for the implementation of an INRMP, although a complete environmental assessment (EA) is not necessarily required as individual actions and projects for an INRMP typically undergo their own separate NEPA analysis.

CEQ regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process, CTANG notifies relevant federal, state, and local agencies and allows them sufficient time to make known their environmental concerns specific to a proposed action. Comments and concerns submitted by these agencies during the IICEP process are subsequently incorporated into the analysis of potential environmental impacts. This coordination fulfills requirements under Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, and Air Force Instruction (AFI) 32-7060, IICEP. Furthermore, public participation in decision-making on new proposals is also required. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. Agencies, organizations, and members of the public with a potential interest in a proposed action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate.

The EIAP for the implementation of CTANG's 2020 INRMP was conducted in accordance with NEPA, CEQ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 *Code of Federal Regulations* [CFR] § 1500-1508), and the USAF NEPA regulation 32 CFR Part 989. The EIAP and decision-making process for the Proposed Action (implementation of the 2020 CTANG INRMP) involved an examination of all environmental issues pertinent to the action proposed. Impact evaluations of the 2020 CTANG INRMP determined that no significant environmental impacts would result from implementation of the Proposed Action or any identified alternative. This determination was based on thorough review and analysis of existing resource information, and coordination with knowledgeable, responsible personnel from Bradley

ANGB and other relevant local, state, and federal agencies. The EIAP for the implementation of the 2020 CTANG INRMP does not include an analysis of effects for individual actions or projects. Individual actions or projects that have the potential to impact the environment will be analyzed separately in accordance with the NEPA process.

ANG installations initiate EIAP by completing USAF Form 813 through ANG Readiness Center's (ANGRC's) online NEPA Tool. The ANGRC reviews the Form 813 and associated information to determine if the proposed action requires a categorical exclusion (CATEX), EA, or environmental impact statement (EIS).

2.3.3 Responsibilities

The CTANG INRMP has been organized to ensure the implementation of year-round, cost-effective management activities and projects that meet the requirements of the installation. Various personnel and organizations within the ANG that are responsible for the implementation of this INRMP are described in the following subsections.

2.3.3.1 Installation Vice Commander

The Installation Vice Commander oversees the installation and is responsible for ensuring that the goals and objectives of this INRMP are implemented to the fullest extent practicable based on funding and manpower availability. The Installation Vice Commander is the official signatory for the CTANG INRMP.

2.3.3.2 Base Civil Engineer

The Base Civil Engineer (CE) plans, budgets, approves, and oversees all maintenance and construction activities performed on the installation. All maintenance and construction-related projects or management activities proposed in this INRMP should be approved by the Base CE to ensure that funding is available and these projects are complementary to the installation's comprehensive planning processes.

2.3.3.3 NGB/A4VN Natural Resources Program Manager

The NGB/A4VN Natural Resources Program Manager (NGB/A4VN NRPM) is the technical point of contact on all natural resource related activities for the ANG. The NGB/A4VN NRPM tracks DoD and USAF policies and approves funding for projects identified as a priority in the CTANG INRMP. The development of projects included in the INRMP and any deviations from those projects will be submitted to the NGB/A4VN NRPM for review. Decisions resulting from those reviews will be a cooperative effort between the NGB/A4VN NRPM and the EM and/or the Installation's Natural Resources Manager, when applicable.

2.3.3.4 Environmental Manager

The EM plans, budgets, approves, and oversees all environmental activities performed on the installation and is responsible for ensuring that activities associated with the implementation of this INRMP adhere to applicable federal, state, local, and USAF environmental regulations and guidelines. Projects proposed in the CTANG INRMP are reviewed by the EM and the NGB/A4VN NRPM. The EM should independently review deviation from the projects proposed in this INRMP. Persons responsible for implementation of the INRMP are required to attend the Civil Engineer Corps Officers School (CECOS) DoD Natural Resources Compliance course (http://www.netc.navy.mil/centers/csfe/cecos/CourseDetail2.htm#tab25).

2.3.3.5 Pest Management Coordinator

The Installation Pest Management Coordinator (IPMC) is responsible for the control of undesirable and/or nuisance plants and animals (including insects), and prevention of damage to natural resources. Pest management personnel utilize Integrated Pest Management (IPM) approaches and are responsible for the implementation of the IPM Plan. The IPMC is also responsible for submitting monthly pesticide usage reports to the NGB/A4VN Pest Management Consultant. The IPMC will, when required, obtain depredation permits for the management of wildlife on the installation and/or in the confines of the airfield on behalf of or in cooperation with the Safety Office and the USDA-WS Specialist. The IPMC is also responsible for coordinating with the installation's Public Health Officer and/or Medical offices to ensure monitoring efforts and control methods for potential disease vectors or animals of other medical importance are specified in the IPM Plan and reported on. The IPMC will coordinate pest management activities with the EM to ensure sensitive areas are identified and to ensure actions taken do not impact those sensitive areas. The IPMC will ensure the goals and objectives of pest management activities are explained in the INRMP and will report all pest management activities to the INRMP Working Group and when applicable, the Bird/Wildlife Hazard Working Group (BHWG).

2.3.3.6 Wing Safety Office

The Wing Safety Office is responsible for development, implementation, and management of the BASH Program at Bradley ANGB. The Wing Safety Office also ensures that bird/wildlife strikes resulting from aircraft assigned to transient units at Bradley ANGB are accurately documented and reported to the EM and the USAF BASH Team. The Wing Safety Office participates in Bradley ANGB's BHWG, which conducts meetings to evaluate and refine strategies for the reduction of BASH risk on Bradley ANGB. The Wing Safety Office is responsible for coordinating with and providing required information on BASH activities to the EM and ensures that the BHWG conducts meetings on the reduction of the BASH threat on the installation.

2.3.3.7 Airfield Management

Airfield Management is responsible for ensuring that the airfield is acceptable and appropriate for flight activity.

2.3.3.8 US Department of Agriculture – Wildlife Services

The USDA-WS is responsible for monitoring hazardous wildlife that have the potential to create an aircraft strike hazard. USDA-WS personnel support activities that pertain to the BASH Program and are responsible for wildlife depredation requirements within the airfield, as well as dispersal/harassment, capture and translocation, trapping and removal, and surveillance and monitoring. The USDA-WS will coordinate efforts in regard to the removal of species and studies needed with the EM.

2.3.3.9 Operations and Maintenance

Operations and Maintenance personnel are responsible for all grounds maintenance activities on the installation. Operations and Maintenance personnel will assist the IPMC and the EM in the implementation of natural resource management projects when applicable. The Operations and Maintenance personnel will also periodically review grounds maintenance equipment to determine if new or additional equipment is needed for the proper maintenance of the installation's landscapes.

2.3.3.10 Legal Office - 103 AW/JA

The Legal Office is responsible for ensuring the implementation of the management objectives contained within the CTANG INRMP meet all regulatory and statutory requirements that pertain to natural resources management. The Legal Office will review any future natural resources management proposals and alert the Installation Vice Commander and the EM should there be any regulatory conflicts or shortfalls. In addition, the legal office will keep participating INRMP parties informed of any new statutes or regulations that might affect natural resources management.

2.3.3.11 Public Affairs Office

The Public Affairs Office is responsible for the coordination of public access for events at Bradley ANGB or Orange ANGS. The Public Affairs Office serves as the point of contact to interface between the Installation Vice Commander and civilian groups interested in installations for environmental, educational, or other purposes.

2.3.3.12 US Fish and Wildlife Service

The USFWS is a signatory of the CTANG INRMP and provides input regarding natural resource projects and operational component plans. The USFWS alerts the EM whenever new species added to the federal threatened and endangered species lists have the potential for inhabiting Bradley ANGB or Orange ANGS. In addition, the USFWS, when feasible, will support ANG wildlife and vegetation surveys conducted at CTANG properties.

2.3.3.13 Connecticut Department of Energy and Environmental Protection

The CTDEEP is the state fish and wildlife agency and is a signatory of the INRMP, providing input regarding natural resource projects and operational component plans. The CTDEEP alerts the EM whenever new species added to the state threatened and endangered species lists have the potential for inhabiting Bradley ANGB or Orange ANGS. In addition, the CTDEEP, when feasible, will support ANG wildlife and vegetation surveys conducted at CTANG properties.

2.4 Integration with Other Plans

By its nature, an INRMP is multidisciplinary and provides a summary of natural resources and associated management at a specific installation. As a result, information from an INRMP is incorporated into other plans and other plans are written to support an INRMP. CTANG plans include the following:

- BASH Plan. Provides a summary of the BASH Program on Bradley ANGB, including techniques, processes, responsibilities, and management recommendations (CTANG 2018a).
- IPM Plan. Provides a summary of management of pest species to minimize impact to mission, natural resources, and the environment (CTANG 2018b).
- Stormwater Pollution Prevention Plan (SWPPP). Provides an overview of prevention and management of stormwater (CTANG 2006a, 2006b, and 2018c).
- Integrated Cultural Resources Management Plan (ICRMP) for the Bradley ANGB and the Orange ANGS. Provides a plan for management of cultural resources, including legal requirements, known cultural resources, processes and responsibilities (CTANG 2018d).

In addition, this INRMP is also integrated with the following plans from other agencies.

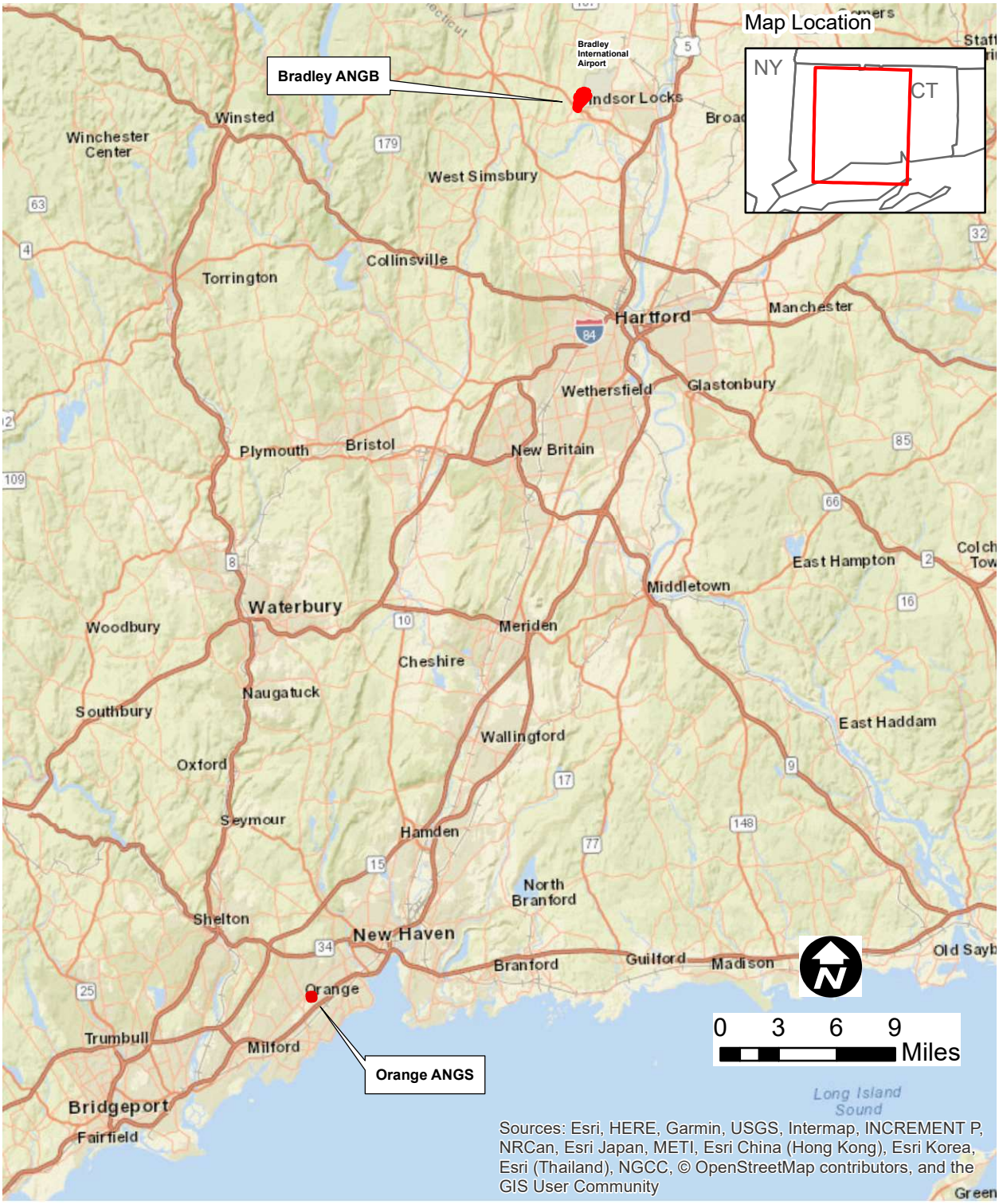
- Connecticut State Wildlife Action Plan (SWAP). The DoD and the ANG encourage integration of SWAP as part of a comprehensive installation natural resources program. The 2015 SWAP provides CTDEEP with important tools for restoring and maintaining critical habitats and populations of the state's species of conservation and management concern as well as conserving Connecticut's wildlife diversity (CTDEEP 2015a). Conservation actions identified to protect Connecticut's list of species of greatest conservation need and key habitats included high priority actions such as monitoring, research, and survey needs. Several tools for conservation planning and information management to track implementation and effectiveness of the conservation actions were included in the 2015 SWAP (CTDEEP 2015a). CTANG will consult with the regional CTDEEP office to determine areas where the installation can participate in future wildlife conservation partnerships with the CTDEEP in support of the SWAP. In addition, the CTDEEP will be integral in discussion of future revisions to the INRMP.
- The BIA Wildlife Hazard Management Plan. CTANG personnel will continue to work with airport personnel on BASH reduction efforts (BIA 2012).

3.0 INSTALLATION OVERVIEW

3.1 Location and Area

The 103rd Airlift Wing (103 AW) is stationed at the Bradley ANGB at the BIA in the town of East Granby, CT. The Bradley ANGB is located on 144.77 acres (55.586 hectares) of leased land and 3.9 acres (1.6 hectares) of USAF-owned land on BIA's west side between Runways 15/33 and 06/24. The 2,385-acre BIA complex is situated in north-central Connecticut within the limits of the towns of East Granby, Suffield, Windsor, and Windsor Locks (Figure 2). The installation itself is located in the town of East Granby; the taxiways, runways, and other airside facilities are located in the towns of Suffield, Windsor, and Windsor Locks. Access to the installation is primarily provided from Nicholson Road, which connects with Bradley Park Road, East Street, and Perimeter Road. State Route 20, the Bradley Field Connector, also provides access between the installation, BIA, and Interstate 91. The 103 AW operates and maintains facilities with a total floor space of approximately 313,000 square feet. Over the years, a large aircraft parking apron and numerous roads have been constructed at the facility. Underground storage tanks, oil/water separators and stormwater control piping have also been installed on the facility. Maintenance of the facility buildings and operation of an airplane refueling facility are routinely performed on site (CTANG 2018b).

The Orange ANGS is located in south-central Connecticut on the border of the towns of Orange and West Haven. The installation is located approximately 4 miles south of New Haven and approximately 2 miles north of Long Island Sound. The main entrance to the property is located on an access road off Boston Post Road, to the northeast of Indian River Road. The property boundary of the 103rd Air Control Squadron (103 ACS) encompasses approximately 22 acres with four buildings.



Legend

- Bradley ANGB Installation Boundary
- Orange ANGS Installation Boundary

ANGB - Air National Guard Base
ANGS - Air National Guard Station

Figure 2. Bradley ANGB and Orange ANGS Regional Map

3.2 Installation History

Historic use of the land that now composes the BIA airfield complex appears to have been limited. Early development of the surrounding towns occurred near their respective cores, away from the airfield complex. The area that now encompasses BIA was used for agriculture (tobacco fields and other crops) from the 18th century until 1941 when the State of Connecticut purchased 2,000 acres of land in Windsor Locks to facilitate construction of an Army Air Corps military airfield (ANGRC 1992). The 103 AW is the third oldest ANG unit in the United States. The CTANG was established in 1923 at Brainard Field in Hartford with the first aircraft, the Curtis JN-4, arriving in 1924. In 1940, the unit converted to a fighter/bomber mission with P-40 and P-51s. The federal government constructed the airfield and support facilities and the airport opened in the summer of 1941. In 1942, after much pleading from Britain who was experiencing a drastic lack of space for prisoners of war (POWs), the US Government agreed to take 50,000 prisoners from camps in Britain. It was impossible to estimate the actual number of prisoners that would filter into the states during the war; the estimated 50,000 was far exceeded. POWs began arriving in America by May 1942. In 1944, Bradley Field created a German POW camp using 4 acres of the base. After World War II, the prisoner of war camp was dismantled and the federal government returned the property to the State of Connecticut to expand the airport

In 1956, the Air Force Reserves leased the land of the present ANG facility from the state, and preliminary construction of the current facilities began. Following the Korean War, the unit began flying F-84, F-86, F-100A and F-102 aircraft and in 1961, following support for the Berlin Crisis, the unit moved to its current location. In 1971, the unit began flying the F-100D and F models for Tactical Air Command and then in 1979, the unit converted to flying the A-10s. A tornado struck the northeast area of the facility in 1979 and devastated many buildings, forcing the CTANG to move all of its remaining operations to the southwestern corner of BIA where the current ANG facility is located (Figure 3). While maintaining A-10s, the unit began flying C-21 aircraft in support of airlift missions in 2007. The Wing supported the separate aircraft missions until the Base Realignment and Closure–driven mission change in April 2008, which removed the A-10s (CTANG 2013).

The Orange ANGS was used by the US Army for NIKE radar facilities, administration functions, and barracks from 1957 to 1960. The installation was deactivated in 1960 and remained unoccupied until 1962, when the property was transferred to the CTANG. Since 1962, the CTANG has continuously operated a satellite radar facility on the installation property (Figure 4). In 2003, all nine of the original NIKE facilities were demolished.

The Orange ANGS currently consists of two functional areas (CTANG 2017):

- Main entrance, vehicle and equipment storage, pump house for fire service, and warehouse buildings in the lower section.
- Operation and maintenance facility, radar tower, vehicle and equipment storage, and refueling station in the upper section.

Figure 3. Bradley ANGB Installation Map

Legend

Bradley ANG Installation Boundary

ANGB - Air National Guard Base

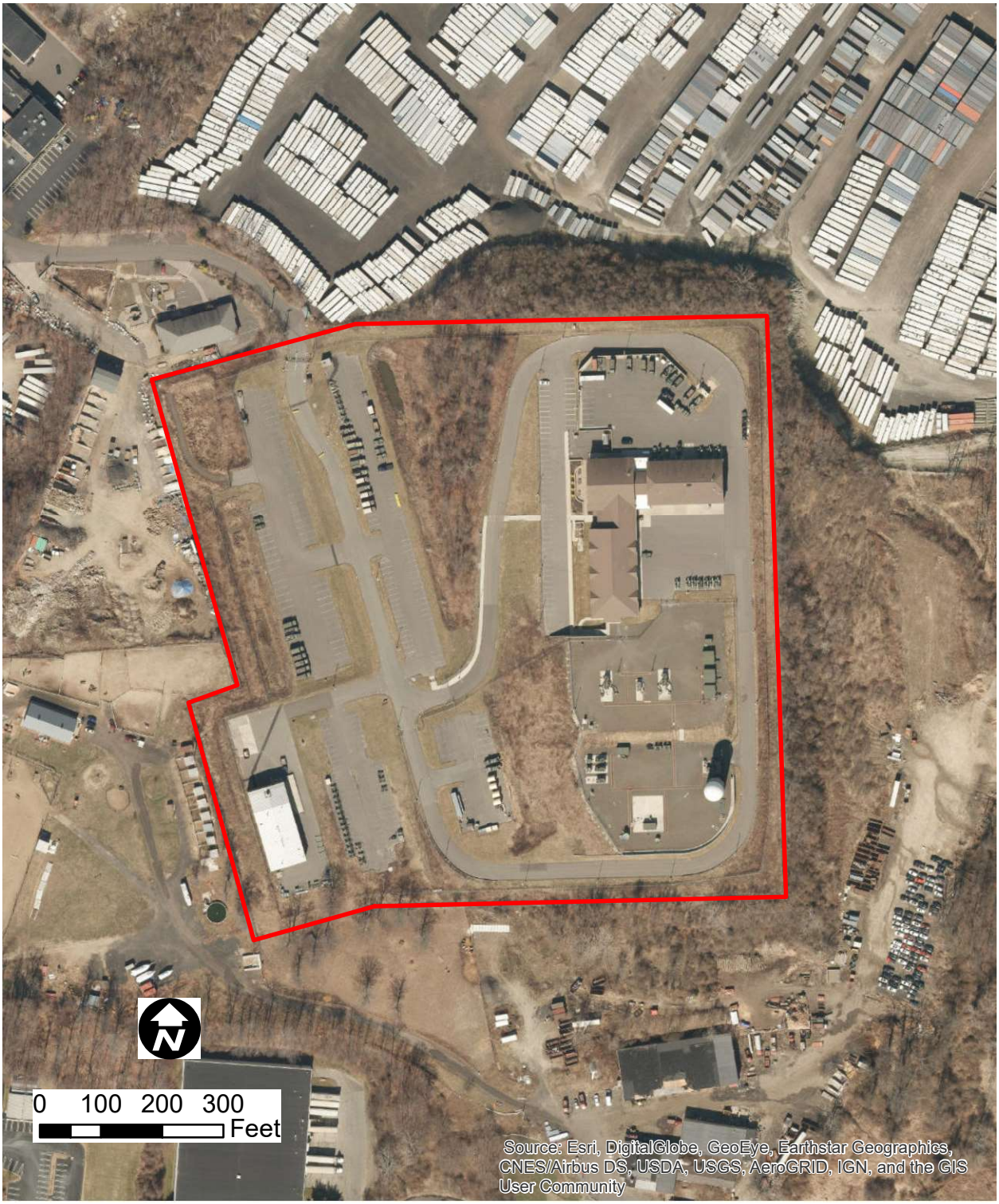


Figure 4. Orange ANGS Map

Legend

Orange ANGS Boundary

ANGS - Air National Guard Station

3.3 Military Missions

Bradley ANGB is home to the 103 AW known as the "Flying Yankees" and the 118th Airlift Squadron (118 AS). The mission of the 103 AW is to provide highly trained personnel and mission-ready equipment for dedicated service to the community, the state, and the nation; protecting life and property; and preserving peace, order, and public safety. The 103 AW provides cargo and passenger airlift, medevac, and distinguished visitor support. The role of the 103 Air Operations Group is to analyze, strategize, plan, and direct joint air power during combat operations. The 103 AW currently has an authorized manpower of 969 and flies and maintains eight primary assigned aircraft (PAA; C-130H aircraft) to support its air lift mission and Airspace Control Authority.

The main support operations performed at the 103 AW include aircraft and ground vehicle fueling, aircraft deicing, aircraft and ground vehicle maintenance, and ASE and facilities maintenance. These operations involve activities such as corrosion control, non-destructive inspection, fuel cell maintenance, engine maintenance, hydraulics, and wheel and tire maintenance (CTANG 2013). There are currently no tenant organizations on Bradley ANGB.

The primary mission of the 103 ACS is to serve as a Control and Reporting Center for real-time detection, identification and surveillance of air traffic for combat operations and homeland defense. The mission of the 103 ACS supports both federal and state responsibilities. On the federal level, the unit's mission is to maintain combat forces ready for mobilization, deployment, and employment as needed to support national security objectives. The unit's state mission is to protect the peace and personal property and to assist the State of Connecticut in the event of natural disasters or civil disturbance (CTANG 2018e). One of the most important tasks performed by the unit is combining its datalink/communications components, air control capability, and computerized air surveillance and identification functions to provide a decentralized battle management service (CTANG 2018e).

3.4 Surrounding Communities

Town of East Granby

Of the approximately 11,136 acres which make up East Granby, 3,472 acres (31.2 percent) are either developed or committed to a specific use. The predominant land use is residential, which occupies about 41 percent of the developed land in East Granby. Approximately 20 percent of the total amount of land is currently permanently preserved and managed open space. The remaining developed land is comprised of commercial and industrial uses. In addition, BIA occupies about 583 acres of the town (East Granby 2017).

Town of Windsor Locks

The largest single land use in Windsor Locks is residential (32 percent of land area). Residential density is low (4.4 persons per acre), and the housing stock is predominately single family (76 percent). Over half (57 percent) of the land area in Windsor Locks is devoted to commercial, industrial, and transportation uses. BIA also occupies over 1,080 acres (19.8 percent of land area) in the western portion of the town; BIA's terminal facilities are located within the town of Windsor Locks. The remaining 12 percent of land is recreational or in agriculture use (Windsor Locks 2007).

Town of Suffield

The northern portion of BIA is located in the Town of Suffield. Land surrounding BIA is mostly open space/undeveloped; however, it is zoned for future industrial development. The town center, which includes the Suffield Historic District, is located about 2 miles northeast of the airport's boundary. Recent growth has caused the town to shift from a rural agricultural community to a

suburban population center. Residential use makes up 89 percent of the land use for the town (Town of Suffield 2010). To address growth, Suffield's land use and planning policies focus on the preservation and enhancement of farmland; the town has preserved since 2007 over 1,800 acres of farmland and has long-term goals of preserving about 55 percent (including agriculture) of total land area as open space (Town of Suffield 2010).

Town of Windsor

The Town of Windsor is located at the southern end of BIA. Residential land comprises the largest percentage (30 percent) of use in the town with agriculture (16 percent) and open space (13 percent) representing the next two largest uses (Windsor 2015).

Town of Orange

Orange ANGS straddles the border of the towns of Orange and West Haven, CT. The town of Orange is mostly zoned for residential, business, business development, roads/railways, industrial, or institutional purposes (79 percent of 11,190 acres). The remaining 21 percent is open spaces including agricultural areas. The town is committed to acquiring and preserving open spaces for community enhancement. They are also committed to farm, undeveloped land, as well as scenic, historic, and character resources preservation (Orange Town Plan and Zoning Commission 2015).

Town of West Haven

The town of West Haven is approximately 7,040 acres in size and is bounded on the east and south by Long Island Sound. Land use is highly fragmented, though commercial land use is generally downtown; industrial land use occurs near the railway; and residential, institutional, and open spaces take up the area in-between (West Haven Department of Planning and Development 2017).

3.5 Local and Regional Natural Areas

Adjacent to the Bradley ANGB is designated Connecticut Critical Habitat identified in the Connecticut Wildlife Action Plan which addresses criteria required under Public Laws 107-063, 108-447, and 109-54 (CTDEEP 2015a). The Sand Barren habitat consists of dry sandy deposits with woody or grassy vegetation maintained by fire or disturbance. Subtypes include sparsely vegetated sand, sandplain grassland, pitch pine scrub, and riverine dredge spoils (CTDEEP 2015a; CTDEEP 2018).

4.0 PHYSICAL ENVIRONMENT

4.1 Climate

Bradley ANGB is located in north-central Connecticut where the climate is highly influenced by warm air from the Gulf Stream and air moving east from the interior United States and Canada. The climate is classified as mid-latitude moist continental characterized by strong seasonal temperature contrasts and highly variable day-to-day weather. July is the warmest month of the year with an average maximum temperature of 85 degrees Fahrenheit (°F) (29 degrees Celsius [°C]), while January is the coldest month with an average minimum temperature of 17 °F (-8.3 °C). April is the wettest month of the year with an average rainfall of 3.9 inches (9.9 centimeters); however, rainfall is fairly evenly distributed throughout the year (NOAA 2018).

Average annual precipitation for Windsor Locks is 44.10 inches (112.0 centimeters) (NOAA 2018). There is little variability in month to month averages, with a minimum of 3.22 inches (8.18 centimeters) for February and July and a maximum of 4.10 inches (10.4 centimeters) for November (NOAA 2018). It should be noted that while there is not much fluctuation evident in the monthly

averages, the observed actual monthly totals often do vary greatly depending on timing and strength of weather patterns and individual storm systems. Snow is not uncommon during the winter months in north-central Connecticut. Snowfall totals can vary greatly from year to year, but the region receives an average of approximately 40.99 inches (104.1 centimeters) annually (NOAA 2018). The prevailing wind direction for the region is from the west. It becomes more southwesterly during the summer and more northwesterly in the winter. However, local topography can greatly influence prevailing wind speed and direction.

Orange ANGS has a seasonally temperate climate with cold winters and warm summers. The winter temperature ranges from lows near 25 ºF (-3.9 °C) to highs near 40º F (4.4 °C). The summer temperature ranges from lows near 60 ºF (16 °C) to highs near 85 ºF (29 °C). The average annual precipitation is 49.4 inches (125 centimeters) per year. The average annual snowfall is 26.2 inches (66.5 centimeters) per year (CTANG 2018b).

Climate Change

DODI 4715.03 requires the INRMP to include an assessment of the potential impacts of climate change on natural resources and to adaptively manage such resources to minimize adverse mission impacts. In January 2005, Connecticut joined the other New England states and the Eastern Canadian provinces to unveil a regional Climate Change Action Plan. This regional plan was designed to reduce greenhouse gas emissions to 1990 levels by the year 2010, with a further 10 percent reduction by 2020. In 2015, the governors and premiers adopted Resolution 39-1 to include a regional reduction marker to reduce regional greenhouse gas emissions by at least 35 to 45 percent below 1990 levels by 2030 (NEG-ECP 2017). Climate change could have serious impacts on the state's diverse ecosystems, native species and may encourage the spread of nonnative species. It would also likely alter the natural range of many different plants and animals. In addition, in 2011, Connecticut developed a "Connecticut Climate Change Preparedness Plan" to "evaluate the projected impacts of climate change on Connecticut agriculture, infrastructure, natural resources and public health and develop strategies to mitigate these impacts" (CTDEEP 2011).

4.2 Landforms

The Bradley ANGB is situated on a broad and level plateau located between the floodplain of the Connecticut River to the east, and the pronounced upland ridges of Peak Mountain to the west. The majority of the base lies at an elevation of 170 feet (51.8 meters) above mean sea level (AMSL), and is generally flat and level terrain (CTANG 2018d). Slope in the area of the base is 0 to 2 percent (Figure 5). The surrounding topography trends downward to the north toward a marshy lowland created by DeGrayes and Stony Brooks. Slope to the south is slightly steeper, trending down toward Rainbow Reservoir, an artificial lake behind a dam on the Farmington River further to the east. The topography rises to the west, toward a long and narrow ridge southeast of the town of East Granby. Elevations at the top of this ridge reach 270 feet (82.3 meters) AMSL. This landform is the beginning of the trap-rock ridge formations that run north-south from the Long Island Sound into Massachusetts (CTANG 2018d).

The Orange ANGS is situated upon a pronounced landform known locally as Marsh Hill. This landform rises to an elevation just over 240 feet (73.1 meters) AMSL, nearly 100 feet (30 meters) higher than the surrounding narrow ridge-top landscape. Slope at the base of the hill ranges from 3 to 8 percent, with steeper slopes on the hillside ranging from 15 to 25 percent. The topography of the surrounding area drops steadily to the east toward Cove River, which empties into the Long Island Sound (sea level) approximately 1.5 miles to the southeast (CTANG 2018d).

Figure 5. Bradley ANGB Landscape

4.3 Geology and Soils

The following geological description is summarized from the CTANG ICRMP (CTANG 2018d). BIA and the present ANG facility are located within the heart of the Central Valley, designated as the North-Central Lowlands eco-region. The Central Valley encompasses an area that measures approximately 95 miles (152.8 kilometers) in length by 32.2 kilometers (20 miles) in width, with its southernmost point in the vicinity of the towns of Glastonbury and Rocky Hill, CT. This region is known for its distinctive red soil caused by the constant erosion of the bedrock.

Following deglaciation between approximately 17,000 and 13,000 years ago, the Central Valley was inundated by glacial Lake Hitchcock. This impoundment of glacial meltwater was facilitated by a build-up of glaciolacustrine sediments between Glastonbury and Middletown, CT. Glacial Lake Hitchcock extended for more than 241.4 kilometers (150 miles) north-south and approximately 32.2 kilometers (20 miles) east-west, and extended into present day Connecticut. A series of studies has found that Lake Hitchcock formed approximately 15,600 years ago and that it remained in place for approximately 3,000 years, until the built-up sediments at Middletown, CT breached and the lake drained. Geological investigations of the dry lakebed soils indicate that the draining of glacial Lake Hitchcock was very rapid, and that it produced many unique geological features, including such aeolian features as massive sand dunes and lacustrine spits that provide the basis for modern terrace and inland physiography.

In addition to the low rolling valley floor, the Central Valley also contains a series of high traprock ridges. The largest of these flanks the western border of the valley, and is known as Metacomet Ridge. The ridge consists of dense traprock or basalt, and unlike the remainder of the Central Valley's easily eroded sandstone and brownstone, is very erosion-resistant. The basalt from the traprock ridges was quarried by prehistoric Native American groups and used for stone tool manufacturing.

Soils underlying the Bradley ANGB include: Windsor Loamy Sand; Urban Land Soils; Udorthents-Urban Land Complex Soils; Udorthents-Smoothed Soils; Rippowam Fine Sandy Loam; and Saco Silt Loam (Figure 6; NRCS 2018). The predominant naturally-occurring soil found at the installation is the Windsor Loamy Sand; these soils are characterized as excessively drained and rapidly permeable, and are considered well suited for development. In contrast, the Saco Silt Loam soils found on the lower northwest and southwest portions of the installation are generally not suited for development due to the potential for periodic flooding (CTANG 2013).

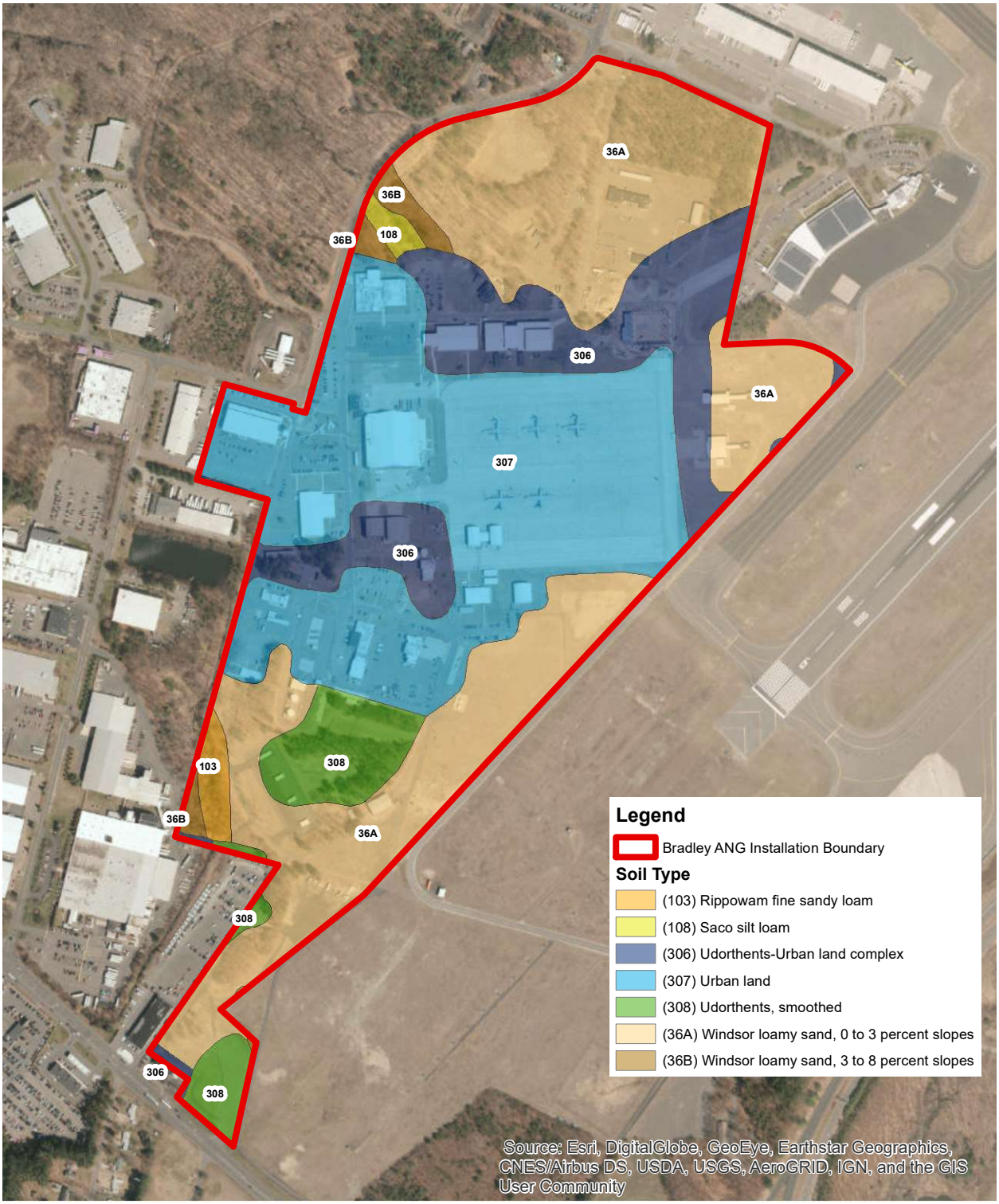
The Orange ANGS is situated within a geologic formation that is characterized by Schist, gneiss and phyllite of the Orange-Milford belt found in the western Connecticut highlands (CTANG 2018d). Soils underlying the Orange ANGS facility are characterized by loamy soils formed on broad glacial till plains of the Charlton-Hollis-Leicester soil association (Figure 7). The entirety of the Marsh Hill area is mapped as part of the Paxton soil series, described as typically well-drained, very stony, fine sandy loam soils commonly formed on the sides of glacial landforms such as drumlins, and upland ridges and hills (CTANG 2018d).

4.4 Hydrology

Water resources typically encompass both surface water and groundwater. Surface water resources include lakes, rivers, and streams, while groundwater comprises subsurface hydrologic resources. Surface waters at Bradley ANGB are limited to drainage ditches for stormwater runoff, as well as drainage basins that support the installation's industrial activity stormwater permit and discharge into nearby surface waters. Bradley ANGB is situated close to two major rivers: the Connecticut and the Farmington. The area is drained by several tributaries of these streams, including DeGrayes and Stony brooks to the west, Spencer and Little brooks to the north and east; and Seymour and Hathaway Hollows to the south (CTANG 2018d). The airport drains predominately north into tributaries of Stony Brook, or south into Rainbow Brook and Seymour Hollow, which are tributaries of the Farmington River. Kettle Brook receives drainage from one small portion of the airport. All rivers and streams located near the installation are eventual tributaries of the Connecticut River (Figure 8).

Hartford County is located in the Connecticut River Valley, an area that is underlain by a sequence of interbedded sedimentary and igneous rocks covered discontinuously by unconsolidated glacial sediments. Unconsolidated stratified drift aquifers are the predominant groundwater source in the area. Groundwater in the region encompassing BIA and the Bradley ANGB is found in the deltaic silts and sands and in the Portland Arkose formation which underlies the installation (CTANG 2009).

The Orange ANGS is located less than 3 miles west of New Haven Harbor, which marks the confluence of the West, Mill and Quinnipiac rivers as they empty into the Long Island Sound (CTANG 2018d). The headwaters and tributaries of Oyster River flow directly east and west of the Marsh Hill landform, draining the area immediately surrounding the Orange ANGS property (Figure 9). The Cove River drains the valley directly east of the upland landform upon which the facility is situated (CTANG 2018d).



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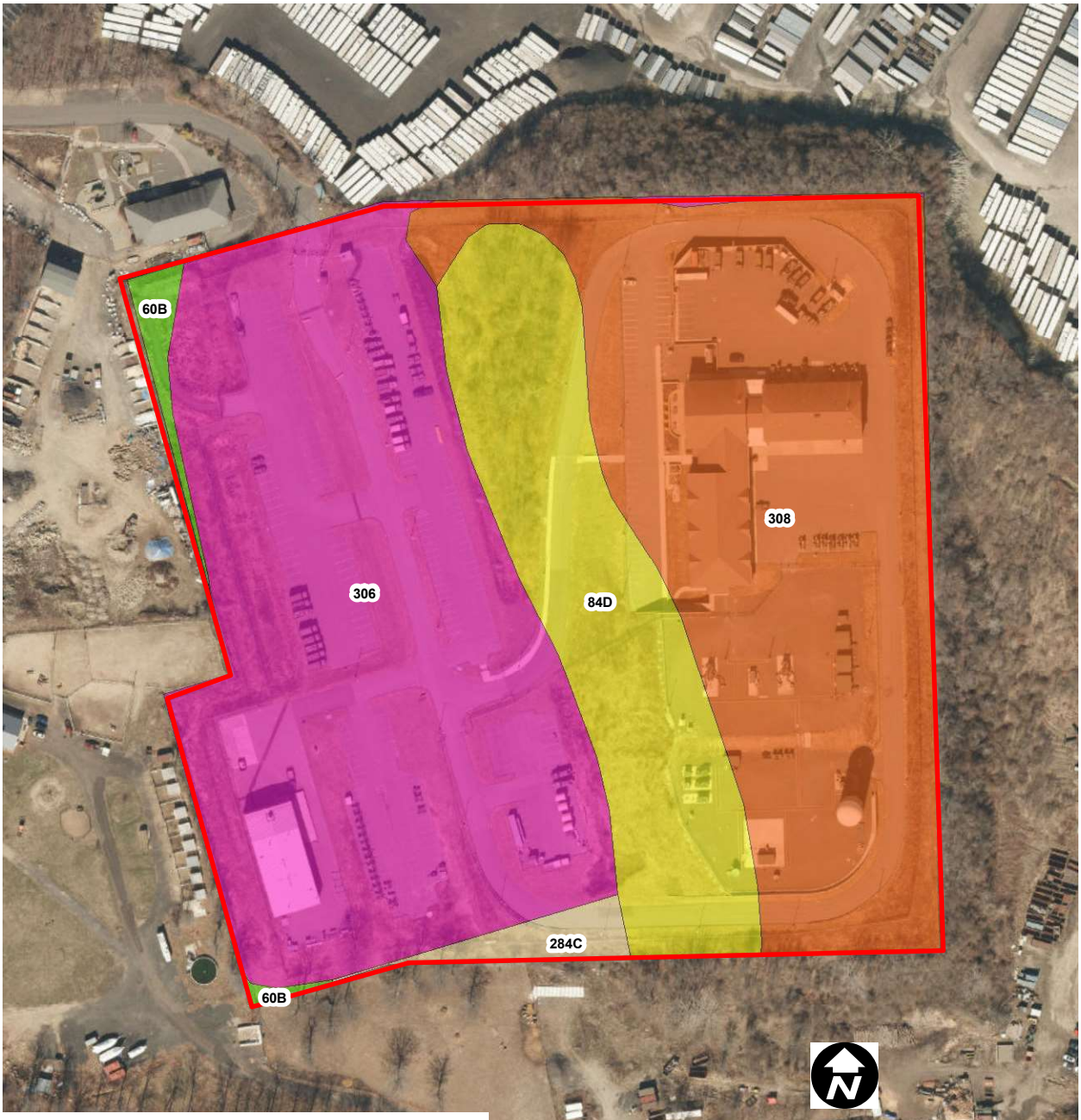
Feet

Figure 6. Soil Map for Bradley ANGB

ANGB - Air National Guard Base



Legend

Orange ANGS Boundary

Soils

- (284C) Paxton-Urban land complex, 8 to 15 percent slopes
- (306) Udorthents-Urban land complex
- (308) Udorthents, smoothed
- (60B) Canton and Charlton fine sandy loams, 3 to 8 percent slopes
- (84D) Paxton and Montauk fine sandy loams, 15 to 25 percent slopes

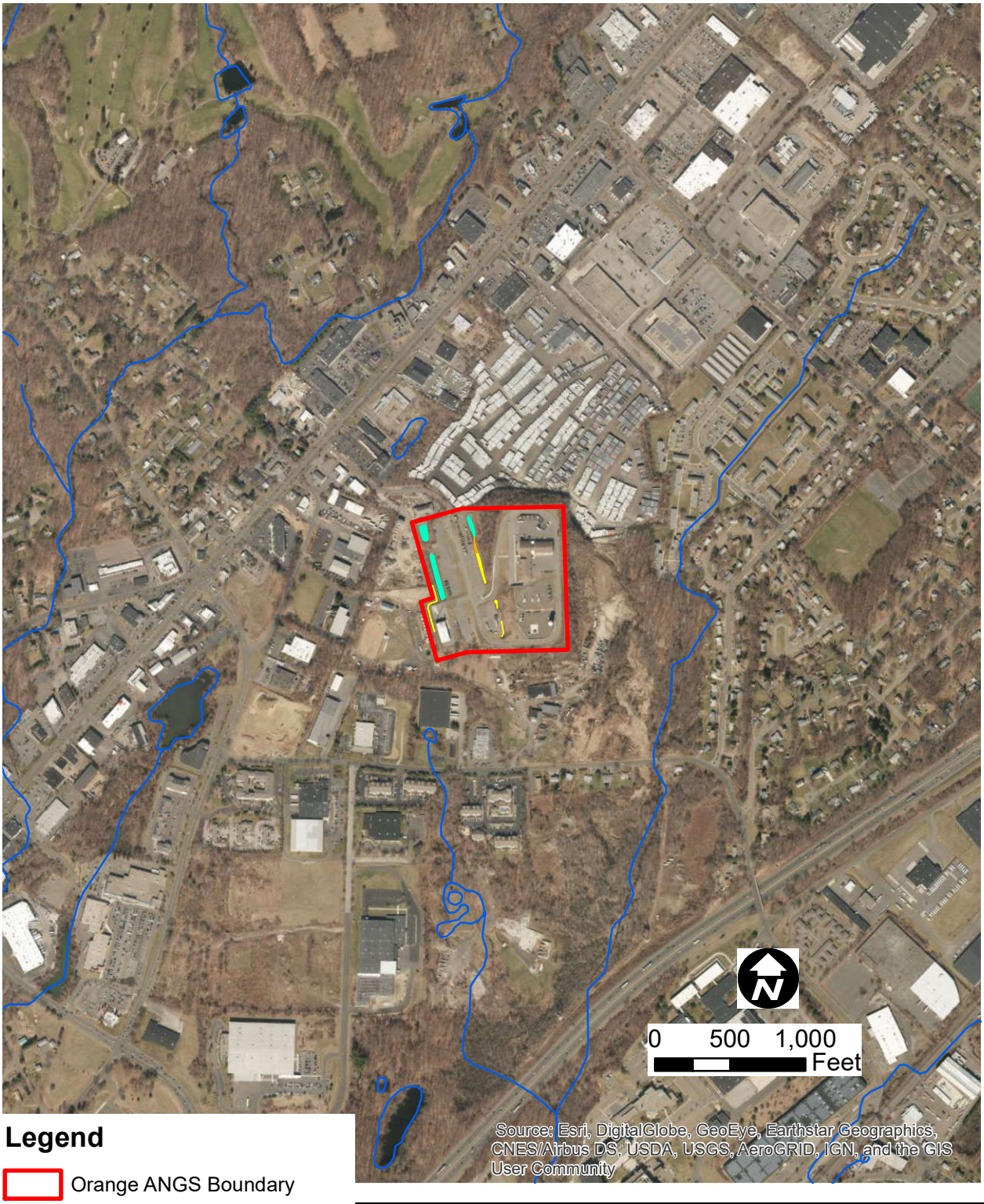
ANGS - Air National Guard Station

Figure 7. Soil Map for Orange ANGS

0 1,000 2,000 Feet

ANGB - Air National Guard Base

Figure 8. Hydrology Map for Bradley ANGB



Legend

- Orange ANGS Boundary
- Hydrology

Hydrological Feature

- Stormwater Basin
- Stormwater Swale
- Stormwater Swale with Gravel

ANGS - Air National Guard Station

Figure 9. Hydrology Map for Orange ANGS

5.0 ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

5.1 Ecosystem Classification

The Bradley ANGB and Orange ANGS are in the Eastern Broadleaf Forest (Oceanic) Province ecoregion (Bailey et al. 1995). This ecoregion is diverse: west of the Appalachian Mountains are the Appalachian Plateaus, consisting of elevated hills and mountains, 984 to 2,952 feet (300 to 900 meters) in height; while to the east are the Piedmont Plateau and coastal plain, ranging from sea level to around 984 feet (300 meters). A winter deciduous forest covers the ecoregion, consisting of mixed mesophytic, Appalachian oak, and pine-oak vegetation types.

5.2 Vegetation

5.2.1 Historic Vegetative Cover

Historically, almost all of Connecticut was covered by woodlands. Clearing of the state's lowland areas commenced during initial settlement by Europeans in the seventeenth century, and accelerated rapidly as the demand for agricultural land increased in the 1800s. Today, only scattered fragments of the woodlands remain (Hochholzer 2015).

5.2.2 Current Vegetative Cover

Most of the land on Bradley ANGB has been paved, graded, landscaped, or otherwise modified. However, approximately one-third of the installation's 144.77 acres (55.586 hectares) consists of mixed deciduous and coniferous woodlands. Surveys of the entire installation's habitats, including these forested areas, took place in 2017 (CTANG 2018e and 2019a). Forested areas on Bradley ANGB occur mainly on the northern and southern ends of the installation and contain a mixture of 35 percent coniferous trees with a species richness of four, and 65 percent deciduous trees with a species richness of 14 (Table 2). The forest survey focused on standing timber at or in excess of 8 inches (20.32 centimeters) in diameter. Thus the total stand of tree cover is a total of 687 trees ranging in diameter from 8 inches to 4 feet (121.92 centimeters). The dominant coniferous species include pitch pine (*Pinus rigida*), Eastern white pine (*Pinus strobus*), and red pine (*Pinus resinosa*). The dominant deciduous species consist of American beech (*Fagus grandifolia*), white oak (*Quercus alba*), black oak (*Quercus velutina*), white ash (*Fraxinus americana*), and red oak (*Quercus rubra*).

During the 2017 survey, a total of 133 unique plant species were observed (Table 3) across three habitat types (Figure 10; CTANG 2019a). Habitat 1 contained upland forested areas, encompassed 32.5 acres, and 56 unique plant species were found. This habitat type was dominated by deciduous forest that included American beech, white oak, red oak, and Eastern white pine, with black cherry (*Prunus serotine*) dominant along the edges (CTANG 2019a).

Habitat 2 consisted of forested and scrub-shrub wetland areas, totaled 1.2 acres, and included 62 unique species. The forested wetland areas included canopy, understory, and herbaceous layers. The canopy layer included red maple, blackgum (*Nyssa sylvatica*), green ash (*Fraxinus pennsylvanica*), and birch species (*Betula* spp.); the understory included blackgum and highbush blueberry (*Vaccinium corymbosum*); and the herbaceous included skunk cabbage (*Symplocarpus foetidus*) and jewelweed (*Impatiens capens*is). Scrub shrub areas contained common reed (*Phragmites australis*), cinnamon fern (*Osmunda cinnamomea*), and broadleaf cattail (*Typha latifolia*; CTANG 2019a).

Table 2. Tree Species at Bradley ANGB

Scientific Name	Common Name	Total Number	Percent of Total
Coniferous Species			
Pinus strobus	Eastern white pine	42	6.1
Pinus rigida	pitch pine	176	25.6
Pinus resinosa	red pine	24	3.5
Tsuga canadensis	Eastern hemlock	1	0.1
Deciduous Species			
Acer platanoides	Norway maple	4	0.06
Acer rubrum	red maple	3	0.4
Acer saccharinum	sugar maple	3	0.4
Betula nigra	river birch	2	0.3
Betula papyrifera	white birch	8	1.2
Betula pendula	silver birch	13	1.9
Fagus grandifolia	American beech	157	22.9
Fraxinus americana	white ash	28	4.1
Nyssa sylvatica	black gum	3	0.4
Prunus serotina	black cherry	5	0.7
Quercus alba	white oak	153	22.3
Quercus palustris	pin oak	9	1.3
Quercus rubra	red oak	25	3.6
Quercus velutina	black oak	31	4.5

Table 3. Vascular Plant Species at Bradley ANGB

Scientific Name	Common Name	Scientific Name	Common Name
Acer platanoides	Norway maple	*Parthenocissus quinquefolia*	Virginia creeper
Acer rubrum	red maple	*Peltandra virginica*	green arrow arum
Achillea sp.	yarrow	*Phalaris arundinacea*	reed canarygrass
Allium vinale	wild garlic	*Phragmites australis*	common reed
Alnus incana	speckled alder	*Picea abies*	Norway spruce
Anemone quinquefolia	wood anemone	*Picea omonka*	Serbian spruce
Arisaema triphyllum	jack in the pulpit	*Pieris japonica*	Japanese pieris
Aronia arbutifolia	red chokeberry	*Pinus rigida*	pitch pine
Asclepias syriaca	common milkweed	*Pinus strobus*	white pine
Barbarea vulgaris	wintercress or garden yellowrocket	*Plantago lanceolata*	English plantain
Berberis thunbergii	Japanese barberry	*Plantago major*	common plantain
Betula lenta	black birch	*Polygonatum biflorum*	smooth solomon's seal
Betula nigra	river birch	*Polygonum cuspidatum*	Japanese knotweed
Betula papyrifera	paper birch	*Polygonum pensylvanicum*	Pennsylvania smartweed
Betula populifera	gray birch	*Polygonum persicaria*	spotted ladys thumb

Scientific Name	Common Name	Scientific Name	Common Name
Carex sp.	sedge species (immature)	*Polystichum acrostichoides*	Christmas fern
Carpinus caroliniana	American hornbeam	*Populus deltoides*	Eastern cottonwood
Carya sp.	hickory species	*Potentilla* sp.	cinquefoil
Carya virginiana	hop hornbeam	*Prunus serotina*	black cherry
Celastrus orbiculatus	oriental bittersweet	*Prunus virginiana*	chokecherry
Chimaphila maculata	striped wintergreen	*Pyrus calleryana*	callery or bradford pear
Clematis sp.	virginsbower	*Quercus alba*	white oak
Cornus florida	flowering dogwood	*Quercus rubra*	red oak
Cornus sericea	redosier dogwood	*Quercus velutina*	black oak
Cornus sericea	variegated redosier dogwood	*Ranunculus ambigens*	waterplantain spearwort
Cynodon dactylon	bermudagrass	*Ranunculus repens*	creeping buttercup
Diervilla lonicera	bush honeysuckle	*Rhododendron* sp.	azalea
Digitaria sp.	crabgrass	*Rhus typhina*	staghorn sumac
Duchesnea indica	Indian strawberry	*Robinia pseudoacacia*	black locust
Elaeagnus umbellata	autumn olive	*Rosa multiflora*	multiflora rose
Equisetum arvense	field horsetail	*Rosa* sp.	hybrid tea rose
Erythronium americanum	trout lily, dogtooth violet	*Rubus occidentalis*	black raspberry
Fagus grandifolia	American beech	*Rumex acetosella*	red sorrel
Festuca sp.	fescue	*Rumex crispus*	curly dock
Forsythia sp.	forsythia	*Sambucus racemosa*	red elderberry
Fragaria virginiana	Virginia strawberry	*Sassafras albidum*	sassafras
Fraxinus americana	white ash	*Solidago* sp.	goldenrod
Fraxinus pennsylvanica	green ash	*Spiraea japonica*	Japanese meadowsweet
Galium aparine	cleavers, stickywilly	*Symplocarpus foetidus*	skunk cabbage
Gaultheria procumbens	eastern teaberry	*Syringa vulgaris*	lilac
Geranium maculatum	wild or spotted geranium	*Taraxacum officinale*	common dandelion
Geum aleppium	yellow avens	*Taxus cuspidata*	Japanese yew
Hibiscus syriacus	rose of sharon	*Thalictrum thalictroides*	rue anemone
Hosta sp.	plantain lily	*Thuja occidentalis*	arborvitae
Houstonia sp.	bluet	*Toxicodendron radicans*	poison ivy
Impatiens capensis	jewelweed	*Trifolium pratense*	red clover
Iris sp.	iris (no flower)	*Trifolium repens*	white clover
Julgans nigra	black walnut	*Trifoliunm aureum*	golden or hop clover
Juniperus horizontalis	creeping juniper	*Trillium erectum*	red trillium
Juniperus virginiana	Eastern redcedar	*Tsuga canadensis*	eastern hemlock
Kalmia latifolia	mountain laurel	*Typha latifolia*	broadleaf cattail
Lemna sp.	duckweed	*Ulmus rubra*	slippery elm
Lepidium campestris	field peppergrass	*Vaccinium angustifolium*	lowbush blueberry
Lindera benzoin	northern spicebush	*Vaccinium corymbosum*	highbush blueberry
Liriodendron tulipifera	tuliptree	*Verbascum thaspus*	mullein

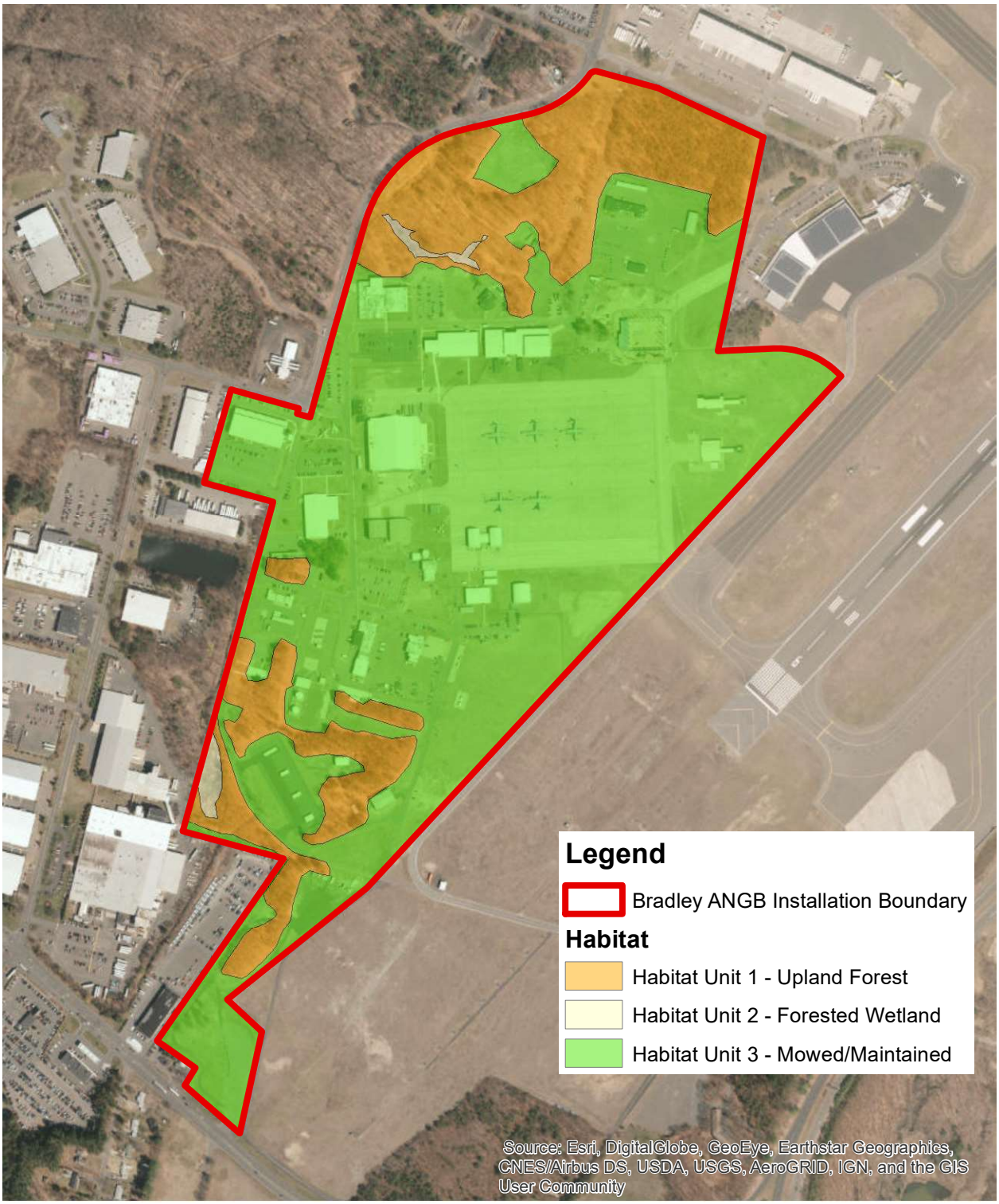
Scientific Name	Common Name	Scientific Name	Common Name
Ludwigia palustris	marsh seedbox, water purselane	*Veronica scutellata*	skullcap speedwell, marsh speedwell
Lycopodium complanatum	groundcedar	*Viburnum acerifolium*	mapleleaf viburnum
Maianthemum racemosum	false solomon's seal	*Viburnum dentatum*	southern arrowwood
Medeola virginiana	Indian cucumber	*Viburnum nudum* var.*cassinoides*	withe-rod
Medicago lupulina	black medick	*Viburnum prunifolium*	blackhaw
Morus rubra	red mulberry	*Viola arvensis*	field violet or european field pansy
Narcissus pseudonarcissus	daffodil	*Viola blanda*	sweet white violet
Nasturtium officinale	watercress	*Viola sororia*	common blue violet
Nyssa sylvatica	blackgum	*Viola* sp.	violet species
Onoclea sensibilis	sensitive fern	*Vitis riparia*	riverbank grape
Osmunda cinnamomea	cinnamon fern	*Yucca filamentosa*	Adam's needle
Oxalis montana	mountain woodsorrel		

Source: CTANG 2019a

Habitat 3 was the largest habitat at 118.5 acres and consisted of open, mowed areas or areas with ornamental landscaping. Mowed grasses included bermudagrass (*Cynodon dactylon*) and crabgrass (*Digitaria* spp.). Forbs included wintercress (*Barbarea vulgaris*), common dandelion (*Taraxacum officinale*), and English plantain (*Plantago lanceolata*). Little canopy was present, however, ornamental trees near office buildings included red oak, pitch pine, arborvitae (*Thuja occidentalis*), and Norway spruce. A total of 55 unique species were found in this habitat (CTANG 2019a).

Similar to Bradley ANGB, most of the Orange ANGS consists of paved and developed land. Vegetation surveys were completed in 2017 (Table 4). The area of review was described as having two habitat types (Figure 11; CTANG 2019b).

Habitat 1 encompassed 19.6 acres (7.93 hectares) and included 94 plant species, mostly herbaceous grasses and weeds in mowed areas. Dominant species observed included crown vetch (*Securigera varia*), common dandelion, English plantain, common plantain (*Plantago major*), red clover (*Trifolium pretense*), black medick (*Medicago lupulina*), and common groundsorrel (*Rumex acetosella*). Several stormwater basins and swales were also in this habitat type and contained weedy and wetland vegetation. Weedy vegetation included common reed, autumn olive (*Elaeagnus umbellate*), and switchgrass (*Panicum virgatum*) and wetland vegetation which included narrowleaf cattail (*Typha angustifolia*), green bulrush (*Scirpus atrovirens*), common rush (*Juncus effuses*), and fox sedge (*Carex vulpinoidea*; CTANG 2019b).



Source: CTANG. 2018. Final Flora and Fauna Surveys, Air National Guard-103rd Airlift Wing Bradley ANGB, East Granby, CT. Prepared for Headquarters Air National Guard, Joint Base Andrews, Maryland

ANGB - Air National Guard Base

0 300 600 900 Feet

Figure 10. Habitat Distribution at Bradley ANGB

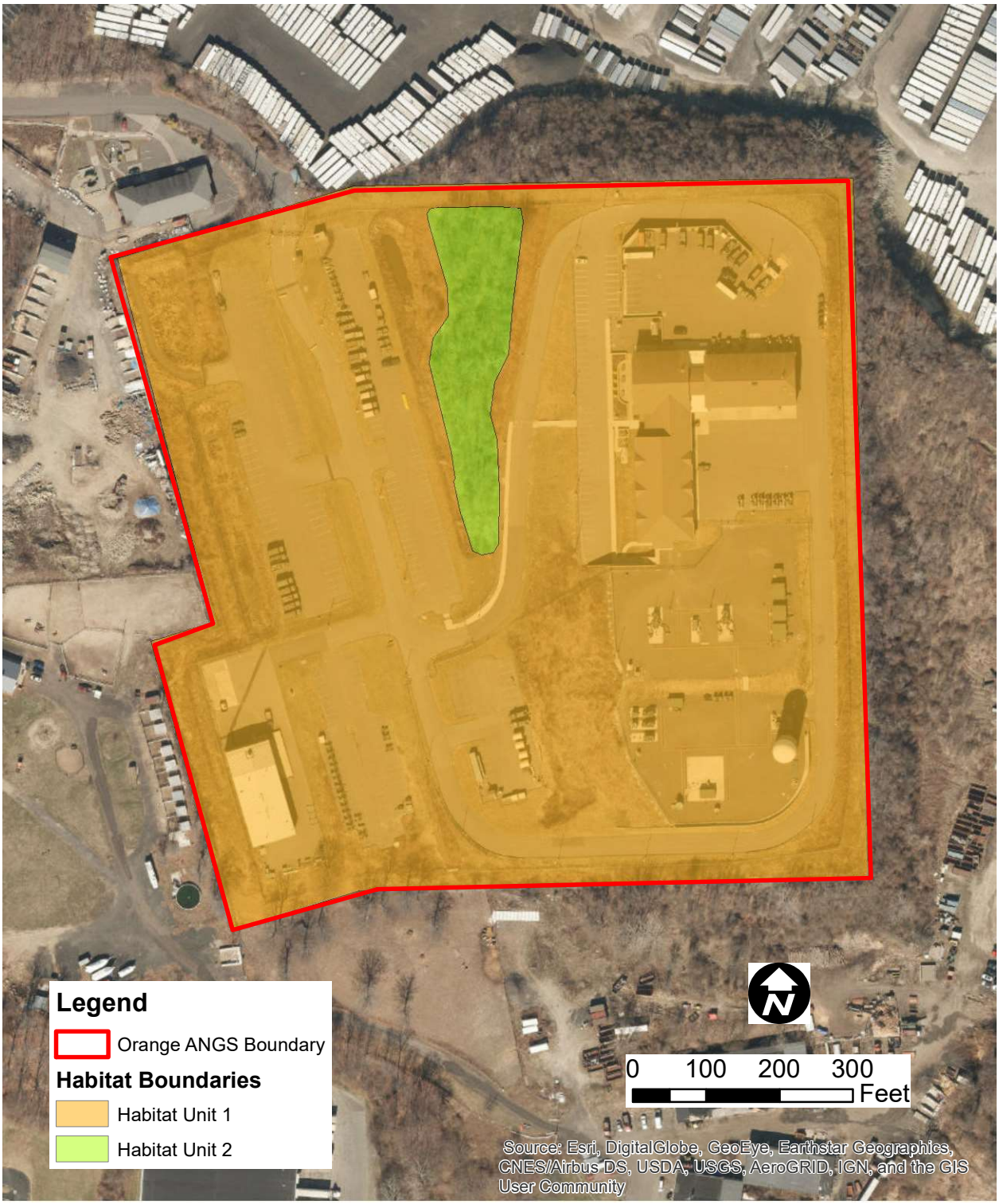
Habitat 2 totaled 0.9 acre (0.4 hectare) and included 45 species. The area consisted of herbaceous, dense shrub, and canopy layers. The forested canopy habitat contained red mulberry (*Morus rubra*), staghorn sumac (*Rhus typhina*), and common buckthorn (*Rhamnus cathartica*). The shrub layer contained Japanese honeysuckle (*Lonicera japonica*), bush honeysuckle (*Diervilla lonicera*), multiflora rose (*Rosa multiflora*), and oriental bittersweet (*Celastrus orbiculatus*).

Table 4. Vascular Plant Species at Orange ANGS

Scientific Name	Common Name	Scientific Name	Common Name
Acer platanoides	Norway maple	*Medicago lupulina*	black medick
Acer rubrum	red maple	*Morus rubra*	red mulberry
Alliaria petiolata	garlic mustard	*Nasturtium officinale*	watercress
Allium ascalonicum	wild onion	*Oxalis corniculata*	creeping woodsorrel
Alnus incana spp.rugosa	speckled alder	*Panicum virgatum*	switchgrass
Aquilegia canadensis	red or wild columbine	*Parthenocissus quinquefolia*	Virginia creeper
Arabis glabra	tower rockcress	*Phalaris arundinacea*	reed canarygrass
Artemisia vulgaris	common wormwood	*Phragmites australis*	common reed
Asclepias syriaca	common milkweed	*Phytolacca americana*	American pokeweed
Berberis thunbergii	Japanese barberry	*Plantago lanceolata*	narrowleaf plantain, English plantain
Betula nigra	river or black birch	*Plantago major*	common plantain
Cardamine pensylvanica	Pennsylvania bittercress	*Poa* sp.	blue grass species
Cardamine sp.	bittercress (no flower)	*Polygonum convolvulus*	black bindweed
Carex scirpoidea	northern singlespike sedge	*Polygonum cuspidatum*	Japanese knotweed
Carex vulpinoidea	fox sedge	*Polygonum* sp.	smartweed
Carya cordiformis	bitternut hickory	*Populus deltoides*	eastern cottonwood
Celastrus orbiculatus	oriental bittersweet	*Prunus serotina*	black cherry
Cerastium fontanum	common mouse-ear chickweed	*Quercus alba*	white oak
Chamaecyparis pisifera	sawara cypress	*Quercus palustris*	pin oak
Cirsium vulgare	bull thistle	*Quercus rubra*	red oak
Cornus sp.	dogwood	*Rhamnus cathartica*	common buckthorn
Cynodon dactylon	bermudagrass	*Rhododendron* sp. 1	azalea species
Daucus carota	queen Anne's lace	*Rhododendron* sp. 2	rhodondendron species
Didiplis diandra	waterpurslane	*Rhus glabra*	smooth sumac
Diervilla lonicera	bush honeysuckle	*Rhus typhina*	staghorn sumac
Digitaria sp.	crabgrass	*Robinia pseudoacacia*	black locust
Duchesnea indica	Indian strawberry	*Rosa 'Meijocos'*	red drift rose
Elaeagnus umbellata	autumn olive	*Rosa multiflora*	multiflora rose
Equisetum laevigatum	smooth horsetail	*Rosa radsunny*	sunny knockout rose (ornamental)
Euphorbia esula	leafy spurge	*Rubus occidentalis*	black raspberry
Fagus grandifolia	American beech	*Rumex acetosa*	garden sorrel
Festuca rubra	red fescue	*Rumex acetosella*	common sheep sorrel

Scientific Name	Common Name	Scientific Name	Common Name
Fraxinus pennsylvanica	green ash	*Rumex crispus*	curly dock
Gallium aparine	cleavers	*Salix cinerea*	large gray willow
Geranium maculatum	spotted or wild geranium	*Sassafras albidum*	sassafras
Geum aleppicum	yellow avens	*Schedonorus arundinaceus*	tall fescue
Glechoma hederacea	ground ivy	*Scirpus atrovirens*	green bulrush
Hedera helix	English ivy	*Securigera varia*	crownvetch
Hosta sp.	plantain lily	*Senecio vulgaris*	old-man-in-the-spring
Hyssopus officinialis	hyssop	*Silene latifolia* ssp. *alba*	bladder campeon
Impatiens capensis	jewelweed	*Smilax rotundifolia*	roundleaf greenbrier
Impatiens sp.	touch me not	*Solanum carolinense*	Carolina horsenettle
Juncus effusus	common rush	*Solanum* sp.	nightshade
Juniperus virginiana	eastern redcedar	*Solidago* sp.	goldenrod species
Lamium purpureum	purple deadnettle	*Taraxacum officinale*	common dandelion
Lemna sp.	duckweed	*Thlaspi arvense*	field pennycress
Lepidium virginicum	Virginia pepperweed	*Toxicodendron radicans*	eastern poison ivy
Leucanthemum vulgare	oxeye daisy	*Trifolium pratense*	red clover
Linaria vulgaris	butter and eggs	*Trillium erectum*	red trillium
Lindera benzoin	northern spicebush	*Typha angustifolia*	narrowleaf cattail
Liriodendron tulipifera	tuliptree or tulip poplar	*Typha latifolia*	broadleaf cattail
Lonicera japonica	Japanese honeysuckle	*Verbascum thapsus*	common mullein
Ludwigia palustris	marsh seedbox	*Veronica arvensis*	corn speedwell
Maianthemum racemosum	false solomon's seal	*Viola sororia*	common blue violet
Malus pumila	common or paradise apple	*Vitis riparia*	riverbank grape

Source: CTANG 2019b



Source: CTANG. 2018. Final Flora and Fauna Surveys, Air National Guard-103rd Air Control Squadron, Orange ANGS, Orange, Ct. Prepared for Headquarters Air National Guard, Joint Base Andrews, Maryland

ANGS - Air National Guard Station

Figure 11. Habitat Distribution at Orange ANGS

5.3 Fish and Wildlife

Hartford County's once dominant woodlands were home to a diverse collection of wildlife species, including black bears (*Ursus americanus*), elk (*Cervus canadensis*), mountain lions (*Puma concolor*), white-tailed deer (*Odocoileus virginianus*), quail (*Colinus virginianus*), grouse (*Bonasa umbellus*), timber wolves (*Canis lupus*), beavers (*Castor canadensis*), and wild turkeys (*Meleagris gallopavo*). These species gradually disappeared, initially as forests were cleared for agriculture, and later as the county began to experience urban growth. Today, most of the wildlife found in the county consists of species that have adapted to high levels of human activity and disturbance (CTANG 2018e). A survey of local fauna was conducted during the flora surveys of 2017 on Bradley ANGB; species observed on the installation are listed in Tables 5 through 7 (CTANG 2019a). In addition, bird species that pose a moderate to high risk (observed during the BASH survey of 2016 and from strike records from the area) are included in Table 5 (CTANG 2018a). No habitat for fish exists.

Based on recommendations from the CTDEEP (Dickson 2016), mist netting surveys for bats were not authorized. The reasons for this were two-fold. First, as a result of declines in cave bat species, eastern pipistrelles (*Perimyotis subflavus*), eastern small footed bat (*Myotis leibii*), little brown bat (*Myotis lucifugus*), northern long-eared bat (*Myotis septentrionalis*), and Indiana bats (*Myotis sodalist*), by as much as 90 percent since 2007-2008 due to white-nose syndrome (WNS), the potential to catch a cave bat species via mist net sampling is extremely low. Secondly, due to the low numbers of cave bats in Connecticut, there is concern about the physical impacts of mist net capture on a bat population already potentially weakened by exposure to WNS. The CTDEEP is avoiding the additional stress of mist net capture unless the underlying benefit outweighs the risk (Dickson 2016). Therefore, only passive acoustic monitoring for bats, following USFWS protocol, was used to provide data on the diversity of bats in the area since a permit was not issued by the state. The 2016 acoustic protocol for non-linear projects requires a minimum of four detector nights per 123 acres (0.5 square kilometer) of suitable summer habitat. Acoustical monitoring was conducted for 16 detector nights which exceeded the USFWS guideline recommendations. Bat surveys were conducted during 2016 and four species were detected (Table 6; CTANG 2019a).

Table 5. Bird Species Observed at Bradley ANGB

Scientific Name	Common Name	Scientific Name	Common Name
Accipiter cooperii	Cooper's hawk	*Eremophila alpestris*	horned lark
Accipiter striatus	sharp-shinned hawk	*Euphagus carolinus*	rusty blackbird
Actitis macularia	spotted sandpiper	*Falco columbarius*	merlin
*Agelaius phoeniceus**	red-winged blackbird	*Falco sparverius*	American kestrel
Aix sponsa	wood duck	*Fulica americana*	American coot
Anas americana	American wigeon	*Gavia immer*	Common Loon
Anas crecca	green-winged teal	*Gavia stellate*	red-throated loon
Anas platyrhynchos	mallard	*Haliaeetus leucocephalus*	bald eagle
Anas rubripes	American black duck	*Hirundo rustica**	barn swallow
Anas strepera	gadwall	*Larus argentatus*	herring gull
Ardea herodias	great blue heron	*Larus delawarensis*	ring-billed gull
Aythya collaris	ring-necked duck	*Larus marinus*	great black-backed gull
Bartramia longicauda	upland sandpiper	*Lophodytes cucullatus*	hooded merganser
Branta canadensis	Canada goose	*Meleagris gallopavo*	wild turkey
Bubo scandiacus	snowy owl	*Melanerpes carolinus**	red-bellied woodpecker

Scientific Name	Common Name	Scientific Name	Common Name
Bubo virginianus	great horned owl	*Melospiza melodia**	song sparrow
*Buteo jamaicensis**	red-tailed hawk	*Molothrus ater*	brown-headed cowbird
Buteo platypterus	broad-winged hawk	*Pandion haliaetus*	osprey
*Cardinalis cardinalis**	northern cardinal	*Phalacrocorax auratus*	double-crested cormorant
*Carduelis tristis**	American goldfinch	*Pipilo erthrophthalamus**	eastern towhee
*Carpodacus mexicanus**	house finch	*Plectrophenax nivalis*	snow bunting
Cathartes aura	turkey vulture	*Poecile atricapilla**	black-capped chickadee
Casmerodius albus	great egret	*Quiscalus quiscula**	common grackle
Charadrius vociferous	killdeer	*Strix varia*	barred owl
Chen caerulescens	snow goose	*Sturnus vulgaris*	European starling
Chordeiles minor	common nighthawk	*Tachycineta bicolor*	tree swallow
Circus cyaneus	northern harrier	*Tringa flavipes*	lesser yellowlegs
*Colaptes auratus**	northern flicker	*Tringa melanoleuca*	greater yellowlegs
*Columba livia**	rock dove	*Troglodytes aedon**	house wren
*Corvus brachyrhynchos**	American crow	*Turdus migratorius**	American robin
*Cyanocitta cristata**	blue jay	*Tyrannus tyrannus**	eastern kingbird
Cygnus olor	mute swan	*Zenaida macroura**	mourning dove
*Dumatella carolinensis**	gray catbird	*Zonotrichia leucophrys**	white-crowned sparrow

Source: CTANG 2018a and 2019a; asterisk (*) denotes a sighting from the most recent survey (CTANG 2019a).

Table 6. Mammal Species at Bradley ANGB

Scientific Name	Common Name	Scientific Name	Common Name
Canis latrans	coyote	*Castor canadensis*	beaver
Didelphis virginiana	Virginia opposum	*Eptesicus fuscus*	big brown bat
Lasiurus borealis	eastern red bat	*Lasiurus cinereus*	hoary bat
Lasionycteris noctivagans	silver-haired bat	*Lynx rufus*	bobcat
Mormota monax	woodchuck	*Ondatra zibethicus*	muskrat
Procyon lotor	raccoon	*Sciurus carolinensis*	eastern gray squirrel
Tamais striatus	eastern chipmunk	*Urocyon cinereoargenteus*	gray fox
Vulpes vulpes fulvus	American red fox		

Sources: CTANG 2019a; USDA 2019

Table 7. Herpetofauna Species at Bradley ANGB

Scientific Name	Common Name	Scientific Name	Common Name
Amphibians			
Chelydra serpentine	snapping turtle	*Chrsemys picta*	painted turtle
Thamnophis spp.	garter snake	*Rana clamitans*	green frog

Sources: CTANG 2019a; USDA 2019

The area surrounding Orange ANGS has lost many of its former species due to loss of habitat after urbanization (Hochholzer 2015). Fauna surveys were completed in 2017, in conjunction with the flora surveys; species observed on the installation are listed in Tables 8 through 10 (CTANG

2019b). Bat surveys were conducted during 2017 and four species were detected (Table 9; CTANG 2019b). No habitat for fish species exists on the installation.

Table 8. Bird Species at Orange ANGS

Scientific Name	Common Name	Scientific Name	Common Name
Agelaius phoeniceus	red-winged blackbird	*Pandion haliaetus*	osprey
Cardinalis cardinalis	northern cardinal	*Pipilo erythrophthalamus*	eastern towhee
Carduelis tristis	American goldfinch	*Quiscalus quiscula*	common grackle
Corvus corax	common raven	*Spizella passerina*	chipping sparrow
Dumatella carolinensis	gray catbird	*Sturnus vulgaris*	European starling
Hirundo rustica	barn swallow	*Turdus migratorius*	American robin
Larus sp.	gull species		

Source: CTANG 2019b

Table 9. Mammal Species at Orange ANGS

Scientific Name	Common Name	Scientific Name	Common Name
Canis latrans	coyote	*Marmota monax*	groundhog
Eptesicus fuscus	big brown bat	*Procyon lotor*	raccoon
Felis catus	feral cat	*Sciurus carolinensis*	eastern gray squirrel
Lasionycteris noctivagans	silver-haired bat	*Tamias striatus*	eastern chipmunk
Lasiurus borealis	eastern red bat		
Lasiurus cinereus	hoary bat		

Source: CTANG 2019b

Table 10. Herpetofauna Species at Orange ANGS

Scientific Name	Common Name	Scientific Name	Common Name
Reptiles			
Thamnophis sirtalis	eastern garter snake		

Source: CTANG 2019b

5.4 Threatened and Endangered Species and Species of Concern

Federal status as a threatened or endangered species is derived from the ESA of 1973 (16 USC §1531 et seq.) and administered, depending on the species, by the USFWS or the National Marine Fisheries Service (NMFS). No federally-listed species were detected on either Bradley ANGB or Orange ANGS during the 2016 and 2017 surveys. The federally-threatened northern long-eared bat (*Myotis septentrionalis*) may occur in New Haven and Hartford counties (USFWS 2019a and 2019b); however, no individuals were detected during targeted bat surveys on either installation (CTANG 2019a and 2019b).

State status as a threatened or endangered species in the state of Connecticut is determined by the CTDEEP under the Connecticut Endangered Species Act (CESA) of 1989. The CESA establishes an endangered, threatened, and special concern species list, which serves to identify species that need or could benefit from conservation, protection, restoration, or enhancement because they are declining as a result of the activities of mankind. The list is updated every five years to reflect

changes in federal legislation, the status of each species' population levels and habitats, and public comments (CTDEEP 2019a). The state of Connecticut currently lists 628 species as endangered, threatened, or of special concern (8 amphibians, 50 birds, 13 fish, 198 invertebrates, 14 mammals, 331 plants, and 14 reptiles; CTDEEP 2019a). The National Diversity Data Base map returned no results for Orange ANGS, however, three state-listed species have been documented on Bradley ANGB (CTDEEP 2018 and 2019a): the threatened pine barrens zanclognatha (*Zanclognatha martha*), the threatened scrub euchlaena (*Euchlaena madusaria*), and the state species of concern big sand tiger beetle (*Cicindela formosa generosa*). In addition, the Sand Barren Connecticut critical habitat has been documented adjacent to the installation.

During the 2017 survey, two state-listed plant species were documented on Bradley ANGB: the state endangered waterplantain spearwort (*Ranunculus ambigens*), and the state threatened blackhaw (*Viburnum prunifolium*). One species of special concern in Connecticut was also identified: the withe-rod (*Viburnum nudum* var. *cassinoides*; CTANG 2019a). This species is believed extirpated from natural areas (CTDEEP 2015b); however, it is commercially available and commonly used as a landscape species.

5.5 Waters of the US, Wetlands, and Floodplains

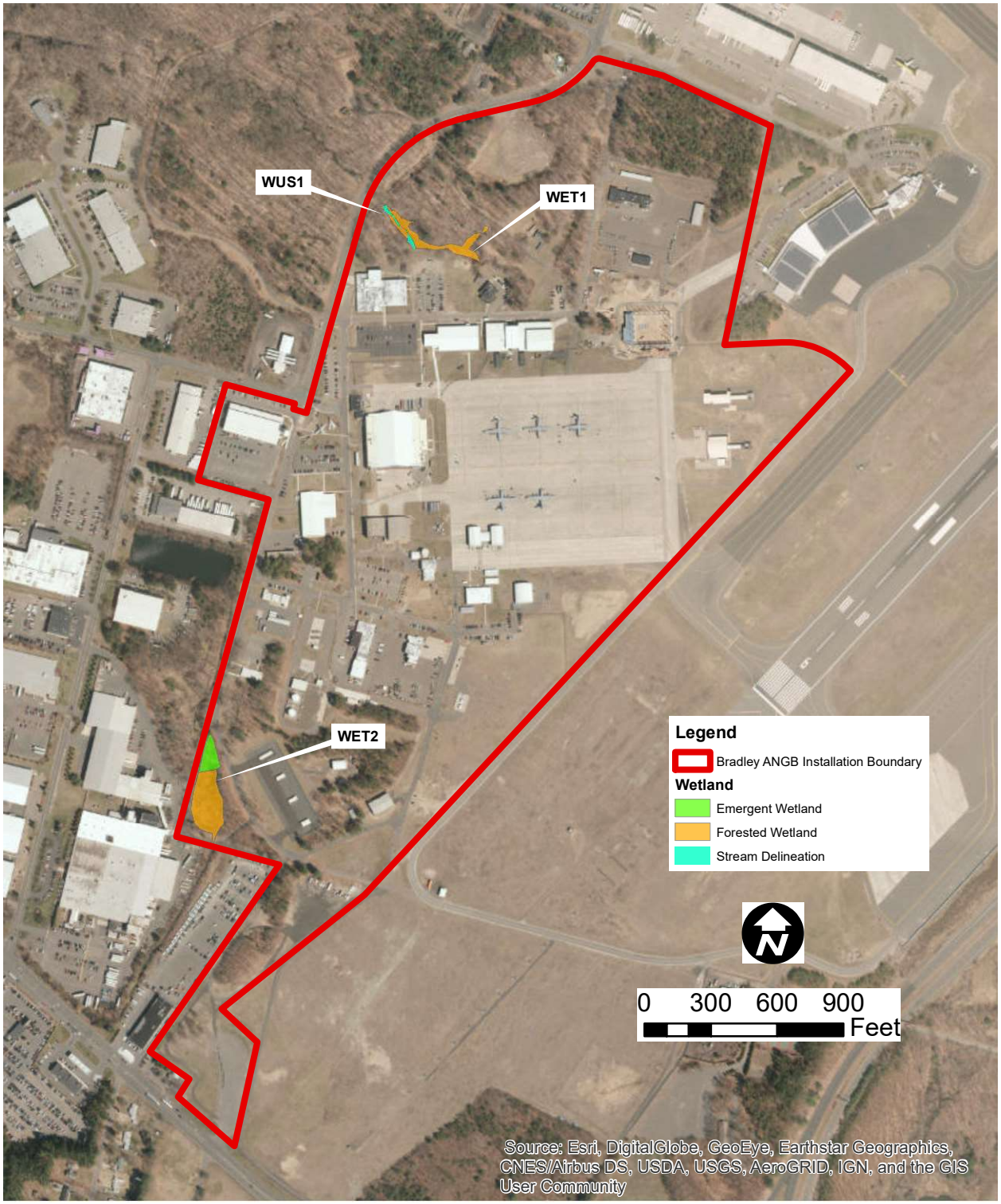
Surface waters at Bradley ANGB are limited to drainage ditches for stormwater runoff, as well as drainage basins that support the installation's industrial activity stormwater permit and discharge into nearby surface waters (CTANG 2018e). One stream was identified as a WOTUS during a review of the installation in 2017 (Figure 12; CTANG 2018f). The stream is behind Building 24 in the northern portion of the installation (WOTUS 1). Approximately 264 linear feet (80.5 meters) of the stream are within Bradley ANGB.

There are two wetlands based on a 2017 review and delineation of the installation (Figure 12; CTANG 2018f). Wetland 1 is to the northeast of Building 24 in the northern part of the installation. It is along the banks of the stream and is approximately 0.43 acre (0.17 hectare). Wetland 2 is in the southern portion of the installation, and continues offsite into DeGrayes Brook. Inside the installation, Wetland 2 encompasses approximately 1.0 acre (0.4 hectare). The US Army Corps of Engineers (USACE) concurred with the jurisdictional determination of the wetlands and WOTUS on Bradley ANGB.

A preliminary jurisdictional determination for Bradley ANGB was received from the USACE New England District on 8 March 2019. The preliminary jurisdiction states that wetlands as delineated are a reasonable representation of wetlands and waterways under the Clean Water Act (CWA). A preliminary jurisdictional determination is non-binding and only provides a written indication that WOTUS may be present (CTANG 2019c).

Bradley ANGB is not within the 100-year floodplain, although a small portion is in the 500-year floodplain. Wetland 1 has the potential to flood (FEMA 2008). The closest 100-year floodplain to Bradley ANGB is approximately 0.19 mile (0.3 kilometer) to the west of the installation – a portion of DeGrayes Brook and its tributaries.

Natural, open water bodies do not occur on or adjacent to Orange ANGS (CTANG 2006a). No WOTUS or wetlands were identified during a 2017 review and wetland delineation; however, several manmade stormwater retention systems were found (Figure 13; CTANG 2018g). Neither 100- nor 500-year floodplains exist on Orange ANGS (FEMA 2010). The closest 100-year floodplain to Orange ANGS is approximately 820 feet (0.25 kilometer) to the east of the installation where the Oyster River runs.



Source: CTANG. 2018. Draft Final Wetland Delineation Report, Air National Guard-103rd Airlift Wing Bradley ANGB, East Granby, CT. Prepared for Headquarters Air National Guard, Joint Base Andrews, Maryland

ANGB - Air National Guard Base

Figure 12. Waters of the US and wetlands on Bradley ANGB

Source: CTANG. 2018. Draft Final Wetland Delineation Report, Air National Guard-103rd Air Control Squadron, Orange ANGS, Orange, CT. Prepared for Headquarters Air National Guard, Joint Base Andrews, Maryland

ANGS - Air National Guard Station

Figure 13. Waters of the US and wetlands on Orange ANGS

6.0 MISSION IMPACTS ON NATURAL RESOURCES

6.1 Natural Resources Needed to Support the Military Mission

The Bradley ANGB requires operation areas to support cargo, passenger airlift, and medevac flying operations, aircraft re-fueling and maintenance, communication support, and surrounding areas to serve as a buffer to reduce BASH risk and provide support facilities and functions. The military mission and training requirements are dynamic and can change over time, requiring potential changes to natural resource needs to support the mission. Degradation of natural resources can result in unintended impacts to the military mission, impaired readiness, and increased expenses for natural resources management rather than the military mission. The Bradley ANGB needs the land and its natural resources to function together in a healthy ecosystem to support the military mission. Management activities in this INRMP are designed to support the desired habitats and ecosystem functions to meet the military mission.

6.2 Natural Resources Constraints to Mission and Mission Planning

The natural resources constraints to installation planning and mission are summarized as:

- Any project which is anticipated to impact WOTUS including wetlands must obtain a Section 404 Permit from the USACE and a Section 401 Water Quality Certification from CTDEEP. A delineation of the boundaries of all onsite WOTUS including wetlands must be completed in accordance with the policies and procedures defined under the Rivers and Harbors Act, 33 CFR Regulations part 328, the 1987 USACE Wetlands Delineation Manual, Technical Report Y-87-1, subsequent rules and guidelines issued governing its implementation and the applicable Regional Supplement to the 1987 USACE Wetlands Delineation Manual. Projects with impacts to wetlands must also undergo the NEPA process per 32 CFR Part 989 and be approved by NGB/A4VN NRPM.
- Any project that is anticipated to significantly impact floodplains must undergo the NEPA process per 32 CFR Part 989 and be approved by NGB/A4VN NRPM. Any project that permanently alters the hydrology of a floodplain may require a floodplain study to arrive at the correct elevations to meet state or local government regulations. If a study is required the installation will have to work directly with the state or local government agency responsible for the administration of floodplain laws and regulations.
- Bradley ANGB possesses populations of, and habitat features that are attractive to, high BASH threat species.

6.2.1 Land Use

The Bradley ANGB is located on approximately 145 acres of leased land and 3.9 acres of USAF-owned land within BIA's 2,385-acre complex. The parcel is located in the southwest part of BIA. Presently, Bradley ANGB consists of 38 buildings totaling over 300,000 square feet. The oldest buildings at the installation were constructed in 1958, while the newest buildings are from 1999. Most buildings were built after 1980 to accommodate the current mission (CTANG 2018d). Five structures occur at Orange ANGS for a total of 56,460 square feet and all were constructed after 1992 (CTANG 2017).

6.2.2 Current Major Impacts

The current major impacts to natural resources from the CTANG military mission include:

- Impacts to migratory birds (managed through the BASH Program)

- Impacts to tree biodiversity and forested habitat
- Impacts to water quality of Farmington and Connecticut rivers as well as contributing creeks: DeGrayes, Stony, Spencer, and Little brooks, and Seymour and Hathaway Hollows
- Impacts from Environmental Restoration Sites

6.2.2.1 Environmental Restoration Sites

The Environmental Restoration Program (ERP) was developed by the DoD to identify and address environmental contamination from past military operations. Future development of sites identified through the ERP might be constrained depending on the severity of the contamination or the extent of the remedial action required. The overall objective of the ERP is to identify potential environmental problems and provide timely remedies to protect public health and the environment.

There are two existing (and five closed) ERP sites at Bradley ANGB (Figure 14) and two sites currently going through closure at Orange ANGS (Figure 15) managed by CTANG.

Bradley ANGB - Environmental Restoration Program Site 1

ERP Site 1 is the former petroleum, oil, and lubricants fill stand area used for loading Jet Petroleum No. 4 (JP-4) fuel trucks prior to refueling operations on the aircraft parking apron. Three 25,000-gallon (95,000-liter) underground storage tanks and associated piping were in operation from 1956 until their removal in 1993. Small spills of JP-4 occurred in the general vicinity of the area (CTANG 2009).

A 2002 Remedial Investigation determined that site soils and groundwater were contaminated with volatile organic compounds, semivolatile organic compounds, and total petroleum hydrocarbons (CTANG 2009). Site remediation began in March 2006 with the installation of a horizontal well biosparge system (CTANG 2009). The biosparge system was turned off in summer 2008 after contamination was determined to be below regulatory action levels. A No Further Response Action Planned Decision Document would be issued if contamination remains below regulatory action levels for four consecutive quarters (CTANG 2009). CTANG is currently going through the well abandonment process for the site.

Bradley ANGB - Temporary Use Site 18 (Building 16)

Building 16 contains spills from hydraulic lifts. The site has been recommended for continual monitoring as well as an Environmental Land Use Restriction for natural attenuation within 15 years of funding in 2020.

Orange ANGS - Site 1 and Land Farm Area

ERP Site 1 is located at the top of Marsh Hill in the northeast section of the installation and consists of four areas of impacted soil. The site is approximately 1 acre (0.4 hectare) and was impacted by jet fuel from an underground storage tank. The Land Farm Area was located on the paved parking lot located east of Building 18 (CTANG 2006a). The area was used for onsite treatment of JP-4 impacted soils from Site 1. A Time-Critical Removal Action was performed to address the limited removal of soils impacted by petroleum hydrocarbons and lead at ERP Site 1. Remedial alternatives for Site 1 and the Former Land Farm Area in 2013 and 2014 consisted of groundwater long-term monitoring for arsenic.

0 150 300 450
Feet

Figure 14. ERP sites at Bradley ANGB

ANGB - Air National Guard Base
ERP - Environmental Restoration Program

Legend

Orange ANGS Boundary

Figure 15. ERP sites at Orange ANGS

ANGS - Air National Guard Station
ERP - Environmental Restoration Program

Orange ANGS - Site 2 (Front entry)

ERP Site 2 is located near the entrance in the northwest corner of the lower portion of Orange ANGS. This site is approximately 1 acre (0.4 hectare) and is the site of the former motor pool building and gasoline and diesel pump station. The site consists of three areas of impacted soil (Areas 2A, 2B, and 2C) as well as a former concrete pad (2CP). The Time-Critical Removal Action was performed because the installation was being demolished and rebuilt and the presence of contaminants of concern in surface and subsurface soil would have interfered with construction activities; soils removed were those likely to be encountered by construction workers during reconstruction (CTANG 2006a). Remedial alternatives for Site 2A, 2B, and 2CP in 2013 and 2014 consisted of groundwater long-term monitoring for arsenic and lead. Two phases of remedial action activities were conducted from 2013 to 2014 for Site 2C to reduce benzene concentrations in groundwater.

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

7.1 Natural Resources Program Management

The guiding philosophy of the CTANG INRMP is to take an ecosystems approach to managing natural resources. Ecosystem management is based on clearly stated goals and objectives, and associated projects. The CTANG INRMP identifies goals and objectives, and presents the means to accomplish them as well as the methodologies to monitor results.

7.2 Fish and Wildlife Management

Wildlife management involves manipulating various aspects of an ecosystem to benefit chosen wildlife species. Management of habitats generally is focused to benefit native species, particularly listed species and game species. Habitat management could be required to decrease the abundance of certain wildlife species or to reduce animal damage or bird strike hazards. The installation's limited size necessitates implementation of wildlife management options that do not increase the potential for wildlife mission conflicts but still conserve regional biodiversity. Wildlife population and habitat management on Bradley ANGB and Orange ANGS will (1) attempt to deter animals from foraging or roosting in areas near or adjacent to the flightline and other mission-critical areas, (2) attract wildlife to portions of the installation away from these areas, and (3) protect and conserve regional biodiversity through conservation of habitat corridors across the installation.

The installation supports a few native habitats, and a variety of native species as noted in wildlife surveys conducted in 2017, although the installation does not currently have a Wildlife Management Plan. The DoD and the ANG encourage support of SWAPs as part of a comprehensive installation natural resources program. The implementation of this INRMP and many of the proposed projects will support the goals of the Connecticut SWAP. The CESA (1989, Connecticut General Statutes Section 26-303) was enacted to conserve, protect, restore and enhance any endangered or threatened species and their essential habitat (CTDEEP 2019a). The status and listing of each species is reviewed every 5 years. The Connecticut SWAP identifies 10 key habitats for conservation planning.

7.2.1 Federal Wildlife Policies and Regulations

Endangered Species Act

The ESA of 1973, as amended (16 USC §1531 *et seq.*) provides for the identification and protection of threatened and endangered plants and animals, including their critical habitats. The ESA requires federal agencies to conserve threatened and endangered species and cooperate with state and local

authorities to resolve water resources issues in concert with the conservation of threatened and endangered species. This law establishes a consultation process involving federal agencies with input from state agencies to minimize impacts to the greatest extent practicable by agency action that would adversely affect species or habitat. Further, it prohibits all persons subject to U.S. jurisdiction from taking, including any harm or harassment, endangered or threatened species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits, unless permitted by regulations, the pursuit, hunting, take, capture, killing or attempting to take, capture, kill, or possess any migratory bird included in the MBTA, including any part, nest, or egg of any such bird (16 USC § 703). The DoD has a Memorandum of Understanding (MOU) with the USFWS pursuant to EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, which outlines a collaborative approach to promote the conservation of migratory bird populations. This MOU specifically pertains to natural resource management activities, including, but not limited to, habitat management, erosion control, forestry activities, invasive weed management, and prescribed burning. It also pertains to installation support functions, operation of industrial activities, construction and demolition activities, and hazardous waste cleanup. In February 2007, the USFWS finalized regulations for issuing incidental take permits to the DoD. If any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of migratory bird species, then they must confer and cooperate with the USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects (50 CFR Part 21).

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668-668c), enacted in 1940 and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof.”

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously-used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

7.2.2 Nuisance Wildlife and Wildlife Diseases

Bird species that pose a moderate to high risk identified in the installation’s BASH Plan (CTANG 2018a) are included in Table 5. Steps to reduce bird airstrikes are outlined and followed per the BASH guidelines. Aside from those species, there are few nuisance wildlife species at either installation. However, certain pests may transmit diseases, and the installation’s Public Health Officer should be available to provide consultation regarding any outbreaks (CTANG 2018b).

7.2.3 Management of Threatened and Endangered Species and Habitats

This section presents information about the management of priority species that are located within or have the potential to occur at Bradley ANGB or Orange ANGS, along with requirements and strategies for their management. As additional surveys and natural resources management activities are conducted, it is possible other species may be added in the future.

7.2.3.1 Federally-listed Special Status Wildlife Species

No federally-listed endangered or threatened species are known to occur within the vicinity of Bradley ANGB or Orange ANGS.

7.2.3.2 State Special Status Species

Six state-listed species of concern have been found on, or are known to occur near, Bradley ANGB. Three plant species were observed on site during the 2017 surveys. In addition, three wildlife species have the potential to occur on-site, and one rare habitat is adjacent to the installation. No state-listed species of concern have been documented or are known to occur at Orange ANGS.

Withe-rod: Wild-occurring populations of withe-rod (*Viburnum nudum* var.*cassinoides*) are believed extirpated in Connecticut, and are rare throughout New England (CBS 2015); however, the species was observed on-site in 2017 (CTANG 2019a). The specimen was found on the edge of the wetland areas in Habitat 2. The withe-rod (also known as possum-haw or wild raisin) inhabits thickets or swamps and can reach 11 feet (3.5 meters) in height (Figure 16). White, clustered flowers bloom from May to July (CBS 2015). Fruit development follows the flower bloom, and the flowers and berries provide food for wildlife. The withe-rod is native in the Northeast and is also used as an ornamental landscaping plant (Missouri Botanical Garden 2019a). The following management strategies for the withe-rod are recommended:

Figure 16. Withe-rod

Photo courtesy of Local Native Plant Database

- Preserve habitat
- Limit the use and disposal of pesticides and other chemicals near sensitive habitats
- Limit presence of off-road vehicles in known habitat as feasible

Waterplantain spearwort: The state-endangered waterplantain spearwort (*Ranunculus ambigens*) is found in ditches, streams, springs, creeks, ponds, and marshes (Figure 17). Yellow flowers bloom between May and August (Penskar and Crispin 2004; Flora of North America 2019). This species was identified in the large wetland in Habitat 2 on the southwest portion of Bradley ANGB. The following management strategies for the waterplantain spearwort are recommended:

- Preserve habitat
- Limit presence of off-road vehicles in known habitat as feasible

Figure 17. Waterplantain spearwort

Photo courtesy of Maryland Biodiversity Project

Blackhaw: The blackhaw (*Viburnum prunifolium*) is found in moist low to upland wood edges, thickets, streambanks, and roadsides. This species of special concern is typically around 13 feet (4-meters) tall and white flower clusters bloom April to June (Figure 18). The flowers are of special value to bees, and the fruit provides food for wildlife. The blackhaw is native in eastern and central North America and is used as an ornamental in landscaping (Lady Bird Johnson Wildflower Center 2013; Missouri Botanical Garden 2019b). This species was identified along the forested edge of the wetland of Habitat 2 near the existing gravel and paved roadways on the southwestern portion of Bradley ANGB. The following management strategies for the blackhaw are recommended:

Figure 18. Blackhaw

Photo courtesy of Missouri Botanical Garden

- Preserve habitat.
- Limit presence of off-road vehicles in known habitat as feasible.

Pine barrens zanclognatha: The state-threatened pine barrens (or Martha's) zanclognatha (*Zanclognatha martha*) is found in pitch pine-scrub oak barrens with plenty of leaf litter and canopy (Figure 19). The species has one brood per year, and they emerge in June/July. They appear to prefer plenty of shade and their larvae appear to forage on leaf litter/needles, although not much is known about the species. The following management strategies are recommended, if documented on Bradley ANGB (MASSWildlife 2015; New York Natural Heritage Program 2019a):

Figure 19. Pine barrens zanclognatha

Photo courtesy of mothphotographersgroup.msstate.edu

- Preserve preferred habitat, including pitch pine-scrub oak barrens
- Limit presence of off-road vehicles in known habitat as feasible

Scrub euchlaena moth: The state-threatened scrub (or sandplain) euchlaena moth (*Euchlaena madusaria*) is found in dry woodlands and scrublands, typically sandy areas containing low heath plants, such as lowbush blueberry (Figure 20). The species uses lowbush blueberry as well as other scrubland plants and trees as hosts for larvae. Two broods per year are normal, the first hatching in May/June, and the second in August/September (MASSWildlife 2012; New

Figure 20. Scrub euchlaena

Photo courtesy of mothphotographersgroup.msstate.edu

York Natural Heritage Program 2019b). The species has been documented on BIA habitat, and only two other locations in the state (Wagner 2015). The following management strategies are recommended, if documented on Bradley ANGB (MASSWildlife 2012; New York Natural Heritage Program 2019b):

- Preserve preferred habitat, including pitch pine, scrub oak, and lowbush blueberry
- Limit presence of off-road vehicles in known habitat as feasible
- Minimize lighting to preserve natural nighttime conditions

Big sand tiger beetle: The big sand tiger beetle (*Cicindela formosa generosa*; Figure 21) is found in small colonies in Windsor soil areas of Connecticut, including a few locations at BIA (Wagner 2015). This species of special concern prefers sand, clay, or shale soils in various habitats with sparse vegetation and loose sand, away from water sources. They emerge in the summer to feed and hibernate all winter in sand (Allen and Acciavatti 2002). The following management strategies are recommended, if documented on Bradley ANGB (Xerces Society for Invertebrate Conservation 2018):

- Avoid alteration of native sandy habitats as feasible
- Limit presence of off-road vehicles in known habitat as feasible

Figure 21. Big sand tiger beetle
Photo courtesy of sciencesource.com

Sand barren Connecticut critical habitat: Sand barren habitats are dry sandy deposits, remnants of glacial deposits. They are typically dominated by oaks, heaths, shrubs, grasses, and herbs. Soil in sand barrens is poor; therefore, not many species inhabit them. Several species of concern in Connecticut rely on sand barren habitat to survive. Sand barrens rely on disturbances such as fire, storms, or grazing for maintenance. They are ideal for places like BIA because they are flat and stable (Raleigh et al. 2003; Connecticut Woodlands 2016). The following management strategies are recommended:

- Avoid alteration of native sandy habitats as feasible
- Rotate disturbance events, such as mowing, to ensure habitat stays intact. Consult with the EM for activities in native sandy habitats.

7.2.3.3 Management Strategies for Special Status Species

In order to facilitate the continuation of the military mission and meet natural resource management objectives while reducing BASH issues and minimizing impacts to special status species, CTANG will:

- Update biological inventories regularly as the occurrence of listed species is subject to change over time as a result of either recruitment, responses to management activities, identification of additional protected species, or changes in the status of species currently present at Bradley ANGB and Orange ANGS.
- Maintain existing forested areas, grasslands, and wetlands, and minimize disturbance in riparian and wetland buffers.

- Continue supporting the BASH Program to minimize take of MBTA species.

7.3 Water and Wetland Resource Protection

Water resource protection is important to natural resources management because it directly affects surface water quality and the value of aquatic habitats. Wetlands, floodplains, and stream buffers are critical in the protection and maintenance of wildlife resources. CTANG currently protects its water resources through compliance with a number of federal, state, local, and USAF environmental regulations that require the installation to have detailed spill control and response procedures and to implement stormwater pollution prevention best management practices (BMPs). Surface waters at Bradley ANGB and Orange ANGS are limited to drainage ditches for stormwater runoff, as well as drainage basins that support the installation's industrial activity stormwater permit and discharge into nearby surface waters. The objective of these regulations is to prevent pollutants (e.g., fuels, solvents, sediments) from entering surface waters.

7.3.1 Regulatory and Permitting

The USACE regulates the discharge of dredged or fill material into WOTUS, including wetlands, under Section 404 of the CWA. Even an inadvertent encroachment into WOTUS, including wetlands, resulting in a displacement or movement of soil or fill material has the potential to be viewed as a violation of the CWA if an appropriate permit has not been issued by the USACE. WOTUS, including wetlands, are defined under 33 CFR Part 328.3(a) and are referred to as Jurisdictional Waters.

Jurisdictional Waters may include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, wetlands, and other waters, that if degraded or destroyed could affect interstate commerce.

Management of wetlands on federal lands and military installations is further governed by EO 11990 and DoDI 4715.03, respectively. Under those instructions, wetlands are required to be managed for no net loss on federal lands, including military installations. In support of these policies, long- and short-term adverse impacts associated with the destruction or modification of wetlands and support of new construction in wetlands must be avoided to the maximum extent possible.

In Connecticut, the USACE shares jurisdictional authority with the state to regulate wetlands and "Waters of the US". The Inlands Wetlands and Watercourses Act [Sections 22a-36 through 22a-45 of the General Statutes of Connecticut] protects wetlands and the public interests they serve, including flood control, prevention of pollution and storm damage, and protection of public and private water supplies, groundwater supply, fisheries, land containing shellfish, and wildlife habitat. These public interests are protected by requiring a careful review of proposed work that could alter wetlands. The law protects not only wetlands, but other resource areas, such as land subject to flooding (100-year floodplains), the riverfront area (added by the Rivers Protection Act), and watercourses including waterways, lakes, ponds, marshes, and swamps. Any potential wetland disturbance must include the proper delineation per CTDEEP regulation. For any potential wetland disturbance, the installation must submit a notice of intent to CTDEEP and the USACE.

According to the US Environmental Protection Agency (USEPA) regulations issued under Section 404(b)(1) of the CWA, permitting of fill activities will not be approved unless the following conditions are met: no practicable, less environmentally damaging alternative to the action exists; the activity does not cause or contribute to violations of state water quality standards (or compliance under Section 401 of the CWA); the activity does not jeopardize listed species or sensitive cultural resources (33 CFR Part 320.3 [e] and [g]); the activity does not contribute to significant degradation

of WOTUS; and all practicable and appropriate steps have been taken to minimize potential adverse impacts to the aquatic ecosystem (40 CFR Part 230.10). Under Section 401 of the federal CWA, activities proposing discharges to water bodies or wetlands require a Water Quality Certification.

EO 11988, *Floodplains Management*, requires all federal agencies to provide leadership and take action to reduce the risk of floodplain loss; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands.

In addition, if action is taken that permits an encroachment within the floodplain that alters the flood hazards on a Federal Insurance Rate Map (FIRM) (e.g., changes to the floodplain boundary), CTANG must submit an analysis reflecting those changes to Federal Emergency Management Agency (FEMA). FEMA headquarters can be contacted at 202-646-3461 to obtain booklet MT-2, Revisions to National Flood Insurance Program Maps, for further guidance. Floodplains are also protected under East Granby's zoning regulations (East Granby 1996).

This INRMP focuses mainly on the potential impacts to water resources related to ground disturbance and stormwater associated with changes in impervious areas. Specific watershed protection measures used by the installation include:

- Adhere to a 75-foot (23-meter) set back from all wetlands on the installation.
- Manage invasive species to promote desirable native species.
- Implement CTDEEP National Pollutant Discharge Elimination System (NPDES) general stormwater permit (Permit No. GSI000934) for industrial stormwater at Bradley ANGB and Orange ANGS (Permit No.GSI001590), effective from 16 June 2011 through 30 September 2020.
- Implement SWPPP, which provides engineering and management strategies designed to improve the quality of stormwater runoff from the installations and thereby improve the quality of receiving waters.
- Obtain *Construction General Permit for Discharge of Stormwater and Dewatering Wastewaters* (Section 22a-430b of the Connecticut General Statutes) for construction that disturbs greater than 1 acre (0.4 hectare). Ensure BMPs designated under the regulations are implemented.
- Consult with the EM prior to initiating projects, including any tree clearance.
- When impacts to waters including wetlands cannot be avoided, apply for and obtain a Section 404 permit and Section 401 water quality certification/permit prior to the commencement of any land disturbance. Mitigation may be required for the loss of acreage.

7.3.2 Coastal Management Zones

The Connecticut Coastal Management Act (CCMA) is administered by CTDEEP and balances the growth along the coast with the restoration of coastal habitat and protection of water-dependent users (CTDEEP 2019b). Although the Town of Orange is identified within the Connecticut Coastal Area, the Orange ANGS itself does not lie within the coastal boundary. Construction projects conducted at the ANGS therefore are not subject to review by the planning commission to determine the effects on coastal resources.

7.3.3 Vegetation Buffers

Vegetative buffers (e.g., grass filter strips, forested buffers) improve stormwater runoff quality by slowing down the rate of flow, trapping sediment and other pollutants, and increasing infiltration into the ground. The Orange ANGS maintains buffers around the installation's perimeter to the extent practical (CTANG 2006a) and Bradley ANGB around wetlands and streams (CTANG 2006b).

7.4 Grounds Maintenance

Bradley ANGB currently occupies approximately 144 acres (58.3 hectares) of land and about half of this land is developed. The grounds maintenance personnel currently mow the grass in the maintained areas of the installation and conduct tree maintenance. Ground maintenance is also conducted on Orange ANGS. It is recommended that the installation move toward the use of more native plants that require less maintenance inputs in terms of energy, water, manpower, equipment, and chemicals. The implementation of this goal will satisfy Sec. 207 of EO 13148 which requests agencies to strive to promote the sustainable management of federal facility lands through the implementation of cost- effective, environmentally-sound landscaping practices, and programs to reduce adverse impacts to the natural environment. All ground maintenance activities will ensure compliance with environmental legislation, regulations, and guidelines. General recommendations to promote environmentally beneficial landscaping include:

- Maximize use of regionally native plant species and avoid introduction of invasive, nonnative species in revegetation and landscaping activities.
- Where feasible, include rain gardens.
- Implement water-efficient practices, use efficient irrigation systems and recycled water, and use landscaping to conserve energy.
- Design landscaping to be suitable to the specific site and appropriate for the use and operation of the facility.

7.5 Forest Management

Forest lands on Bradley ANGB are minimal; therefore, there is no formal management program in place. Forest lands will be managed with the overall goal of supporting the installation ecosystem and resources. Future projects may include the development of a forestry management plan. CTANG will avoid removing trees during nesting season.

7.6 Soil Conservation and Sediment Management

The soils on both installations are susceptible to water erosion if not protected with vegetation or other cover. Maintenance of key ecosystem functions, such as erosion control and sediment retention, require a healthy, uniform ground cover be established as quickly as possible following land use conversion or disturbance, and that interim soil stabilization measures be implemented. Sites where soils are exposed to environmental variables (i.e., water, wind, and ice) can have erosion and sedimentation problems. Sedimentation occurs when soil particles are suspended in surface runoff or wind and are deposited in streams or other water bodies. Sediments affect water clarity, decrease oxygen levels in water, and transport pollutants. Construction activities that disturb the ground surface can accelerate erosion by removing vegetation, compacting or disturbing the soil, changing natural drainage patterns, and by covering the ground with impermeable surfaces (pavement, concrete, buildings). When the land surface is impermeable, stormwater can no longer infiltrate, resulting in larger amounts of water that can move more quickly across a site and which

can carry larger amounts of sediment and other pollutants into stormwater drains and drainage basins and ultimately into streams and rivers. As soil quality declines, adverse impacts to on-site and off-site environments increase. Therefore, the maintenance of soil quality is important for efficient and productive land management and utilization. Soil drainage, texture, strength, and erodibility all determine the suitability of the ground to support man-made structures, facilities, and military activities. The plan for water resources at Bradley ANGB and Orange ANGS specifically focuses on stormwater drainage and retention.

The Bradley ANGB and Orange ANGS operate under a NPDES, which provides engineering and management strategies designed to improve the quality of stormwater runoff from the installations and thereby improve the quality of receiving waters. Construction activities that disturb one or more acres are regulated under Connecticut's NPDES construction stormwater program and would need a Construction General Permit. To protect water quality, CTANG implements the following strategies:

- Monitor surface water quality.
- Implement BMPs for construction and industrial activities.
- Prevent surface water pollution by ensuring environmental plans (e.g. SWPPP) are implemented (e.g. capture and treatment of deicing fluid runoff).
- Minimize the use of pesticides.
- Maintain vegetation buffers around water resources.
- Re-seed disturbed areas after construction.

7.7 Outdoor Recreation, Public Access, and Public Outreach

Due to security and/or safety measures, there is currently no unsupervised public access or individual public access programs for outdoor recreation or otherwise at Bradley ANGB or Orange ANGS. Recreational opportunities such as a running track are available to installation personnel.

7.8 Conservation Law Enforcement

No hunting or fishing is allowed on the installation; therefore, conservation law enforcement officers are not necessary.

7.9 Geographic Information Systems

Geographic Information System (GIS) is used to manage and catalog information acquired in natural resources research. GIS assists in planning by charting areas of environmental concern and providing a baseline for analyzing the potential impacts of any proposed natural resources management action. Managers can implement the capabilities of a GIS to watershed, wetlands, wildlife, and various other natural resource management applications. GIS needs and requirements will be addressed through the ANG GeoBase Program.

7.10 Other Plans

7.10.1 Integrated Pest Management Plan

Both Bradley ANGB and Orange ANGS follow IPM plans in an effort to control organisms that negatively influence human health or the environment while using sustainable practices (CTANG 2018b). The plan aims for non-chemical pest removal when possible. Strategies include mowing

and frequently removing waste to eliminate rodent habitat and food sources. Removing invasive species at installation boundaries is key to keep plants from encroaching inward. Pesticide application is conducted by a licensed professional, and the two wetlands on the installation (see Section 5.5) are avoided. Currently, the installations control for rats, mice, cockroaches, bees, ground hornets, wasps, ants, and broadleaf weeds. Additionally, Orange ANGS treats the stormwater retention systems for algae (CTANG 2018b).

7.10.2 Invasive Species

Non-native, invasive, and pest species have the potential to be a major contributor to ecosystem destabilization. Non-native species (also termed exotic), as the name indicates, are species from other regions of the world which have been artificially introduced to the region, primarily through human activities. Invasive species are those that, whether native or non-native, tend to become established in disturbed systems and competitively exclude native species. Invasive plant species should be eradicated to prevent further spread and infestation. Information on invasive species in Connecticut can be found from various sources:

- CTDEEP - Invasive Species. https://www.ct.gov/deep/cwp/view.asp?q=323494
- University of Connecticut, Connecticut Invasive Plant Working Group. https://www.cipwg.uconn.edu
- US Department of Agriculture's (USDA's) Introduced, Invasive and Noxious Plants: http://plants.usda.gov/java/noxious?rptType=State&statefips=23

The Connecticut Introduced Pests Outreach Project is an educational component of the Cooperative Agricultural Pest Survey Program. This project is a collaborative effort between the Connecticut Department of Agricultural Resources and University of Connecticut Extension Agriculture and Landscape Program, and is funded by the USDA/Animal and Plant Health Inspection Service. Additional information on invasive species and management programs can be obtained from this group.

EO 13112, *Invasive Species*, requires all federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. Bradley's IPM Plan (CTANG 2018b) details the control of pest species as well as identification of all invasive species found on the base (Table 11). Several of the species found on both installations are prohibited under the Connecticut General Statute §22a-381d.

Table 11. Invasive Plant Species Identified at Bradley ANGB and Orange ANGS

Scientific Name	Common Name	Prohibited under Statute[2]	Location
Acer platanoides	Norway maple	No	Bradley, Orange
Berberis thunbergii	Japanese barberry	No	Bradley, Orange
Alliaria petiolata	Garlic mustard	Yes	Orange
Celastrus orbiculatus	Oriental bittersweet	Yes	Bradley, Orange
Elaeagnus umbellata	Autumn olive	No	Bradley, Orange
Artemisia vulgaris	Common wormwood	No	Orange
Euphorbia esula	Leafy spurge	Yes	Orange
Glechoma hederacea	Ground ivy	Yes	Orange
Lonicera japonica	Japanese honeysuckle	Yes	Orange
Nasturtium officinale[1]	Watercress	Yes	Bradley, Orange

Scientific Name	Common Name	Prohibited under Statute[2]	Location
Phalaris arundinacea	Reed canarygrass	No	Bradley, Orange
Phragmites australis	Common reed	Yes	Bradley, Orange
Polygonum cuspidatum	Japanese knotweed	No	Bradley, Orange
Rhamnus cathartica	Common buckthorn	Yes	Orange
Robinia pseudoacacia	Black locust	No	Bradley
Rosa multiflora	Multiflora rose	Yes	Bradley, Orange
Rumex acetosella	Common sheep sorrel	Yes	Orange

Sources: CTANG 2018b; CT Invasive Plants Council 2014; CTDEEP 2017
[1]Potentially invasive
[2]Species that are prohibited from importation, movement, sale, purchase, transplanting, cultivation and distribution under CT Gen. Stat. §22a-381d

Pest species are typically non-native species that have negative impacts on natural ecosystems or on human health. The goals of the IPM Plan are to establish and maintain safe, effective, and environmentally sound IPM practices to control pests that may adversely impact readiness of military operations by affecting the health of personnel or damaging structures, material, or property. Management strategies outlined for implementation of this INRMP are to ensure no net loss of military training capabilities. General management strategies are as follows:

- Control invasive and exotic species and noxious weeds through early detection and isolation of infested areas.
- Establish and maintain systematic and pest-specific surveillance and monitoring programs (including termite inspection frequency) to determine the status of pest presence at the installation and if and when treatments are needed rather than by a predetermined schedule.
- Implement BMPs to minimize land disturbances that favor invasion of non-native species and re-vegetate disturbed areas with native species.
- Avoid pesticide use in and around wetlands and other surface waters.
- Do not use invasive, non-native species in landscaping.
- Implement judicious use of both non-chemical and chemical control techniques to achieve effective pest management that minimizes economic, health, and environmental risks. Emphasize the use of mechanical, biological, and cultural control techniques, using chemical techniques sparingly with caution. Use chemical controls only after careful consideration of alternative controls.
- Educate site users.
- Ensure all pest management operations involving the application of pesticides on the installation are performed by DoD or state certified Pesticide Applicators and by licensed commercial pest management companies.
- Ensure pesticides used at Bradley ANGB are stored in accordance with the product labels, their Safety Data Sheets, and in accordance with DoDI 4150.07, federal, state, and local regulations.
- Ensure the IPMC monitors contracts for pest management at Bradley ANGB.

7.10.3 Stormwater Management

The state of Connecticut has legal authority to implement and enforce the provisions of the CWA, while the USEPA retains oversight responsibilities. CTDEEP issued an NPDES industrial stormwater permit (Permit No.GSI000934) for industrial stormwater at Bradley ANGB effective from 16 June 2011 through 30 September 2021 and Orange ANGS (Permit No.GSI001590) effective 16 June 2011 through 30 September 2021. The Bradley ANGB and Orange ANGS also operate under SWPPPs, which provide engineering and management strategies designed to improve the quality of stormwater runoff from the installations and thereby improve the quality of receiving waters (CTANG 2006a and 2006b). A Connecticut Construction General Permit for discharge of stormwater and dewatering wastewaters from construction activities that disturbs greater than 1 acre is required from CTDEEP.

7.10.4 Bird/Wildlife Aircraft Strike Hazard

A BASH exists at Bradley ANGB at BIA and its vicinity, due to resident and migratory bird species and other wildlife. Daily and seasonal bird movements create various hazardous conditions. The BASH Plan (CTANG 2018a) establishes procedures to minimize the hazard to the Bradley ANGB and deployed aircraft at the installation and in their operating areas.

Civilian movements at the BIA account for approximately 98,000 movements and the military for 1,450 movements annually. In 2019, there were 41 total wildlife strikes recorded (USDA-WS 2019) with 11 strikes due to unknown species, four strikes occurring due to bat species, one insect strike, and the rest attributed to avian species. Of these strikes, only three strikes, all non-damaging, occurred with military aircraft, and the rest including one damaging strike, were civilian.

Animal and bird populations, both migratory and resident populations, on the flightline area will be controlled to prevent wildlife/aircraft collisions. This will be accomplished by habitat modification, fence maintenance around the flightline, noise and distress calls, and as a last resort, depredation by the USDA-WS. Flightline vegetation will be maintained between 7 and 14 inches (18 and 36 centimeters) in height to discourage birds and limit the number of mowings required. The BASH Plan covers procedures and techniques for preventing bird aircraft strikes and hazards.

7.10.5 Connecticut Wildlife Action Plan

During the INRMP development process, the CTANG consulted with the CTDEEP to ensure INRMP goals, objectives, and strategies are consistent with Connecticut's overall statewide and habitat-specific plans. The 2015 SWAP provides CTDEEP with important tools for restoring and maintaining critical habitats and populations of the state's species of conservation and management concern as well as conserving Connecticut's wildlife diversity (CTDEEP 2015a).

8.0 MANAGEMENT GOALS AND OBJECTIVES

Goals and objectives provide the framework for natural resources management programs. Goals provide a general guiding direction for each technical area and objectives are more specific actions that facilitate achieving those goals. The objectives then drive the development of specific activities and projects to achieve those objectives. Management goals and objectives for the CTANG INRMP were developed through a thorough evaluation of the natural resources present on Bradley ANGB and Orange ANGS in accordance with AFMAN 32-7003 and the principles of adaptive ecosystem management by an interdisciplinary team of biologists, planners, and environmental scientists. Goals and objectives should be revised over time to reflect evolving environmental conditions, adaptive management, and the completion of tasks as the CTANG INRMP is implemented.

GOAL – Natural Resources Program Management (PM): Promote discussion with installation Command, personnel, and pertinent stakeholders to define, refine, and monitor the ecosystem management vision for the installation and to manage natural resources in a manner that is compatible with, and supports the military mission while complying with applicable federal and state laws, and USAF regulations and policies.

- OBJECTIVE PM1: Coordinate a yearly meeting of the INRMP Working Group to identify operational needs relative to natural resources management. The Working Group should monitor the progress in reaching INRMP goals and objectives, and discuss potential operational changes that could impact those goals and objectives. Document the meetings with the ANG.
- OBJECTIVE PM2: Facilitate integration of the approved INRMP into the Master Plan, and other operational plans including evolving airfield safety requirements.
- OBJECTIVE PM3: Develop educational materials that describe ecosystem management, natural resources, and operational policies for use in training installation personnel and visiting units.
    - Determine feasibility of implementing Earth Day and National Arbor Day activities.
    - Determine feasibility of working with Civil Air Patrol, Boy Scouts, Girl Scouts and other similar organizations for implementing natural resources management projects on the installation.
- OBJECTIVE PM4: Determine feasibility of establishing ecosystem-based land management partnerships with landowners immediately adjacent to the installation.
- OBJECTIVE PM5: Annually prepare the budget to implement the next fiscal year's actions.

GOAL – Fish and Wildlife Monitoring (FW): Establish a general wildlife and plant population trend monitoring program as a component of long-term ecological trend monitoring.

- OBJECTIVE FW1: Every 3-5 years, update the biological surveys conducted on the installation as a means to monitor and track significant wildlife populations.
- OBJECTIVE FW2: Maintain an updated inventory of plants and animals present on Bradley ANGB and Orange ANGS.
    - Monitor species or communities that are components of prey habitat or indicators of ecosystem integrity, status of sensitive species, and maintain the capability of Bradley ANGB to support military missions. Monitor species identified as possibly occurring on the installation by the CTDEEP.
- OBJECTIVE FW3: Support the Connecticut SWAP.
    - Identify possible areas where the installation could support wildlife conservation projects in cooperation with the goals and objectives of the SWAP.
    - Conduct surveys to identify the species inhabiting onsite WOTUS and wetland areas including, but not limited to, the Jefferson salamander (*Ambystoma jeffersonianum*), marbled salamander *(Ambystoma opacum)*, four-toed salamander (*Hemidactylium scutatum*), eastern spadefoot (*Scaphiopus holbrookii*), Eastern box turtle (*Terrapene carolina*) and spotted turtle (*Clemmys guttata*).

  - Conduct surveys to identify the species inhabiting upland/young/riparian forests, including but not limited to, the sharp-shinned hawk (*Accipiter striatus*), blackpoll warbler (*Dendroica striata*), willow flycatcher (*Empidonax traillii*), wood thrush (*Hylocichla mustelina*), Northern parula (*Parula americana*), brown thrasher (*Toxostoma rufum*), blue-winged warbler (*Vermivora pinus*) and Canada warbler (*Wilsonia canadensis*).

- OBJECTIVE FW4: Determine the feasibility for implementing DoD supported conservation programs such as the Partners in Flight Program, Watchable Wildlife Program, and Partners in Amphibian and Reptile Conservation Program.
- OBJECTIVE FW5: In cooperation with the Safety Office and the USDA Wildlife Specialist, minimize impacts on migratory birds that may be caused by day to day operations of the installation.
  - Conduct surveys to identify population numbers of migratory birds during fall and spring migration.
  - Conduct an initial power line and poll survey to identify ones that could be bird electrocution hazards. Determine what mitigating measures could be implemented to reduce any hazards found and how often this survey should be conducted.
  - Work with installation grounds maintenance personnel and electrical service personnel to install agreed upon mitigating measures in accordance with equipment and procedures identified by the Avian Power Line Interaction Committee (APLIC 2006) or more recent documents.
  - Determine and implement a review protocol to evaluate all new power poles to ensure electrocution hazards are minimized to the greatest extent practicable.
- OBJECTIVE FW6: Manage habitats proximal to mission-critical areas to minimize BASH potential, while conserving regional biodiversity and maintaining the structural and functional integrity of the regional ecosystem.
  - Support the Safety Office, the USDA Wildlife Specialist and the IPMC with implementation of the BASH Plan. Attend quarterly BASH meetings.
  - Review the Wildlife Hazard Assessment Report/Plan and the BASH Plan to ensure the objectives and goals of the Report/Plan are not in conflict with the goals and objectives of the INRMP and the IPM Plan.
  - Review quarterly Depredation Reports completed by the USDA Wildlife Specialist.
- OBJECTIVE FW7: Based on the results of the Final Flora and Fauna Surveys (CTANG 2019a and 2019b) for both Bradley ANGB and Orange ANGS, determine if additional surveys are needed and what actions are warranted to address herpetofauna species.

GOAL – Vegetative Management (VM): Establish survey and monitoring programs to identify and address various vegetative communities on the installation.

- OBJECTIVE VM1: Based on the results of the Final Flora and Fauna Surveys (CTANG 2019a and 2019b) for both Bradley ANGB and Orange ANGS, determine what actions are needed to address the presence of non-native, invasive and noxious species on the installation.

- OBJECTIVE VM2: Survey the extent of the riparian habitat/corridors on the installation. Determine what if any protective measures could be implemented that will not conflict with the flying mission of the installation and the BIA.
- OBJECTIVE VM3: Based on the results of the Final Flora and Fauna Surveys (CTANG 2019a and 2019b) for both Bradley ANGB and Orange ANGS, determine if additional surveys are needed for listed plant species and what actions are warranted to address their presence.
- OBJECTIVE VM4: Conduct a tree inventory to identify tree species and their locations on the installation.
    - Determine the feasibility of creating and implementing a tree conservation program for the installation.
    - Develop a Greenhouse Gas Management Plan which includes a greenhouse gas inventory, greenhouse gas reduction targets, adaptive and mitigation measures, and a monitoring program. As part of the plan, calculate the installation's carbon footprint using the Nature Conservancy's carbon calculator (*http://www.nature.org/greenliving/carboncalculator/index.htm*)

GOAL – Threatened and Endangered Species (TE): Identify the presence of federally and state threatened and endangered species to include any Species of Greatest Conservation Need identified in Connecticut's SWAP.

- OBJECTIVE TE1: Using the Final Flora and Fauna Surveys (CTANG 2019a and 2019b) for Bradley ANGB and Orange ANGS, as well as state and federal sites identifying state- and federally-listed species, determine what additional survey work and actions may be needed to protect and conserve onsite federally- and state-listed species.
- OBJECTIVE TE2: Annually review state and federal lists of endangered, threatened and species of concern with potential to occur on the installations. Maintain current lists of federal and state species.
- OBJECTIVE TE3: Develop and implement management actions to protect and enhance identified rare species and their habitats including sandy habitats.

GOAL – Grounds Maintenance and Landscaping (GM): Manage vegetative cover, forested areas, and soil to minimize sediment loss and erosion, while protecting water quality.

- OBJECTIVE GM1: Develop and implement a revegetation plan, with interim mechanisms to stabilize the soil until vegetative cover has become established, to reclaim disturbed areas following land use conversion, timber harvest, and other disturbances.
    - Use appropriate native seed mixtures and flora on new landscaping projects and disturbed areas.
    - Monitor revegetation efforts for effectiveness and modify as needed.
- OBJECTIVE GM2: Develop a Native Landscaping Plan and ensure that new landscaping projects use native materials. A list of native plant species suitable for use at the installation is available from the EM**.**

  - Establish and maintain a mixture of native grasses in the open/airfield areas and keep them mowed to within the 7- to 14-inch (18- to 36-centimeter) height range required in the BASH Plan.
  - Conduct training sessions to educate personnel of native plant usage.

- OBJECTIVE GM3: Implement safe mowing practices to reduce mortality to herpetofauna and other wildlife while also complying with the BASH Plan.
  - Increase the deck height of a mower to 10 to 12 inches (25 to 30 centimeters) to reduce the potential for herpetofaunal run-ins with blades.
  - When possible, begin mowing at the center of a treatment area, progressively mowing out from the center to allow wildlife to flee in all directions and not become trapped to one side.
  - Cover objects, logs, or other potential refugia should be avoided and left undisturbed while mowing.

GOAL – Water Resource Protection (WA): Manage water resources to prevent potential degradation in water quality with no net loss of acreage or functions and values.

- OBJECTIVE WA1: Conduct routine screening watershed assessments to evaluate the potential for adverse impacts on water bodies on and off the installation.
- OBJECTIVE WA2: Create and implement a program to avoid, minimize, or mitigate impacts from erosion. Installation land-disturbing activities could cause erosion and sedimentation if disturbed areas are not protected by adequate erosion and sedimentation controls.
  - Identify, inventory, and map areas at high risk for erosion in order of priority (i.e., areas adjacent to runways, road banks, and unvegetated areas).
  - Monitor re-vegetation efforts.
- OBJECTIVE WA3: Implement BMPs (such as re-vegetation and no heavy equipment on unpaved areas with saturated soils) to reduce/prevent soil erosion damage from ground disturbing activities.

GOAL – Waters of the US (WOTUS)/Wetland Management and Protection (WT): Ensure the jurisdictional determinations for onsite WOTUS and wetlands remain current.

- OBJECTIVE WT1: Develop a WOTUS, including wetlands, inventory and conduct jurisdictional determinations to include GIS mapping.
- OBJECTIVE WT2: Educate key installation and visiting personnel on the processes for conducting the mission in and adjacent to delineated and mapped WOTUS, wetlands, and floodplains.
  - Share mapping of WOTUS, wetlands, and floodplains with installation personnel, leadership and visiting personnel. Include mapping in all educational materials developed for the installation.
  - Review all construction and other projects that will result in the disturbance of the ground to determine if said projects will impact WOTUS, wetlands, and/or floodplains.

- If impacts will occur, identify the need for Section 404 and 401 permits and the steps needed to obtain those permits. Work with the NGB/A4VN NRPM to prepare and submit Section 404 permits submitted to the USACE and/or the CTDEEP and Section 401 Water Quality Certification to the state.

GOAL – Outdoor Recreation (OR): Identify possible locations for outdoor recreational opportunities for base personnel.

- OBJECTIVE OR1: Determine the feasibility of installing a multipurpose trail with interpretive signage on the installation and/or the feasibility of providing signage on existing trails.

9.0 ANNUAL WORK PLANS

The INRMP Annual Work Plans contain projects listed by fiscal year (FY). For each project, a specific timeframe for implementation is provided (as applicable), as well as the office of primary responsibility (OPR), funding source, and priority for implementation (Tables 12 through 16). Priorities are defined as follows:

- High: The INRMP signatories assert that if the project is not funded the INRMP is not being implemented and the USAF is non-compliant with the Sikes Act; or that it is specifically tied to an INRMP goal and objective and is part of a "Benefit of the Species" determination necessary for ESA Sec 4(a)(3)(B)(i) critical habitat exemption.
- Medium: Project supports a specific INRMP goal and objectives, and is deemed by INRMP signatories to be important for preventing non-compliance with a specific requirement within a natural resources law or EO 13112, *Invasive Species*. However, the INRMP signatories would not contend that the INRMP is not being implemented if not accomplished within the programmed year due to other priorities and/or funding shortfalls.
- Low: Project supports a specific INRMP goal and objectives, enhances conservation resources or the integrity of the installation mission, and/or supports long-term compliance with specific requirements within natural resources law; but is not directly tied to specific compliance within the programmed year.

Table 12. Work Plans FY 2021

Project	OPR	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.			High
Complete annual review of INRMP with installation stakeholders.		NGB	High
Complete annual review of INRMP with USFWS and CTDEEP.		NGB	High
Review natural resource studies conducted at Bradley ANGB and at Orange ANGS to identify potential project/studies to be conducted.			Medium
Work with installation planning and civil engineering offices to incorporate the INRMP into the installation's Master Plan.			Medium
Determine feasibility of implementing annual Earth Day and Arbor Day activities at Bradley ANGB and/or Orange ANGS.			Medium
Determine feasibility of working with Civil Air Patrol, Boy Scouts, Girl Scouts and other similar organizations to implement natural resource management projects.			Medium
Annually review federal and state listings for threatened, endangered and species of concern to maintain current lists of federal and state species.			High
Attend quarterly BASH meetings.			High
Develop plan of action to inventory and monitor plants and animals on Bradley ANGB and Orange ANGS.			Medium
Develop a Native Landscaping Plan to be used by design engineers to ensure use of native plant species in landscape design plans for construction and all other land disturbing activities at Bradley ANGB and Orange ANGS.			Medium
Work with grounds maintenance personnel to implement safe mowing practices to reduce mortality of herpetofauna and other wildlife that do not conflict with the BASH Plan.			Medium
Develop and implement an education outreach program to educate key installation and visiting personnel on conducting the mission in and adjacent to mapped WOTUS, wetlands, and floodplains.			Medium

Table 13. Work Plans FY 2022

Project	OPR	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.			High
Complete annual review of INRMP with internal stakeholders.		NGB	High
Complete annual review of INRMP with USFWS and CTDEEP.		NGB	High
Based on review of natural resource studies completed for Bradley ANGB and Orange ANGS, identify projects and/or additional studies that need to be implemented/conducted.		NGB	Medium
Ensure the INRMP has been incorporated into the Master Plan.		NGB	Medium
Attend quarterly BASH meetings.			High
Annually review federal and state listings for threatened, endangered and species of concern to maintain current lists of federal and state species.		NGB	High
If the feasibility study for working with Civil Air Patrol, Boy and Girl Scouts and similar organizations finds there is both interest and ability to work with these entities, develop annual work plan to successfully identify and complete natural resource projects.		NGB	Low
Implement the Native Landscaping Plan as part of landscape design plans for construction and all other land disturbing activities at Bradley ANGB and Orange ANGS.			Medium
Develop nature trail plans for Bradley ANGB Habitats 1 and 2 as part of the running trail for the north end of the base to prepare and install interpretive signage for prevalent flora and fauna.			Medium
Develop plan for perennial garden as part of cultural resources interpretive site for WWII POW guard tower foundation in cooperation with the NGB/A4VN Cultural Resources Manager.			Low
Continue to work with grounds maintenance personnel to implement safe mowing practices to reduce mortality of herpetofauna and other wildlife that do not conflict with the BASH Plan.			Medium
Continue to implement the education outreach program for key installation and visiting personnel on conducting the mission in and adjacent to mapped WOTUS, wetlands, and floodplains.			Medium
Conduct a tree inventory to identify species, size and health of trees on both Bradley ANGB and Orange ANGS.			Low
Develop a monitoring program to conduct watershed assessments to identify conditions that are benefiting onsite WOTUS, wetlands, and floodplains and conditions that are negatively affecting such systems, including but not limited to areas of erosion and sedimentation.			Medium

Table 14. Work Plans FY 2023

Project	OPR	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.			High
Complete annual review of INRMP with internal stakeholders.		NGB	High
Complete annual review of INRMP with USFWS and CTDEEP.		NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at Bradley ANGB and Orange ANGS.			Medium
Attend quarterly BASH meetings.			High
Contract for implementation of the agreed upon landscaping plan for the cultural resources interpretive site for WWII POW guard tower foundation.			Medium
Annually review federal and state listings for threatened, endangered and species of concern to maintain current lists of federal and state species.			High
Schedule natural resource projects for the coming fiscal year with the leads for the Civil Air Patrol, Boy Scouts, Girl Scouts and other similar organizations.			Medium
Monitor implementation of the Native Landscaping Plan for landscape design plans for construction and all other land disturbing activities at Bradley ANGB and Orange ANGS.			Medium

Table 15. Work Plans FY 2024

Project	OPR	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.			High
Complete annual review of INRMP with internal stakeholders.		NGB	High
Complete annual review of INRMP with USFWS and CTDEEP.		NGB	High
Continue to work with grounds maintenance personnel to implement safe mowing practices to reduce mortality of herpetofauna and other wildlife that do not conflict with the BASH Plan.			Medium
Continue to implement the education outreach program for key installation and visiting personnel on conducting the mission in and adjacent to mapped WOTUS, wetlands, and floodplains.			Medium
Based on the tree inventory, determine what actions need to be taken to ensure the continued health of trees on both Bradley ANGB and Orange ANGS.			Medium
Work with NGB/A4VN NRPM to have additional studies and/or projects developed to address the findings of the watershed assessments monitoring program.			Medium
Continue to work with grounds maintenance personnel to implement safe mowing practices to reduce mortality of herpetofauna and other wildlife that do not conflict with the BASH Plan.			Medium
Attend quarterly BASH meetings.			High
Annually review federal and state listings for threatened, endangered and species of concern to maintain current lists of federal and state species.			High

Table 16. Work Plans FY 2025

Project	OPR	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.			High
Complete annual review of INRMP with installation stakeholders.		NGB	Medium
Complete update of the INRMP with USFWS and CTDEEP.		NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at Bradley ANGB and Orange ANGS.		NGB	Medium
Attend quarterly BASH meetings.			High
Monitor the condition of the plants that were planted as part of the cultural resources interpretive site for WWII POW guard tower foundation.		NGB	Low
Annually review federal and state listings for threatened, endangered and species of concern to maintain current lists of federal and state species.			High
Schedule natural resource projects for the coming fiscal year with the leads for the Civil Air Patrol, Boy Scouts, Girl Scouts and other similar organizations.			Medium
Monitor implementation of the Native Landscaping Plan for landscape design plans for construction and all other land disturbing activities at Bradley ANGB and Orange ANGS.			Medium
Annually monitor the conditions of the nature trails and interpretative signage. Schedule maintenance work as needed.			Low
Continue to work with grounds maintenance personnel to implement safe mowing practices to reduce mortality of herpetofauna and other wildlife that do not conflict with the BASH Plan.			Medium
Continue to implement the education outreach program for key installation and visiting personnel on conducting the mission in and adjacent to mapped WOTUS, wetlands, and floodplains.			Medium
Implement actions identified in the tree inventory at both Bradley ANGB and Orange ANGS.			Medium
Continue to implement the annual monitoring of the watersheds on both Bradley ANGB and Orange ANGS. Identify projects as needed.			Medium

10.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

10.1 *INRMP Implementation*

In accordance with AFMAN 32-7003, an INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for "must fund" projects and activities as defined by Chapter 4 of AFI 32-7001, *Environmental Quality Programming and Budgeting*.
- Executes all "must fund" projects and activities in accordance with specific time frames identified in the INRMP.
- Prepares the INRMP in cooperation with appropriate stakeholders. Notifies stakeholders when a new or revised INRMP will be prepared, and solicits participation and input to the INRMP development and review process.
- Ensures that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP.
- Ensures the INRMP has been approved in writing by the appropriate representative from each cooperating agency within the past 5 years.
- Reviews the INRMP annually and coordinates annually with cooperating agencies.
- Establishes and maintains regular communications with the appropriate federal and state agencies for the region where the installation is located.
- Documents specific INRMP action accomplishments undertaken each year.
- Ensures INRMP updates and reviews are conducted in cooperation with the USFWS, CTDEEP, and National Oceanic and Atmospheric Administration (NOAA), where applicable.
- Ensures the INRMP implements ecosystem management on ANG installations by setting goals for attaining a desired land condition.

Natural resource and land use management issues are not the only factors contributing to the development and implementation of this INRMP. Facility management and other seemingly unrelated issues affect implementation. It is important to the implementation of this INRMP that personnel at Bradley ANGB take ownership of this INRMP to provide the necessary resources (e.g. personnel and equipment), and to utilize the appropriate funding allocated by the NGB/A4VN NRPM to implement the CTANG INRMP. It is extremely important that the INRMP Working Group continue to participate in the implementation of this INRMP. The INRMP Working Group is made up of the key Bradley ANGB personnel, and has an oversight role to ensure the effective implementation of this INRMP. Top and middle-level management representation, as well as representation from individuals with day-to-day on-site experience will provide the INRMP Working Group with the leadership and structure necessary for the successful implementation of this INRMP.

10.1.1 Monitoring INRMP Implementation

10.1.1.1 CTANG INRMP Implementation Analysis

The CTANG INRMP implementation will be monitored for meeting the legal requirements of the Sikes Act as well as for other mission and biological measures of effectiveness. The ultimate

successful implementation of this INRMP is realized in no net loss in the capability of the Bradley ANGB training lands to support the military mission while at the same time providing effective natural resources management.

In order to monitor and evaluate the effectiveness of the INRMP implementation the following will be reviewed, as applicable, and discussed within the context of the annual review and/or a formal review of operation and effect:

- Impacts to and from military mission
- Conservation program budget
- Staff requirements
- Program budget
- Compliance with regulatory requirements
- Program and project implementation
- Feedback from military trainers, the USFWS, CTDEEP, and others
- Trends in species and habitat diversity as evidenced by recurring biological surveys, land use changes, and opinions of natural resource experts

Some of these areas may not be reviewed every year due to lack of data or pertinent information. The effectiveness of this INRMP as a mission enabling conservation tool will be decided by mutual agreement of the USFWS, the CTDEEP, and CTANG during annual reviews and/or reviews for operation and effect.

10.1.1.2 USAF and DoD INRMP Implementation Monitoring

The USAF uses the Defense Environmental Programs Annual Report to Congress (DEPARC) to monitor Sikes Act compliance. DEPARC is the automated system used to collect installation environmental information for reporting to DoD and Congress. Established to fulfill an annual requirement to report the status of DoD's Environmental Quality program to Congress, DEPARC collects information on enforcement actions, inspections, and other performance measures for high-level reports and quarterly reviews. DEPARC also helps the USAF track fulfillment of DoD Measures of Merit requirements. The Deputy under Secretary of Defense's (DUSD) Updated Guidance for Implementation of the Sikes Act also includes an updated section, Conservation Metrics for Preparing and Implementing INRMPs. Progress toward meeting these measures of merit is reported in the annual report to Congress.

10.1.2 Priorities and Scheduling

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the Sikes Act, to be a high priority. However, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. Therefore, projects need to be funded consistent with timely execution to meet future deadlines. Projects are generally prioritized with respect to compliance. Highest priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. The prioritization of the projects is based on need, legal drivers, and ability to further implement the INRMP.

Current compliance includes projects and activities needed because an installation is currently or will be out of compliance if projects or activities are not implemented in the current program year. Examples include:

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources
- Planning documents
- Baseline inventories and surveys of natural resources (historical and archaeological sites)
- Biological assessments (BAs), surveys, or habitat protection for a specific listed species
- Mitigation to meet existing regulatory permit conditions or written agreements
- Wetland delineations in support of subsequent jurisdictional determinations
- Efforts to achieve compliance with requirements that have deadlines that have already passed

Maintenance requirements include those projects needed that are not currently out of compliance but shall be out of compliance if projects are not implemented in time to meet an established deadline beyond the current program year. Examples include:

- Compliance with future requirements that have deadlines
- Conservation and GIS mapping to be in compliance
- Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives
- Wetlands enhancement, in order to achieve the executive order for no net loss or to achieve enhancement of existing degraded wetlands
- Public education programs that explain the importance of protecting natural resources

Lower priority projects include those that enhance conservation resources of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or executive order, and are not of an immediate nature. These projects are generally funded after those of higher priority are funded. Examples include:

- Community outreach activities such as Earth Day and Historic Preservation Week activities
- Educational and public awareness projects such as interpretive displays, nature trails, wildlife checklists, and conservation teaching materials
- BAs, biological surveys, or habitat protection for a non-listed species
- Restoration or enhancement of natural resources when no specific compliance requirement dictates a course or timing of action
- Management and execution of volunteer and partnership programs

10.1.3 Funding

Implementation of this INRMP is subject to the availability of annual funding. Funding for specific projects can be grouped into three main categories by source: federal ANG or NGB funds, other

federal funds, and non-federal funds. When projects identified in the plan are not implemented due to lack of funding, or other compelling circumstances, the installation will review the goals and objectives of this INRMP to determine whether adjustments are necessary. Funding options include:

- The Legacy Resource Management Program provides financial assistance to DoD efforts to conserve natural and cultural resources on federal lands. Legacy projects could include regional ecosystem management initiatives, habitat preservation efforts, archeological investigations, invasive species control, and/or flora or fauna surveys. Project proposals are submitted to the Legacy program during their annual funding cycle (https://www.denix.osd.mil/legacy/home).
- Grant and assistance programs are administered by other federal agencies that could be accessed for natural resources management at Bradley ANGB. Examples include funds associated with the CWA and endangered species.
- Other non-federal funding sources that could be considered include The Public Lands Day Program, which coordinates volunteers to improve the public lands they use for recreation, education, and enjoyment, and the National Environmental Education and Training Foundation, which manages, coordinates, and generates financial support for the program (https://www.neefusa.org/npld).
- CTANG may also consider entering into cooperative or mutual aid agreements with states, local governments, non-governmental organizations, and other individuals.

10.1.4 Cooperative Agreements

The DoD and subcommand entities have MOU, Memorandums of Agreement (MOA), and other cooperative agreements with other federal agencies, conservation and special interest groups, and various state agencies in order to provide assistance with natural resources management at installations across the United States. Generally, these agreements allow installations and agencies, or conservation and special interest groups to obtain mutual conservation objectives. The DoD agreements applicable to Bradley ANGB include:

- MOU between DoD and USFWS/International Fund for Animal Welfare (IFAW) to promote the conservation of migratory birds (2011).
- MOU between DoD and USFWS/IFWA for a Cooperative Integrated Natural Resource Program associated with the ecosystem-based management of fish, wildlife, and plant resources on military lands (2006).
- MOU between the DoD and USEPA to form a working partnership to promote environmental stewardship by adopting IPM strategies to reduce the potential risks to human health and the environment associated with pesticides (2012).
- MOA for federal Neotropical Migratory Bird Conservation Program and addendum (Partners in Flight-Aves De Las Americas) among DoD, through each of the Military Services, and over 110 other federal and state agencies and non-governmental organizations (1991).
- MOU between the DoD and Ducks Unlimited, Inc. to provide a foundation for cooperative development of selected wetlands and associated uplands in order to maintain and increase waterfowl populations and to fulfill the objectives of the North American Waterfowl Management Plan, within the context of DoD's environmental security and military missions (2006).

- MOU between DoD and Natural Resources Conservation Service to promote cooperative conservation, where appropriate (2006).
- MOU with Watchable Wildlife Incorporated (2002).
- MOU between the DoD and Bat Conservation International to identify, document, and maintain bat populations and habitats on DoD installations (2011).
- MOA between Federal Aviation Administration, USAF, US Army, USEPA, USFWS, and USDA to address aircraft-wildlife strikes (2003).

For a further list of cooperative agreements and MOUs please visit:

https://www.denix.osd.mil/announcements/unassigned/sikes-tripartite-mou/

10.1.5 Consultation Requirements

The CTANG has multiple natural resources consultation requirements in addition to the INRMP development and review requirements as identified in the Sikes Act. Federally-listed species management requires ESA Section 7 consultation with the USFWS. State-listed species management, as well as game species management, requires consultation with CTDEEP. Actions that fall under the jurisdiction of Section 401 of the CWA necessitate permitting from CTDEEP, while Section 404 actions necessitate permitting from the USACE, USEPA, the CTDEEP, and the Town of East Granby.

The USFWS has updated the way federal agencies may consult on the effects of their actions on the northern long-eared bat. In 2016, the USFWS developed the optional streamlined Section 7 consultation framework for the northern long-eared bat. The framework was part of the USFWS' January 5, 2016 biological opinion on their issuance of a 4(d) rule for the species. Agencies can use the online determination key available through the USFWS Information Planning and Consultation website (https://ecos.fws.gov/ipac/).

10.2 Annual INRMP Review and Coordination Requirements

Per DoD policy, CTANG will review the INRMP annually in cooperation with the USFWS and CTDEEP. On an annual basis, the EM will invite the USFWS Regional Office, the USFWS local field office, the CTDEEP, and NGB/A4VN NRPM to attend a meeting or participate in a conference call to review previous year INRMP implementation and discuss implementation of upcoming programs and projects. Invitations will be either by letter or email. Attendance is at the option of those invited, but at minimum the USFWS local field office and a representative of CTDEEP are expected to attend. The meeting will be documented with an agenda, meeting minutes, and sign-in roster of attendees.

At this annual meeting the need for updates or revisions will be discussed. If updates are needed, CTANG will initiate the updates and, after agreement of all three parties, they will be incorporated in the INRMP. If it is determined that major changes are needed, all three parties will provide input and an INRMP revision will be initiated with CTANG acting as the lead coordinating agency. The annual meeting will be used to expedite the more formal review for operation and effect and, if all parties agree and document their mutual agreement, it can fulfill the requirement to review the INRMP for operation and effect.

If not already determined in previous annual meetings, by the fourth year annual review a determination will be made jointly to continue implementation of the existing INRMP with updates or to proceed with a revision. If the parties feel that the annual reviews have not been sufficient to

evaluate operation and effect and they cannot determine if the INRMP implementation should continue or be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

As part of the annual review, CTANG will specifically:

- Invite feedback from USFWS and CTDEEP on the effectiveness of the INRMP.
- Inform USFWS and CTDEEP which INRMP projects are required to meet current natural resources compliance needs.
- Document specific INRMP action accomplishments from the previous year.

10.3 INRMP Update and Revision Process

10.3.1 Review for Operation and Effect

Not less than every 5 years, the INRMP will be reviewed for operation and effect to determine if the INRMP is being implemented as required by the Sikes Act and contributing to the management of natural resources at Bradley ANGB and Orange ANGS. The review will be conducted by the three cooperating parties to include the Commander responsible for the INRMP, the Supervisor of the USFWS Northeast Region, and Commissioner of the CTDEEP. While these are the responsible parties, technical representatives generally are the personnel who actually conduct the review.

The review for operation and effect will either conclude that the INRMP is meeting the intent of the Sikes Act and only needs an update and implementation can continue; or that it is not effective in meeting the intent of the Sikes Act and it must be revised. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or in some way that reflects mutual agreement.

If only updates are needed, they will be completed in a manner agreed to by all parties. The updated INRMP will be reviewed by the local USFWS Northeast Region in Connecticut and CTDEEP. Once concurrence letters or signatures are received from the Supervisor of the USFWS Connecticut Field Office and the CTDEEP Commissioner, the update of the INRMP will be complete and implementation will continue. Generally, the environmental impact analysis will continue to be applicable to updated INRMPs, and a new analysis will not be required.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and USFWS and CTDEEP concurrence on the revised INRMP is received. The CTANG will endeavor to complete such revisions within 18 months, depending upon funding availability. Revisions to the INRMP will go through a detailed review process similar to development of the initial INRMP to ensure CTANG military mission, USFWS and CTDEEP concerns are adequately addressed, and the INRMP meets the intent of the Sikes Act.

11.0 ENVIRONMENTAL CONSEQUENCES AND CONCLUSIONS

11.1 Introduction

As discussed in Section 2.3.2, the adoption of this INRMP requires an EIAP in accordance with the NEPA, CEQ Regulations (40 CFR §1500-1508), and 32 CFR 989. The activities addressed within this document may constitute a federal action and therefore must be assessed in accordance with NEPA. To comply with NEPA, as well as other pertinent environmental requirements, the decision-

making process for the Proposed Action includes the development of this EA to address the environmental issues related to the implementation of the INRMP. The individual actions or projects described in Section 8 that have the potential to impact the environment may require additional environmental impact analysis to ensure NEPA compliance.

This INRMP is a living document that provides a framework for natural resources management into the future and is reviewed annually. Management practices included in the plan have been developed without compromising long-range goals and objectives. As the plan is implemented and updated, additional environmental analyses might be required as new management activities are developed and specific projects are implemented.

The following sections provide a description of the Proposed Action and alternatives considered, an assessment of the environmental consequences associated with each alternative, and an analysis of potential cumulative effects.

11.2 Purpose and Need

The CTANG is proposing the implementation of the INRMP, which supports the management of natural resources as prescribed by the Plan itself. The purpose of the Proposed Action is to carry out the set of recommended resource-specific management strategies developed in the INRMP, which would enable the CTANG to manage effectively the use and condition of natural resources on the installation. The INRMP is a long-term plan and is intended to be a management framework with goals, objectives, and projects that support natural resource management at the installation and that may change annually as some goals and objectives are completed or as these goals and objectives are modified to coincide with changing mission requirements or environmental conditions at the installation. Implementation of the Proposed Action would support the CTANG's need to provide realistic training for CTANG personnel in fulfillment of mission requirements while complying with environmental regulations and policies.

The need for the INRMP is to provide a means to guide CTANG in maintaining and improving the sustainability and biological diversity of the ecosystems present at the base, while supporting military readiness.

11.3 Proposed Action and Alternatives

The Proposed Action is to implement the INRMP, which supports an ecosystem approach and includes natural resources management measures to be undertaken on Bradley ANGB and Orange ANGS. The Proposed Action focuses on a 5-year planning period, which is consistent with the timeframe for the management measures described in the INRMP.

The No Action Alternative is a continuation of operations as currently conducted. Existing conditions and management practices would continue, and no new initiatives would be established. The No Action Alternative is used as a baseline against which the action alternative may be compared. Inclusion of a No Action Alternative is required and will be carried forward for further analysis.

11.4 Scope of Analysis

The potential environmental effects associated with the Proposed Action are required to be assessed in compliance with NEPA, CEQ regulations, 32 CFR Part 989, and AFI 32-7061, and AFMAN 32-7003. This EA analyzes potential environmental effects associated with implementation of the Proposed Action and the No Action Alternative in the geographical area of Bradley ANGB and Orange ANGS. The INRMP describes impacts of the military mission upon natural resources and

means to mitigate these impacts. However, this INRMP does not evaluate CTANG's military mission, nor does it replace any requirement for environmental documentation of the military mission at Bradley ANGB. This INRMP presents information on the management of natural resources on Bradley ANGB and Orange ANGS. It also describes the setting, identifies known natural resources, describes the human environment that affects natural resources, and describes how CTANG would manage resources to provide sustained military use, sustain ecological functions, protect listed and other sensitive plant and wildlife species, and support outdoor recreational uses. Major emphasis would be placed on proactive management to reduce the potential for negative environmental impacts due to the installation military mission.

The CTANG INRMP is a "living" document that focuses on a 5-year planning period based on past and present actions. Short-term management practices included in the plan have been developed without compromising long-range goals and objectives. Because the plan will be modified over time, additional environmental analyses could be required as new management measures are developed for the long-term (i.e., beyond 5 years).

11.5 Environmental Consequences

This section presents an evaluation of the environmental impacts that could potentially result from implementation of the Proposed Action and the No Action. Potential impacts are addressed in the context of the scope of the Proposed Action as described in the INRMP. The extent to which an action might affect an environmental resource depends on many factors. Environmental resources can be affected directly, indirectly, or not at all, and effects could occur in the short or long term. Environmental resources could also be affected in terms of context and intensity.

Per NEPA regulation (40 CFR 1501.7), and CEQ guidance, only those resources that have the potential to be impacted by the implementation of the Proposed Action or alternatives were carried through the EA for detailed evaluation. No impacts, positive or negative, are anticipated as a result of the Proposed Action or No Action to geology; floodplains; cultural resources; air quality; visual resources; noise; utilities and infrastructure; hazardous materials; socioeconomics, environmental justice, and protection of children; human health and safety; and airspace management. Potential environmental consequences associated with the Proposed Action and No Action Alternative for the remaining resource areas are provided below. A tabular summary of these potential environmental impacts is also presented in Table 17.

11.5.1 Soils

Proposed Action

CTANG would take a proactive approach to minimize and prevent soil erosion and compaction through implementation of revegetation plans, including interim mechanisms to stabilize the soil until vegetative cover has become established, and implementation of BMPs. The Proposed Action would minimize impacts on soils associated with erosion and sedimentation resulting in long-term beneficial impacts to the resource.

No Action

Under the No Action Alternative, minor adverse effects are expected. The revegetation plan and other actions to prevent or minimize potential soil problems related to erosion and sedimentation would not be implemented. By failing to implement the revegetation plan and other activities, impacts on soils associated with erosion and sedimentation on Bradley ANGB and Orange ANGS would be expected to continue and, perhaps, increase.

11.5.2 Water Resources- Surface Water and Waters of the US

Proposed Action

Implementation of the INRMP is expected to result in beneficial impacts to surface water and WOTUS. The INRMP describes management activities and projects to prevent potential degradation in water quality and reduce sedimentation from erosion by conducting routine screening of watersheds to evaluate the potential for adverse impacts. Monitoring high risk erosion areas, monitoring re-vegetation efforts, implementing BMPs, and planning and constructing activities in areas that are less likely to impact wetlands would also provide beneficial impacts. Brief periods of increased sedimentation are likely to occur during repair and construction activities, but these should be more than compensated for by the reduction in sedimentation. The Proposed Action offers more effective protection and mitigation for damages incurred to water resources due to the CTANG mission than does the No Action Alternative.

No Action

Under the No Action Alternative, the Bradley ANGB and Orange ANGS would not benefit from management measures associated with implementing the INRMP. The water resources are vulnerable to degradation without the implementation of a formal management plan of action that includes watershed protection measures, erosion control, and a monitoring program designed to identify water quality problems at their onset.

11.5.3 Vegetation

Proposed Action

Establishment of long-term surveying and monitoring programs under the Proposed Action would provide long-term benefits to the native vegetation on both installations. Maintaining, protecting, and enhancing habitat would benefit listed species as well as native wildlife. The INRMP uses an ecosystem management strategy to achieve biological diversity conservation, in accordance with the DoD Biodiversity Initiative. The INRMP includes specific actions to manage installation ecosystems, including wildlife habitat surveys, protection of sensitive ecological areas, and an integrated approach to pest management.

No Action

Implementation of the No Action Alternative could result in direct, long-term adverse effects to native vegetation communities as a result of habitat degradation. In the absence of an INRMP and specific management objectives and practices, the No Action Alterative would likely emphasize reaction to problems rather than a proactive approach to natural resources management.

11.5.4 Wildlife

Proposed Action

Projects listed in the INRMP and management recommendations would provide beneficial impacts to wildlife under the Proposed Action. Wildlife surveys and support of the Connecticut SWAP would provide beneficial impacts to regional biodiversity. Management actions such as migratory bird and powerline surveys and mitigation would ensure that impacts on migratory birds that may be caused by day to day operations of the installation would be minimized.

No Action

Under the No Action Alternative, management activities designated to support wildlife conservation projects in cooperation with the goals and objectives of the SWAP would not be implemented.

Consistent and long-term wildlife and ecological monitoring would not occur to track wildlife populations. Maintaining critical habitat, such as the Sand Barren Connecticut critical habitat, would be more difficult without the implementation of the INRMP. In the absence of population monitoring to identify population trends, particularly for sensitive species, and the implementation of conservation projects, long-term adverse impacts to regional biodiversity and populations may occur.

11.5.5 Special Status Species

Proposed Action

Beneficial effects on special status species at Bradley ANGB and Orange ANGS would be expected with implementation of the INRMP, as it would provide a greater degree of protection and management for species not protected under the ESA, such as state-listed species and sensitive habitats.

No Action

Listed species, except when listed under the ESA, would not be afforded protection under the No Action Alternative. The implementation of the No Action Alternative could result in long-term, adverse effects to state-listed species and biodiversity.

11.5.6 Climate Change

Proposed Action

Under the Proposed Action, CTANG would potentially develop a Greenhouse Gas Management Plan and determine the feasibility of implementing a tree conservation program. The implementation of these projects in the INRMP would potentially reduce greenhouse gas emissions and protect vegetation that is beneficial for uptake of greenhouse gases.

No Action

Under the No Action, the INRMP would not be implemented and actions to reduce greenhouse gas emissions would not be implemented. No beneficial impacts would be realized in reduction of greenhouse gases.

11.5.7 Land Use

Proposed Action

Implementation of the INRMP would have long-term beneficial effects on the natural environment within each installation and, over time, ensure the sustainability of CTANG lands to support training activities and mission requirements (i.e., no net loss in training land). Due to the integration of mission requirements in the creation of this INRMP, no negative impacts to training activities would be anticipated and the Proposed Action provides specific guidance on the conservation of ecosystem function in support of the mission.

No Action

Under the No Action Alternative, the INRMP would not be implemented and the existing level of natural resources management would continue. This could cause undeveloped training lands and existing natural resources to degrade over time. The No Action Alternative does not accommodate land use sustainability necessitated by needs of mission requirements, and therefore, could result in long-term impacts to the mission.

11.5.8 Summary of Environmental Consequences

Compared to the No Action Alternative, environmental conditions at Bradley ANGB and Orange ANGS would be conserved or improved, and the safety of the flying mission would be improved as a result of implementing the proposed INRMP. Therefore, implementing the INRMP (i.e., the Proposed Action) is the Preferred Alternative.

Table17. Summary of Potential Environmental Consequences

Resource Area	Environmental Consequence*	
	No Action Alternative	**Preferred Alternative**
Geology	No effect	No effect
Soils	Short-term adverse impact	Beneficial
Water Resources	Short-term adverse impact	Beneficial
Floodplain	No effect	No effect
Air Quality	No effect	No effect
Noise Environment	No effect	No effect
Climate	Short-term adverse impact	Beneficial
Vegetation	Long-term adverse impact	Beneficial
Fish and Wildlife	Long-term adverse impact	Beneficial
Special Status Species	Long-term adverse impact	Beneficial
Utilities and Infrastructure	No effect	No effect
Cultural Resources	No effect	No effect
Hazardous Materials	No effect	No effect
Socioeconomic Environment	No effect	No effect
Environmental Justice	No effect	No effect
Protection of Children	No effect	No effect
Human Health	No effect	No effect
Airspace Management	No effect	No effect
Cumulative Impacts	Long-term adverse impact	Beneficial

*Short- and long-term adverse impacts are expected to be less than significant

11.6 Cumulative Effects

A cumulative effect is defined, at 40 CFR §1508.7, as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place locally or regionally over a period of time.

Implementation of the INRMP would result in a comprehensive natural resources management strategy for Bradley ANGB and Orange ANGS that includes compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources, and meets legal and policy requirements consistent with national natural resources management philosophies. Implementation of the INRMP would have long-term positive effects on the natural environment. Over time, adoption of the Proposed Action would enable CTANG to achieve its goal of maintaining ecosystem viability and ensuring sustainability of desired military training conditions.

This INRMP was developed to be consistent with regional goals and objectives in the Connecticut SWAP. As development continues in areas adjacent to Bradley ANGB and Orange ANGS, protection and conservation of natural resources within the boundaries of the installation will become more important. As such, a long-term, positive cumulative effect would be expected to natural resources as a result of this INRMP and other natural resources management activities occurring within the region.

11.7 Conclusion

The Proposed Action to implement the INRMP for Bradley ANGB and Orange ANGS was analyzed by comparing potential environmental consequences against existing conditions. Findings indicate that, under the Proposed Action, potential consequences would result in either no effects or beneficial effects on each resource area. The affected environment would not be significantly or adversely impacted by proceeding with the Preferred Alternative (Proposed Action). Additionally, no significant adverse cumulative effects are expected.

Based on this EA, implementation of the Preferred Alternative (full implementation of this INRMP) would have no significant environmental or socioeconomic effects. Because no significant effects would result from implementation of the Preferred Alternative, the preparation of an EIS is not required, and the preparation of a Finding of No Significant Impact is appropriate.

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APPENDIX B. LAWS, REGULATIONS, POLICIES, AND EXECUTIVE ORDERS

Federal Laws

American Indian Religious Freedom Act of 1978 (Public Law 95-341; 42 USC §1196) – requires the United States, where appropriate, to protect and preserve religious rights of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

Animal Damage Control Act of 1931 (7 USC §426 et seq.) – provides broad authority for investigation, demonstrations, and control of mammalian predators, rodents, and birds.

Anti-Deficiency Act of 1982 (31 USC §1341 et seq.) – provides that no federal official or employee may obligate the government for the expenditure of funds before funds have been authorized and appropriated by Congress for that purpose.

American Antiquities Act of 1906 (Public Law 59-209; 16 USC §431-433) – authorizes the President to designate historic and natural resources of national significance, located on federal lands, as National Monuments for the purpose of protecting items of archeological significance.

Archeological and Historical Preservation Act of 1974 (Public Law 95-96; 16 USC §469 et seq.) – provides for the preservation of historical and archeological data, including relics and specimens, threatened by federally funded or assisted construction projects.

Archeological Resources Protection Act of 1979 (16 USC §470 et seq.) – prohibits the excavation or removal from federal or Indian lands any archeological resources without a permit.

Bald Eagle Protection Act of 1940 (Public Law 87-884; 16 USC §668a-d) – prohibits the taking or harming (i.e. harassment, sale, or transportation) of bald eagles or golden eagles, including their eggs, nests, or young, without appropriate permit.

Clean Air Act of 1970 (42 USC §7401 et seq.) – regulates air emissions from stationary, area, and mobile sources. This law authorizes the USEPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

Clean Water Act of 1972 (Public Law 92-500; 33 USC §1251 et seq.) – aims to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or water bodies under state jurisdiction. Under Section 404, a program is established to regulate the discharge of dredged or fill material into the Nation's waters, including wetlands.

Coastal Zone Management Act of 1972 (Public Law 92-583; 16 USC §1451 et seq.) – provides incentives for coastal states to develop coastal zone management programs. Federal actions that impact the coastal zone must be consistent to the maximum extent practicable with the state program.

Conservation and Rehabilitation Program on Military and Public Lands (Public Law 93-452; 16 USC §670 et seq.) – provides for fish and wildlife habitat improvements, range rehabilitation, and control of off-road vehicles on federal lands.

Conservation Programs on Military Reservations (Public Law 90-465; 16 USC §670 et seq.) – requires each military department to manage natural resources and to ensure that services are provided which are necessary for management of fish and wildlife resources on each installation; to provide their personnel with professional training in fish and wildlife management; and to give priority to contracting work with federal and state agencies that have responsibility for conservation or management of fish and wildlife. In addition it authorizes cooperative agreements (with states, local governments, non-governmental organizations, and individuals) which call for each party to provide matching funds or services to carry out natural resources projects or initiatives.

Endangered Species Act of 1973, as amended (16 USC §1531 et seq.) – provides for the identification and protection of threatened and endangered plants and animals, including their critical habitats. Requires federal agencies to conserve threatened and endangered species and cooperate with state and local authorities to resolve water resources issues in concert with the conservation of threatened and endangered species. This law establishes a consultation process involving federal agencies to facilitate avoidance of agency action that would adversely affect species or habitat. Further, it prohibits all persons subject to US jurisdiction from taking, including any harm or harassment, endangered species.

Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (Public Law 92-516; 7 USC §136 et seq.) – governs the use and application of pesticides in natural resource management programs. This law provides the principal means for preventing environmental pollution from pesticides through product registration and applicator certification.

Federal Land Policy and Management Act of 1976 (43 USC §1701) – establishes public land policy and guidelines for its administration and provides for the management, protection, development, and enhancement of the public lands.

Federal Noxious Weed Act of 1974 (Public Law 93-629; 7 USC §2801) – provides for the control and eradication of noxious weeds and their regulation in interstate and foreign commerce.

Fish and Wildlife Conservation Act of 1980 (Public Law 96-366; 16 USC §2901 et seq.) – encourages management of non-game species and provides for conservation, protection, restoration, and propagation of certain species, including migratory birds threatened with extinction.

Fish and Wildlife Coordination Act of 1934 (16 USC §661 et seq.) – provides a mechanism for wildlife conservation to receive equal consideration and coordinate with water-resource development programs.

Land and Water Conservation Act of 1965 (16 USC §4601 et seq.) – assists in preserving developing, and assuring accessibility to outdoor recreation resources.

Migratory Bird Conservation Act of 1929 (16 USC §715 et seq.) – establishes a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds.

Migratory Bird Treaty Act of 1918 (Public Law 65-186; 16 USC §703 et seq.) – provides for regulations to control taking of migratory birds, their nests, eggs, parts, or products without the appropriate permit and provides enforcement authority and penalties for violations.

National Environmental Policy Act of 1969 (Public Law 91-190; 42 USC §4321 et seq.) – mandates federal agencies to consider and document environmental impacts of proposed actions and legislation. In addition it mandates preparation of comprehensive environmental impact statements where proposed action is "major" and significantly affects the quality of the human environment.

Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601; 25 USC §§3001-3013) – addresses the recovery, treatment, and repatriation of Native American and Native Hawaiian cultural items by federal agencies and museums. It includes provisions for data gathering, reporting, consultation, and issuance of permits.

Resource Conservation and Recovery Act of 1976 (42 USC §6901 e 1860 t seq.) – establishes a comprehensive program which manages solid and hazardous waste. Subtitle C, Hazardous Waste Management, sets up a framework for managing hazardous waste from its initial generation to its final disposal. Waste pesticides and equipment/containers contaminated by pesticides are included under hazardous waste management requirements.

Sikes Act Improvement Act of 1997 (Public Law 105-85; 16 USC §670a et seq.) – amends the Sikes Act of 1960 to mandate the development of an INRMP through cooperation with the Department of the Interior (through the USFWS), DoD, and each state fish and wildlife agency for each military installation supporting natural resources.

Soil Conservation Act of 1935 (16 USC §590a et seq.) – provides for soil conservation practices on federal lands.

Federal Regulations

40 CFR 1500-1508 – CEQ Regulations on Implementing NEPA Procedures
40 CFR 6 – USEPA Regulations on Implementation of NEPA Procedures
40 CFR 162 – USEPA Regulations on Insecticide, Fungicide, and Rodenticide Use
15 CFR 930 – Federal Consistency with Approved Coastal Management Programs
50 CFR 17 – USFWS List of Endangered and Threatened Wildlife
50 CFR 10.13 – List of Migratory Birds
32 CFR 190 – Natural Resources Management Program

Federal Executive Orders (EOs)

Environmental Safeguard for Activities for Animal Damage Control on Federal Lands (EO 11870) – restricts the use of chemical toxicants for mammal and bird control.

Exotic Organisms (EO 11987) – restricts federal agencies in the use of exotic plant species in any landscape and erosion control measures.

Energy Efficiencies and Water Conservation at Federal Facilities (EO 12902) – directs federal agency use of energy and water resources towards the goals of increased conservation and efficiency.

Floodplain Management (EO 11988) – specifies that agencies shall encourage and provide appropriate guidance to applicant to evaluate the effects of their proposals in floodplains prior to submitting applications. This includes wetlands that are within the 100-year floodplain and especially discourages filling.

Off-Road Vehicles on Public Lands (EO 11989) – specifies that the respective agency shall determine if the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, and immediately close such areas or trails to the type of off-road vehicle causing such effects, until such time as it determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence.

Greening the Government through Leadership in Environmental Management (EO 13148) – requires the head of each federal agency to be responsible for ensuring that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes across all agency missions, activities, and functions.

Indian Sacred Sites (EO 13007) – provides for the protection of and access to Indian sacred sites.

Invasive Species (EO 13112) – directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Protection and Enhancement of Environmental Quality (EO 11514) – provides for environmental protection of federal lands and enforces requirements of NEPA.

Protection of Wetlands (EO 11990) – directs all federal agencies to take action to minimize the destruction loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. This applies to the acquisition, management, and disposal of federal lands and facilities; to construction or improvements undertaken, financed, or assisted by the federal government; and to the conduct of federal activities and programs which affect land use.

Responsibilities of Federal Entities to Protect Migratory Birds (EO 13186) – directs all federal agencies taking actions that have a potential to negatively affect migratory bird populations to develop and implement a MOU with the USFWS by January 2003 that shall promote the conservation of migratory bird populations.

DoDI, AFI, AFMAN, & Air Force Pamphlets (PAM)
DoDI 4715.03 – Natural Resources Conservation Program
DoDI 4165.57 – Air Installations Compatible Use Zones
DoDI 4150.07 – Pest Management Program
DoDI 6055.06 – Fire and Emergency Services Program
DoDI 4150.03 – Integrated Pest Management Program
DoDM 4715.03 – INRMP Implementation Manual
DoDM 4150.07 – DoD Pest Management Program Manual Volumes 1-3
AFMAN 32-1053 –DoD Pest Management Program
AFI 32-7062 – Air Force Comprehensive Planning
AFMAN 32-7003 – Environmental Conservation
AFPAM 91-212 – BASH Techniques

Department of Defense Memoranda
Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 20 Sept 11, Subject: *Interim Policy on Management of White Nose Syndrome in Bats.*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 3 Apr 07, Subject: *Guidance to Implement the Memorandum of Understanding to Promote the Conservation of Migratory Birds.*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 14 Aug 06, Subject: *Integrated Natural Resource Management Plan (INRMP) Template*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 17 May 05, Subject: *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands*

Memorandum, Assistant DUSD (Environment, Safety and Occupational Health), 1 Nov 04, Subject: *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning INRMP Reviews*

Memorandum, DUSD (Installations and Environment), 10 Oct 02, Subject: *Implementation of Sikes Act Improvement Act: Updated Guidance*

Memorandum, Assistant DUSD (Environment), 5 Aug 02, Subject: *Access to Outdoor Recreation Programs on Military Installations for Persons with Disabilities*.

Memorandum, Assistant Secretary of Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety and Occupational Health), 20 Sep 11, Subject: *Interim Policy on Management of White Nose Syndrome in Bats.*

State and Local Statutes
East Granby Zoning Regulations

Connecticut General Statutes- Environmental Protection
- Title 22a, Chapter 440 Sections 28-45d- Wetlands and Watercourses
- Title 22a, Chapter 446i, Sections 336-400- Water Resources and Invasive Species
- Title 22a, Chapter 446k, Sections 416-599- Water Pollution Control
- Title 26, Sections 303-316- Endangered Species