Final Integrated Natural Resources Management Plan

Battle Creek Air National Guard Base

January 2022

Air National Guard
3501 Fetchet Avenue
Joint Base Andrews, MD 20762

Michigan Air National Guard
Battle Creek Air National Guard Base
3545 Mustang Avenue
Battle Creek, MI 49037

Under Contract With:
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Contract:

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

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 [USC] § 4321 et seq.) and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP), the Michigan Air National Guard (ANG) has conducted an Environmental Assessment (EA) of the potential effects associated with implementing an Integrated Natural Resources Management Plan (INRMP) at the Battle Creek Air National Guard Base (BCANGB), Michigan. The INRMP has been prepared in accordance with the provisions of the Sikes Act as amended (16 USC § 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.* This INRMP has been prepared for the 110th Wing (110 WG) of the Michigan ANG to manage significant natural resources in support of the training mission. Significant natural resources at BCANGB include the presence of state-listed protected species, native habitat, Waters of the US (WOTUS) including wetlands, and management of the hunting program. 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 the Michigan ANG to effectively manage the use and condition of natural resources on BCANGB. The EIAP for the implementation of the 2022 INRMP does not include an analysis of effects for individual projects. Site specific NEPA analysis will be completed before the Michigan ANG implements each individual project.

Background

The 110 WG is stationed at BCANGB on the north-northwestern side of the Battle Creek Executive Airport at Kellogg Field, Calhoun County, MI. BCANGB is located on approximately 348 acres (141 hectares). The 110 WG has a dual mission: one federal and one state. The 110 WG is a preeminent multi-domain ANG Wing providing MQ-9 (an unmanned aerial vehicle [UAV] capable of remotely controlled or autonomous flight operations), cyber defense, agile combat support, command and control, and plans for combatant commanders and civil authorities. The state mission is to assist state authorities during civil and natural disaster emergencies.

Proposed Action

The Michigan ANG's Proposed Action is to implement the INRMP, which supports an ecosystem approach and includes natural resources management measures to be undertaken on BCANGB. 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 Michigan ANG's need to provide realistic training for Michigan ANG 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 on the installation are limited and they 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 effects to the resource. BCANGB 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 effects 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 effects.

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 the installation.

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

2015 Michigan Wildlife Action Plan (WAP) would provide beneficial effects to regional biodiversity. Survey efforts would inform BCANGB of species present on the installation and would allow BCANGB to manage for specific species when possible to sustain populations. Implementation of the Integrated Pest Management Plan reduces human and wildlife conflicts which could negatively impact the mission.

Special Status Species- Beneficial effects on special status species at BCANGB 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 federal Endangered Species Act (ESA), such as state-listed species, species of greatest conservation need, and sensitive habitats. No federally threatened or endangered species have been documented on BCANGB; however, a state threatened species (trumpeter swan [*Cygnus buccinators*]) and a state species of special concern (eastern box turtle [*Terrapene carolina carolina*]) have been observed and documented on the installation.

Land Use- Implementation of the INRMP would have long-term beneficial effects on the natural environment within the installation and, over time, ensure the sustainability of BCANGB 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 BCANGB INRMP was developed to be consistent with regional goals and objectives in the 2015 Michigan WAP. As development continues in areas adjacent to BCANGB, protection and conservation of natural resources within the boundaries of the installation will become more important. Measures implemented on BCANGB to prevent runoff, soil erosion, and degradation of wetlands will provide beneficial effects to the overall health of the Kalamazoo River watershed. 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.

In accordance with 40 CFR §1501.9(f)(1), the Michigan ANG, in cooperation with the National Guard Bureau Natural Resources Program Manager, determined implementation of the INRMP would have no potential impacts on geology, floodplains, air quality, climate change, noise, utilities and infrastructure, cultural resources, hazardous materials, socioeconomics, environmental justice, protection of children, human health, and airspace. Implementation of the INRMP and associated plans would assist the federal and state Environmental Managers in their efforts to successfully manage natural resources found on the installation which include state-listed species, WOTUS, including wetlands, and forested habitat.

Public Involvement

The Sikes Act requires the preparation of an INRMP in cooperation with the US Fish and Wildlife Service (USFWS) and the appropriate state fish and wildlife agency (Michigan Department of Natural Resources [MDNR]) when significant natural resources are present. In addition, the Sikes Act requires the resulting Plan to reflect the mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. The USFWS and MDNR 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. Comments from the agencies were incorporated into the INRMP.

The Sikes Act also requires public comment on the INRMP at its inception as well as during revisions when there is a mission change or changes that are expected to result in significant changes to biological resources from those identified in the existing INRMP. A Notice of Availability was placed in the *Battle Creek Enquirer* and *The Shopette* newspapers on 17 October 2021 to invite the public to comment on the Draft INRMP/EA for a period of 30 days. The documents were available at the Willard Library. No public comments were received.

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 Proposed Action to implement the INRMP would not have any significant adverse direct, indirect, or cumulative impacts on the quality of the human or natural environment. Accordingly, the requirements of NEPA, the CEQ, and 32 CFR 989 have been fulfilled and an Environmental Impact Statement is not required.

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18 Feb 2022

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

Date

SIGNATURE PAGE

This Integrated Natural Resources Management Plan (INRMP) has been prepared for the 110th Wing of the Michigan Air National Guard, located at Battle Creek Air National Guard Base (hereafter BCANGB) to manage significant natural resources in support of the training mission. Significant natural resources include the presence of state-listed protected species, native habitat, Waters of the US (WOTUS) including wetlands, and management of the hunting program. The INRMP meets the intent of the Sikes Act (16 United States Code § 670a–670l, 74 Stat. 1052).

To the extent that resources permit, the US Fish and Wildlife Service (USFWS), Michigan Department of Natural Resources (MDNR), and BCANGB, 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 BCANGB. 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:

15 APR 2022

Shawn E. Holtz, Col, MI ANG
Commander, 110th Wing
Battle Creek Air National Guard Base

Date

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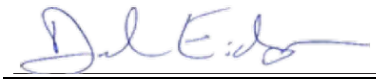
Date: 2022.02.24 12:06:26 -05'00'

Scott Hicks
US Fish and Wildlife Service

Date



3/8/2022

Daniel Eichinger
Michigan Department of Natural Resources

Date

ANNUAL REVIEW PROCEDURES

The Environmental Manager (EM) of the Battle Creek Air National Guard Base (BCANGB) will review the Integrated Natural Resources Management Plan (INRMP) annually, prior to September 30, in cooperation with the US Fish and Wildlife Service (USFWS) and the Michigan Department of Natural Resources (MDNR) to ensure the goals and objectives of the INRMP remain current. Prior to the annual meeting with the USFWS and the MDNR, the EM will schedule an internal stakeholders meeting with the Installation Pest Management Coordinator (IPMC) and tenant organizations to obtain feedback on how implementation of the INRMP affected or did not affect their programs and to obtain any comments and recommendations they may have. If BCANGB had a flying mission, the Safety Office and the US Department of Agriculture-Animal and Plant Health Inspection Service-Wildlife Services would also be invited. Following the internal stakeholders meeting, the EM will prepare a summary of the actions taken in support of the INRMP over the past year, what actions were not completed with an explanation of why they were not implemented, and the actions planned for the coming year. The EM will send out invitations with the written summary to the USFWS, MDNR, National Guard Bureau (NGB)/A4VN Natural Resources Program Manager, Safety Office, IPMC, and other entities deemed necessary to participate in an annual meeting held in-person, via a conference call, or via a Teams meeting to discuss the written summary, to address any questions regarding implementation of the INRMP over the past year, and to discuss the planned actions for the coming year. The EM will document the meeting with the invitation, an agenda, meeting minutes, and a sign-in roster of attendees. Following the meeting, the EM will submit the documentation to the USFWS and the MDNR for their review and comment and for concurrence that the documentation reflects the discussions held and the agreements made during the annual meeting. The standards used for this evaluation are set forth in DoDI 4715.03, *Natural Resources Conservation Program*, Enclosure 5. The installation's natural resources management progress will be determined based on information obtained annually that supports the focus areas in the DoDI 4715.03 through the US Air Force/NGB biannual environmental quality data calls.

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ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
110 AOG	110th Air Operations Group
110 ATKW	110th Attack Wing
110 FW	110th Fighter Wing
110 WG	110th Wing
172 FIS	172nd Fighter Interceptor Squadron
172 FS	172nd Fighter Squadron
375 FS	375th Fighter Squadron
AFI	Air Force Instruction
AFMAN	Air Force Manual
ANG	Air National Guard
ANGB	Air National Guard Base
ANGRC	ANG Readiness Center
AOC	Area of Concern
AT/FP	Antiterrorism / Force Protection
BA	Biological Assessment
BASH	Bird/Wildlife Aircraft Strike Hazard
BCANGB	Battle Creek Air National Guard Base
BCE	Civil Engineer
BMP	Best Management Practice
CATEX	Categorical Exclusion
CECOS	Civil Engineer Corps Officers School
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CWA	Clean Water Act
DEPARC	Defense Environmental Programs Annual Report to Congress
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DUSD	Deputy under Secretary of Defense
EA	Environmental Assessment
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EM	Environmental Manager
EMO	Environmental Management Office
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Map
FONSI	Finding of No Significant Impact
FW	Fish and Wildlife

FY	Fiscal Year
GIS	Geographic Information System
GM	Grounds Maintenance and Landscaping
ICRMP	Integrated Cultural Resources Management Plan
IFAW	International Fund for Animal Welfare
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IN	Invasive Species
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMC	Installation Pest Management Coordinator
IRP	Installation Restoration Program
JD	Jurisdictional Determination
JP-4	Jet Petroleum No. 4
LEDPA	Least Environmentally Damaging Practicable Alternative
MBTA	Migratory Bird Treaty Act
MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
MISP	Michigan Invasive Species Program
MNFI	Michigan Natural Features Inventory
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NGB/A4VN NRPM	NGB/A4VN Natural Resources Program Manager
NLEB	Northern Long-eared Bat
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OPR	Office of Primary Responsibility
PM	Program Management
POL	Petroleum, Oil, and Lubricant
SESC	Soil Erosion and Sediment Control
SWA	State Wildlife Area
SWPPP	Stormwater Pollution Prevention Plan
TASG	Tactical Air Support Group
TE	Threatened and Endangered
UAV	Unmanned Aerial Vehicle
US	United States
USACE	US Army Corps of Engineers
USAF	US Air Force
USC	United States Code
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
VM	Vegetative Management

WA	Water Resource Protection
WAP	Wildlife Action Plan
WNS	White-nose Syndrome
WOTUS	Waters of the US
WQC	Water Quality Certification
WT	Wetland Management and Protection
WWII	World War II

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 state and federally listed species, and sustain natural resources.

The Battle Creek Air National Guard Base (hereafter referred to as BCANGB) INRMP is intended to be in support of and consistent with the Sikes Act. This INRMP, the first for the installation, is the primary guidance document and tool for managing natural resources on BCANGB. BCANGB occupies approximately 348 acres (141 hectares) of land located on the north-northwestern side of the Battle Creek Executive Airport at Kellogg Field in Calhoun County, MI. The 110th Wing (110 WG) is located at BCANGB and has a dual mission: one federal and one state. For the federal mission, the 110 WG is a preeminent multi-domain Air National Guard (ANG) Wing providing MQ-9 (unmanned aerial vehicle [UAV] capable of remotely controlled or autonomous flight operations), cyber defense, agile combat support, command and control, and plans for combatant commanders and civil authorities. The state mission is to assist state authorities during civil and natural disaster emergencies.

Natural resource management activities on BCANGB 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, including the hunting program, and ensures that facilities remain available to support the installation's military mission into the future.

Specific actions in this INRMP are supported by its goals and objectives, the annual work plans, and the management strategies. Goals and objectives are listed in **Section 8**, and work plans are provided in **Section 9**. The 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. Implementation of the 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 BCANGB. It 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 Commander and the 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 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 the Michigan ANG. If the Michigan ANG acquires additional lands at some future time, revision of the INRMP will provide management direction for such additional lands and will identify applicable natural resources management actions to address those additional resources. The comprehensive planning process, which incorporates logistics and operations of BCANGB, should incorporate the concerns presented in this INRMP, so that 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 and the hunting program at BCANGB are managed with an ecosystem management approach as directed by Air Force Manual (AFMAN) 32-7003, *Environmental Conservation,* Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program,* and Department of Defense Manual (DoDM) 4715.03, *INRMP Implementation Manual* (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 BCANGB 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 BCANGB. 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 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 BCANGB 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. 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.

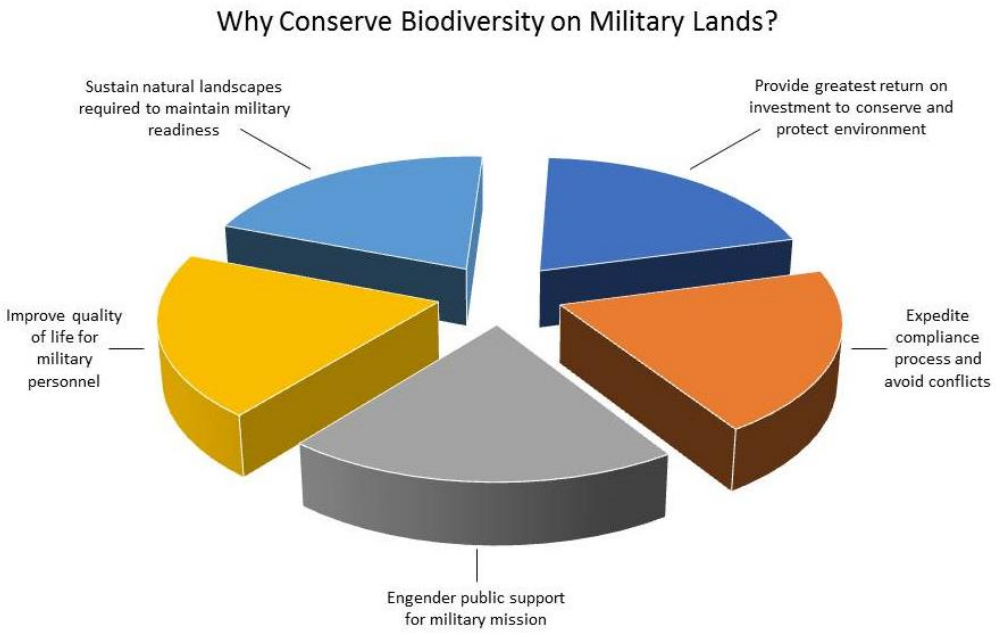


Figure 1. Why Conserve Biodiversity on Military Lands?
**Adapted from Keystone Center, 1996.*

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 BCANGB 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 Michigan ANG, US Fish and Wildlife Service (USFWS), and Michigan Department of Natural Resources (MDNR) determined an INRMP was required for BCANGB due to the presence of significant natural resources which include state-listed protected species, forested habitat, Waters of the US (WOTUS) including wetlands, and the base hunting program, 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 MDNR. The draft INRMP was provided to the USFWS and MDNR for review and comment. A Task Force meeting was held in September 2021 to discuss the draft INRMP and all interested parties, such as, the Installation Pest

Management Coordinator (IPMC), USFWS, MDNR, NGB, and the Safety Office were invited. Comments from the meeting were incorporated into the draft final INRMP which was then made available for a 30-day public review. Comments provided by the agencies included:

- Move the monarch butterfly (*Danaus plexippus*) description from the state-listed species section to the federally listed species section. The species is listed as a candidate species by the USFWS.
- Incorporate additional best management practice (BMP) recommendations for the eastern massasauga rattlesnake (*Sistrurus catenatus*).
- Consider implementation measures to increase pollinator habitat where feasible.

No public comments were received. 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, MDNR, and the ANG installation for operation and effect on a regular basis, but not less than every 5 years. Minor updates and continued implementation of an existing INRMP do not require 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 at the time of project design depending on identifiable impacts to natural resources.

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 *Code of Federal Regulations* (CFR) §1502.4 of the CEQ regulations. This requires an analysis of potential environmental impacts for the implementation of an INRMP. This document is the initial INRMP for Battle Creek and an environmental assessment (EA) was developed. Individual projects for this INRMP, however, typically undergo their own separate NEPA analysis. Required components of an EA have been incorporated into this INRMP and can be located in this document as follows:

- Purpose and Need for Action (§1501.5(c)(2) and 1502.13) – Section 11.2
- Description of Alternatives, including the Proposed Action (§1501.5(c)(2) and 1502.14) – Sections 11.3 and 11.4
- Description of Affected Environment (§1501.5(c)(1) and 1502.15) – Sections 4 and 5
- Analysis of Environmental Consequences (§1501.5(c)(2) and 1502.16) – Section 11.6
- Summary of Submitted Alternatives, Information, and Analyses (§1502.17) – Section 2.3.1
- Appendices (§1502.19)

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, Michigan ANG 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 BCANGB's 2022 INRMP was conducted in accordance with NEPA, CEQ *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 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 2022 INRMP) involved an examination of all environmental issues pertinent to the action proposed. Impact evaluations of the 2022 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 BCANGB, and other relevant local, state, and federal agencies. The EIAP for the implementation of the 2022 INRMP does not include an analysis of effects for individual projects. Individual projects that have the potential to impact the environment will be analyzed separately in accordance with the NEPA process.

If a future project has the potential to impact the environment, the initial step in compliance with NEPA is to complete USAF Form 813 "Request for Environmental Impact Analysis" (Section 989.12 of 32 CFR Part 989) through ANG Readiness Center's (ANGRC's) online NEPA Tool. The form is prepared to aid in the development of the assessment, providing information on the proposed action and its alternatives, purpose, and potential environmental effects. This allows the proponent to identify potential environmental impacts early. 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). Natural resources management actions in this INRMP at the time of implementation would be reviewed to determine if they qualify for a CATEX, EA, or would require an EIS depending on the impacts to the natural resources.

2.3.3 Responsibilities

The BCANGB 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 Commander

The Installation 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 Commander is the official signatory for the INRMP.

2.3.3.2 Base Civil Engineer

The Base Civil Engineer (BCE) 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 BCE 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 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 INRMP are reviewed by the EM and the NGB/A4VN NRPM. The EM should independently review deviations 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 (https://www.denix.osd.mil/cecos/).

2.3.3.5 Installation Pest Management Coordinator

The 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 completing monthly usage reports in the Pest Management Module in the Enterprise Environmental, Safety, and Occupational Health Management Information System when pesticides are applied. 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.

2.3.3.6 Wing Safety Office

The Wing Safety Office is responsible for development, implementation, and management of the hunting program at BCANGB with consultation and advisement from the EM. The Wing Safety Office also issues the installation hunting permits and provides the hunter safety course. The Wing Safety Office is responsible for coordinating with and providing required information to the EM on hunting activities such as harvest and number of hunters.

2.3.3.7 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.

2.3.3.8 Legal Office

The Legal Office (110th Wing Judge Advocate) is responsible for ensuring the implementation of the management objectives contained within the INRMP meets 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 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.

2.3.3.9 Public Affairs Office

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

2.3.3.10 US Fish and Wildlife Service

The USFWS is a signatory of the INRMP and provides input regarding natural resource projects and operational component plans. The USFWS reviews and comments on the operations and effect update of the INRMP every 5 years and, when feasible, attends the task force meeting. The USFWS, when feasible, attends the annual meetings to discuss the status of the projects identified in the Annual Work Plans. At both the 5-year operations and effect and the annual meetings, the USFWS advises on the status of any pending additions or deletions to the federal threatened and endangered species list that have the potential for inhabiting BCANGB. When feasible, the USFWS will support ANG wildlife and vegetation surveys conducted at BCANGB.

2.3.3.11 Michigan Department of Natural Resources

The MDNR is the state fish and wildlife agency and is a signatory of the INRMP and provides input regarding natural resource projects and operational component plans. The MDNR reviews and comments on the operations and effect update of the INRMP every 5 years and, when feasible, attends the task force meeting. The MDNR, when feasible, also attends the annual meetings to discuss the status of the projects identified in the Annual Work Plans. At both the 5-year operations and effect and the annual meetings, the MDNR advises on the status of any pending additions or deletions to the state threatened and endangered species list that have the potential for inhabiting BCANGB. When feasible, the MDNR will support ANG wildlife and vegetation surveys conducted at BCANGB.

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. BCANGB plans include the following:

- Stormwater Pollution Prevention Plan (SWPPP). Provides an overview of prevention and management of stormwater (BCANGB 2019).
- Integrated Cultural Resources Management Plan (ICRMP). Provides a plan for management of cultural resources, including legal requirements, known cultural resources, processes and responsibilities (Michigan ANG 2013).
- IPM Plan. Provides a summary of management of pest species to minimize impact to mission, natural resources, and the environment (currently under review).

In addition, this INRMP reflects the goals and objectives of the Michigan Wildlife Action Plan (WAP). The DoD and the ANG encourage integration of the WAP into the installation's natural resources management program. The Michigan WAP represents a shared vision and a strategy that has been developed by working with state, federal, and local organizations that partner with MDNR for wildlife conservation. The overall goal of Michigan's WAP is to provide a common strategic framework to coordinate conservation in Michigan for wildlife and their habitats by working together voluntarily and cooperatively toward shared goals (MDNR 2015). Several tools for conservation planning and information management to track implementation and effectiveness of the conservation actions were included in the 2015 Michigan WAP (MDNR 2015). The EM will consult with the regional MDNR office to determine areas where the installation can participate in future wildlife conservation partnerships with the MDNR in support of the WAP. In addition, the MDNR is part of the development and implementation of the INRMP.

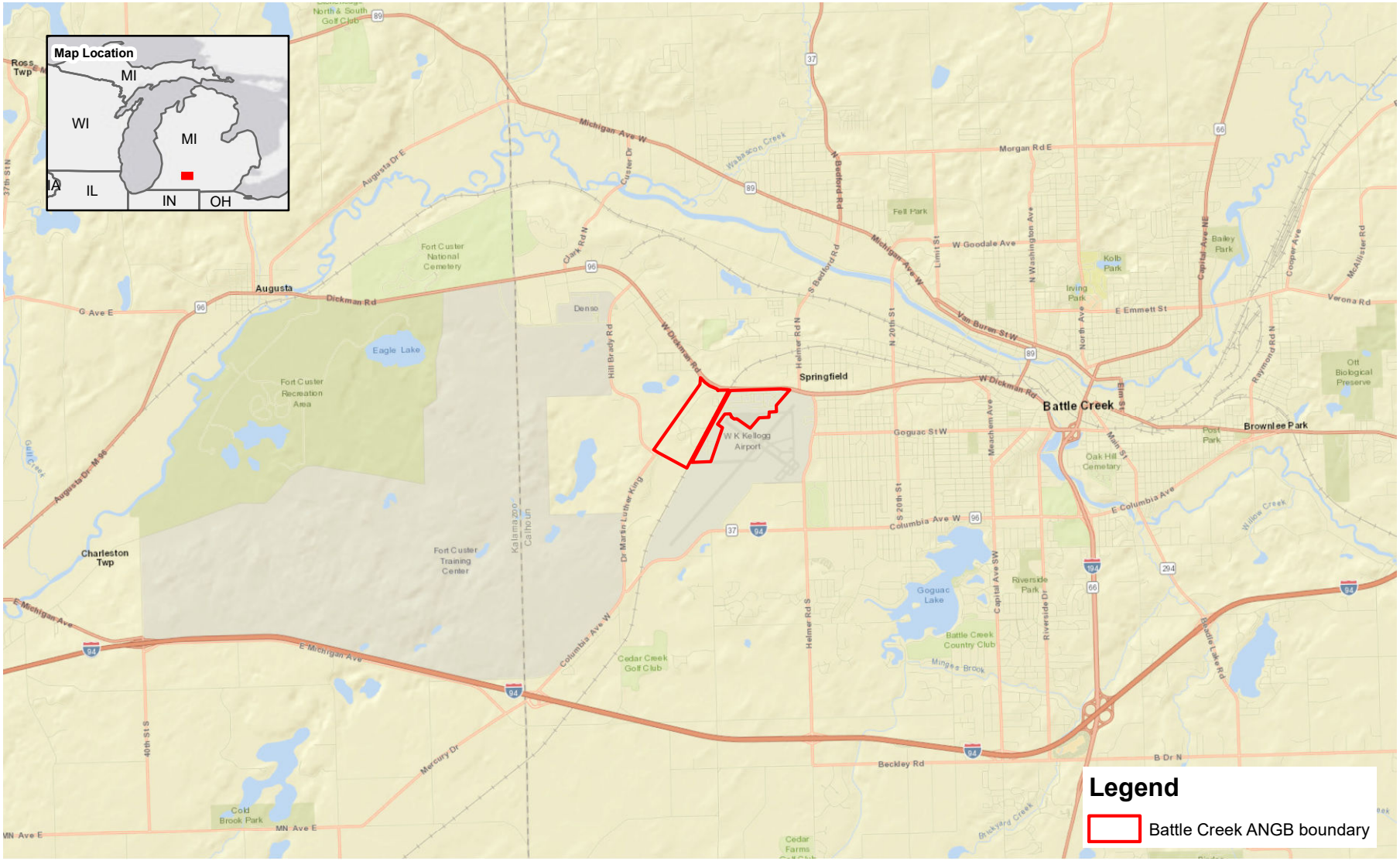
3.0 INSTALLATION OVERVIEW

3.1 Location and Area

The 110 WG is stationed at BCANGB on the north-northwestern side of the Battle Creek Executive Airport at Kellogg Field in Calhoun County, MI. The Battle Creek Executive Airport is located approximately 50 miles (80 kilometers) southwest of Lansing (Figure 2). BCANGB consists of approximately 348 acres (141 hectares). The main entrance to the property is on Dickman Road, a business loop of Interstate 94 (Figure 3).

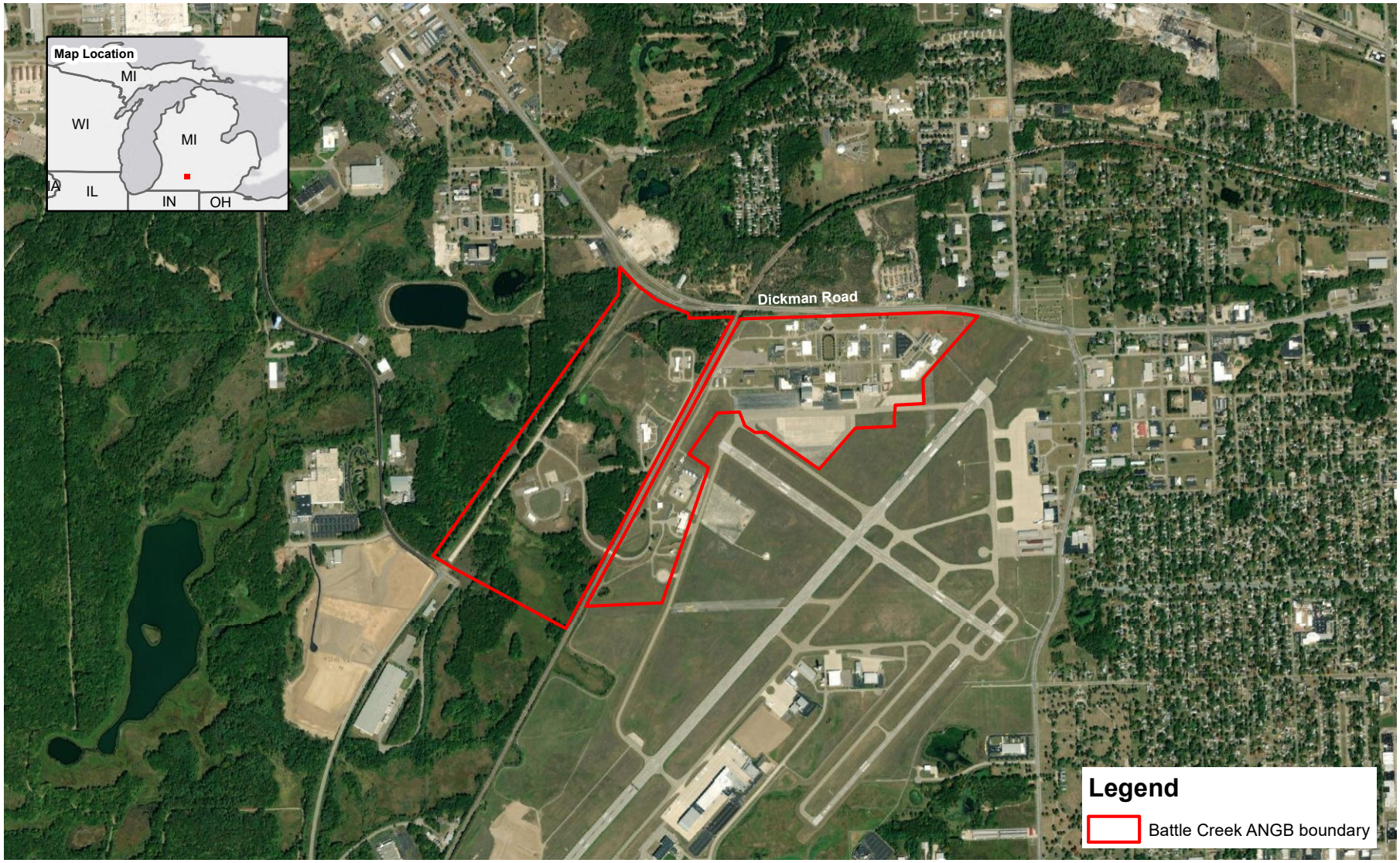
3.2 Installation History

Use of Kellogg Field in Battle Creek, MI by the US Army Air Corps dates back to 1942, when the airfield was used to support combat duty training, and stage crews for overseas deployments during World War II (WWII) until 1946. The 110 WG also dates back to WWII, having served in Europe starting in 1943 under the 361st Fighter Group, as the 375th Fighter Squadron (375 FS) flying the P-47 Thunderbolt and P-51D Mustang until deactivation in 1945. In 1946, the 375 FS was allotted to the State of Michigan as the 172nd Fighter Squadron (172 FS), and received federal recognition as an ANG squadron in 1947. In 1947, the 172 FS was assigned to Kellogg Field in Battle Creek by order of the Michigan Governor, and flew the P-51D Mustang. In 1951, the 172 FS was federally activated for the Korean War and reassigned to fly the P-51H Mustang at the Selfridge Air Force Base in Mount Clemens, MI as the 172nd Fighter Interceptor Squadron (172 FIS).



ANGB - Air National Guard Base

Figure 2. Battle Creek ANGB Regional Map



ANGB - Air National Guard Base

Figure 3. Battle Creek ANGB Installation Map

By late 1952, the 172 FIS was federally deactivated and returned to Kellogg Field under state control, and continued to fly the P-51D Mustang until 1954. Since 1954, The 110 WG has gone through numerous changes in organizational designations, missions, expansions in acreage, and aircraft. The unit mission changed to tactical reconnaissance and began flying the RB-57 Canberra aircraft until 1971. In 1962, the unit became the 110th Tactical Reconnaissance Group, and then in 1971 it became the 110th Tactical Air Support Group (TASG) (Michigan ANG 2013) and flew the propeller-drive 0-2 Skymaster. In 1980, the unit converted to jets again and was assigned the OA-37 Dragonfly. In 1986, the area the base occupied increased from approximately 90 acres to 315 acres (36 to 127 hectares) with the purchase of land to the west of the former Grand Trunk Railroad, between W.K. Kellogg Airport and Fort Custer (Michigan ANG 2013).

The unit was assigned the A-10 Thunderbolt aircraft in 1991, and was renamed the 110th Tactical Fighter Group in 1992; and in 1995, the 110th Fighter Wing (110 FW). The 110 FW took part in Operation Deny Flight joining with other A-10 Thunderbolt units from other state National Guards and active-duty USAF personnel in 1997 (Michigan ANG 2013). The 110 FW was active in both Iraq and Afghanistan, supporting Operation Iraqi Freedom and Operation Enduring Freedom. The 110 FW underwent a major transition moving from the A-10 aircraft to the Learjet C-21A aircraft in 2008. The base also witnessed the creation of a new unit, the 110th Air Operations Group (110 AOG) in April 2009. The 110 AOG is an organizational structure to support the 17th Air Force (AF AFRICA). The 110 AOG has five squadrons that include medical, communications, logistics, operations, and planning in a largely self-contained package.

In 2013, the C-21A was removed, and in 2014 the installation began remotely operating the MQ-9 Reaper as the 110th Attack Wing (110 ATKW) under the USAF's Air Combat Command and in 2017, a cyber defense squadron was created and operates on the installation as well. In order to better reflect the diversity of missions and operations supported by the installation, the 110 ATKW was designated the 110 WG in 2019.

3.3 Military Missions

The 110 WG has occupied this current location since 1947, and has gone through numerous changes in missions. Currently, the 110 WG supports a diversity of missions and tenants including the 172nd Attack Squadron, 217th Air Operations Group, 272nd Cyber Operations Squadron, 110th Mission Support Group, 110th Medical Group, the Defense Logistics Agency, the Army and Air Force Exchange Service, Michigan State Police Cyber Operations, and the STARBASE youth education program. The 110 WG is a preeminent multi-domain ANG Wing providing MQ-9, cyber defense, agile combat support, command and control, and plans for combatant commanders and civil authorities. Currently the installation is not authorized for aircraft, but in previous years missions included aircraft, thus the infrastructure to support such a mission still exists on the installation.

During peacetime, the 110 WG comes under the jurisdiction of the Michigan Governor through the Adjutant General of the Department of Military and Veterans Affairs, Michigan National Guard. When directed by the state, the 110 WG aids in natural disasters, assists in controlling civil disorders, and provides humanitarian relief activities.

3.4 Surrounding Communities

BCANGB occupies the western and northwestern regions of Kellogg Field across the airfield from the Battle Creek Executive Airport, and encompasses approximately 348 acres (141 hectares) along State Highway M-96 (Dickman Road) and Skyline Drive (closed) in Battle Creek, MI. BCANGB is surrounded by a mix of industrial and commercial businesses in the City of Springfield to the north,

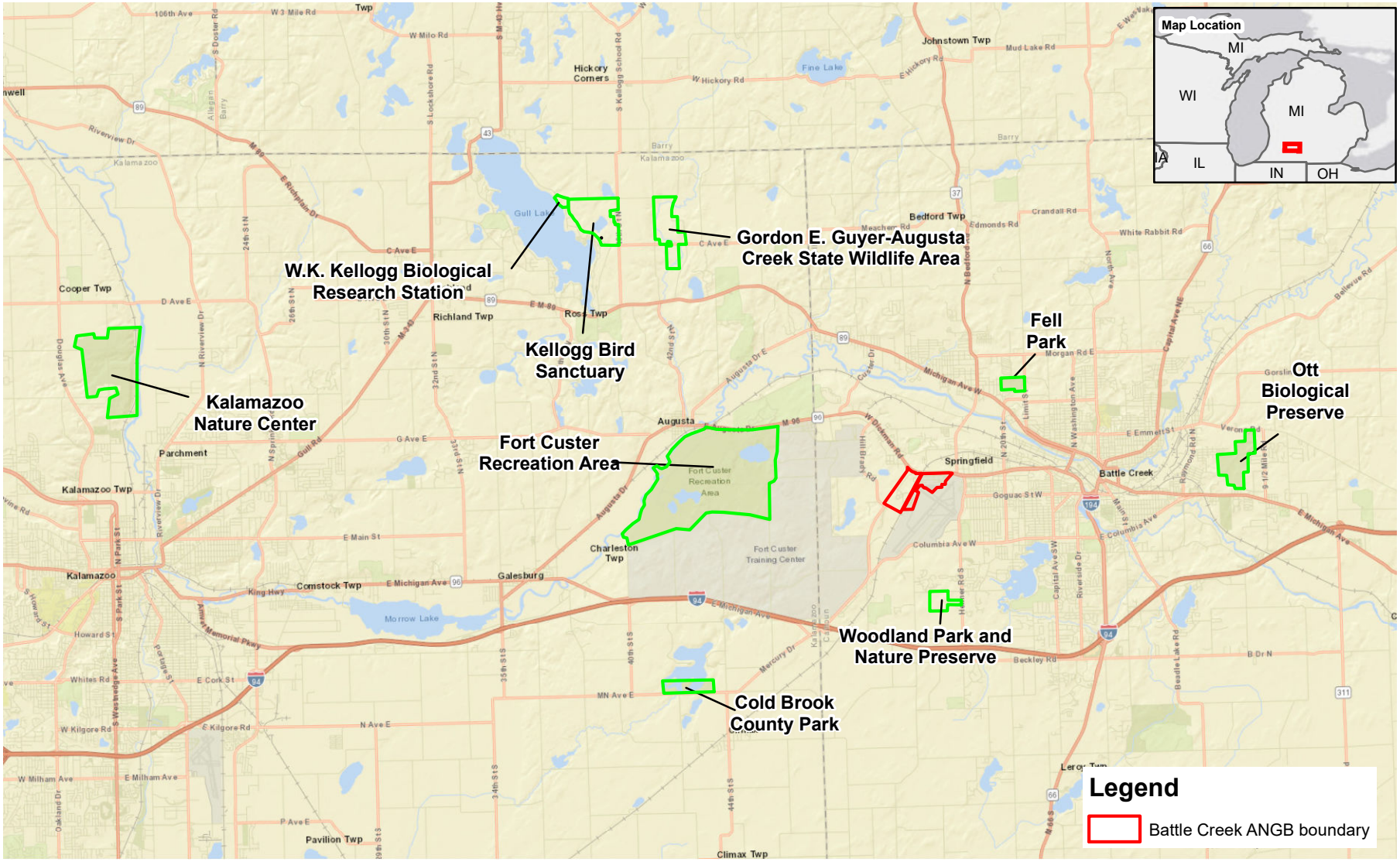
industrial businesses in the City of Battle Creek to the west and south, and airport property to the east (BCANGB 2018). Across from the base in the City of Springfield, there are industrial sites, such as Airway Auto Parts & Recycling and Consumers Concrete Corporation. Manufacturing companies, such as Franklin Plastics, Marley Precision, Inc., and Janesville Acoustics, have facilities surrounding the base and airport in the City of Battle Creek (BCANGB 2018).

The communities surrounding the installation and the airport include Battle Creek, Springfield, and Brownlee Park. The estimated population in Battle Creek in 2019 was 51,316 (US Census Bureau 2021). Surrounding communities in Calhoun County with populations estimated in 2019 include: Springfield (population of 5,193) and Brownlee Park (population of 1,686) (US Census Bureau 2021).

3.5 Local and Regional Natural Areas

Significant natural areas in the vicinity of BCANGB retain examples of the region's native landscape. BCANGB is located near the confluence of Helmer Creek which partially begins on BCANGB property and the Kalamazoo River. Regional natural areas near BCANGB include parks, trails, and nature and biological reserves (Figure 4):

- Fort Custer Recreation Area is a 3,033-acre (1,227-hectare) park located due west of the installation and is maintained by the MDNR. The park features three lakes, the Kalamazoo River, campgrounds, equestrian trails, a swimming beach, boat rentals, and more than 40 miles (64 kilometers) of trails. The area was originally the location of Camp Custer, a military training center, until it was deeded to the state in 1971 (MDNR 2021a).
- Woodland Park and Nature Preserve is a 145-acre (58.7-hectare) preserve managed by the City of Battle Creek located south of the installation. The preserve offers miles of trails through various habitats including wetlands and wooded areas. The park and preserve also provide green space for several conservation groups (BCRD 2021a).
- Cold Brook Country Park is a 276-acre (112-hectare) park located southwest of the installation and maintained by Kalamazoo County. The area is a popular campground and offers recreational opportunities such as boating and a beach (Kalamazoo County 2021).
- Fell Park is an approximate 86-acre (35-hectare) recreational park managed by the City of Battle Creek located northeast of the installation. The park includes a baseball field, trails, a playground, and a picnic shelter (BCRD 2021b).
- The Ott Biological Preserve is a 298-acre (103-hectare) preserve located to the east of the installation and is managed by Calhoun County. The preserve contains natural habitat suitable for hiking and wildlife observation (Calhoun County 2020).
- The W.K. Kellogg Biological Station is a field education/experimental research complex administered through Michigan State University. The 3,873-acre (1,566-hectare) station includes the W.K. Kellogg Bird Sanctuary, W.K. Kellogg Farm, Kellogg Biological Station Academic and Research Facilities, W.K. Kellogg Conference Center and Manor House, and Lux Arbor Reserve. The station is located northwest of BCANGB along Gulf Lake and is a premier site for field experimental research in aquatic and terrestrial ecology that takes advantage of the diverse managed and unmanaged ecosystems (MSU 2021a).



ANGB - Air National Guard Base

Figure 4. Local and Regional Natural Areas near Battle Creek ANGB

- The Gordon E. Guyer – Augusta Creek State Wildlife Area (SWA) is approximately 386 acres (156 hectares) in northeast Kalamazoo County along Augusta Creek, and located approximately 8.7 miles (14 kilometers) northeast of BCANGB. The Augusta Creek SWA provides access for trout fishermen to Augusta Creek, access for game bird and deer hunting, and is managed to maintain the natural ecological integrity of the area (MDNR 2021b).
- The Kalamazoo Nature Center contains 1,100 acres (445 hectares) of wooded, rolling countryside located 5 miles (8 kilometers) north of Kalamazoo, and to the west of BCANGB. The Kalamazoo Nature Center operates a visitor's center with gardens, trails, and the Delano Farm (Kalamazoo Nature Center 2021).

4.0 PHYSICAL ENVIRONMENT

4.1 Climate

The climate in Battle Creek, MI, is moderately warm during the summer and cold during the winter months; high temperatures tend to be in the mid-70s to low 80s and low temperatures in the 30s, respectively. The nearest National Weather Service weather station measuring both temperature and precipitation is located at the Battle Creek Executive Airport. The average annual rainfall is 37.4 inches (95 centimeters). The least amount of rainfall occurs in February at approximately 1.9 inches (4.8 centimeters); most precipitation falls in summer and early fall. The temperatures are highest on average in July, at around 82.6 degrees Fahrenheit (°F) [28.1 degrees Celsius (°C)]. In January, the average high temperature is 31.6 °F (- 0.2°C) which is the lowest average temperature of the whole year. The variation in the precipitation between the driest and wettest months is 2.43 inches (6.17 centimeters). Average monthly temperature and precipitation data are provided in Table 2.

Table 2. Average Monthly Temperatures and Precipitation in the Region

Month	Average Low Temperature (°F)	Average High Temperature (°F)	Average Precipitation (inches)
January	15.6	31.6	1.66
February	17.3	35.4	1.34
March	24.9	46.4	1.91
April	36.1	60.1	2.8
May	45.7	70.5	3.77
June	55.2	79.4	3.23
July	59.2	82.6	3.36
August	57.8	80.7	3.47
September	49.9	73.4	3.65
October	39.3	61.0	3.14
November	30.4	47.9	2.83
December	19.8	35.2	1.99

Source: NOAA 2021

°F degrees Fahrenheit

Climate Change

DoDI 4715.03, *Natural Resources Conservation Program,* requires the INRMP to include an assessment of the potential impacts of climate change on natural resources on the installation and to adaptively manage such resources to minimize adverse mission impacts. Climate change could have serious impacts on the state's diverse ecosystems and native species, and may encourage the spread

of non-native species. Climate change would also likely alter the natural range of many different plants and animals.

In 2019, the Governor signed Executive Directive 2019-12 that commits Michigan to implement policies to achieve 26-28 percent cuts in emissions by 2025. In 2020, the Governor signed Executive Directive 2020-10 that commits Michigan to be carbon neutral in all sectors - electricity, transportation, and buildings - by 2050 (Michigan 2021). The Council on Climate Solutions was created to formulate and oversee the implementation of the Michigan Healthy Climate Plan, which will serve as the action plan for the state to reduce greenhouse gas emissions and transition toward economy-wide carbon neutrality (EGLE 2021a).

In the last century, most of Michigan has seen a warming by 2 to 3 °F (1.1 to 1.6 °C) and the state in the next decades will have more extremely hot days (EPA 2016). Ice covering the Great Lakes is forming later and melting sooner. Heavy rainstorms are becoming more frequent which increases the amount of pollutants that run off from land to water, so the risk of algal blooms will be greater if storms become more severe (EPA 2016). Climate change is lowering water tables in the Great Lakes Basin and decreasing total wetland area in Michigan (MCAN 2021). BCANGB has several large wetland features that could potentially be impacted by lowering water tables. Species such as quaking aspen (*Populus tremuloides)* noted on the installation may decline as warmer weather prevails and changes the composition of the forest habitat in favor of more mesic species.

4.2 Landforms and Geology

BCANGB is located in the Hilly Moraines physiographic region of Michigan's Lower Peninsula. The region is made up of a series of moraines, and as a whole, is characterized as gently rolling to hilly with a considerable amount of relatively level topography and many lakes and poorly drained land (MSU 2021b). Today, Calhoun County is characterized by four basic physiographic surface features: moraines, till plains, outwash plains, and lacustrine plains. In the vicinity of BCANGB, the prominent landforms are outwash plains and moraines. Outwash plains, commonly found at lower elevations, are characterized by nearly level to sloping topography. Moraines, typically situated at higher elevations, are characterized by nearly level to hilly relief and "pothole depressions" (Michigan ANG 2013).

Figure 5. Battle Creek ANGB Landscape

A geologist would describe the Michigan geological basin as the bowl-shaped remains of an ancient tropical sea (CMU 2021). The Battle Creek Outwash Plain is a broad, flat plain that served as a major drainage way for the Laurentide Ice Sheet of the Wisconsin Glaciation which covered all of Michigan and the Great Lakes area until it retreated from Michigan around 12,000 to 10,000 years ago (Michigan ANG 2013). As the glaciers retreated, melting runoff water formed unconsolidated tills, gravels, sands, silts, and clays that effectively mask much of the bedrock geology, particularly in the Southern Peninsula (MDEQ 2003).

4.3 Soils

Associated soils on both outwash plains and low moraines are predominantly well-drained sandy loams that can be droughty or subject to wind erosion. Within the vicinity of BCANGB, the most ubiquitous soil types are udipsamments and udorthents (sandy or gravelly fill materials, respectively) introduced during construction of the Battle Creek Executive Airport (Figure 6). Other soil types include Alganesee fine sand and undrained Houghton muck (in the southwestern portion of the installation) and a number of well drained sandy loam soils, including Spinks and Oshtemo. Within BCANGB, these soil types are associated with slopes of up to 40 percent (USDA NRCS 2021).

4.4 Hydrology

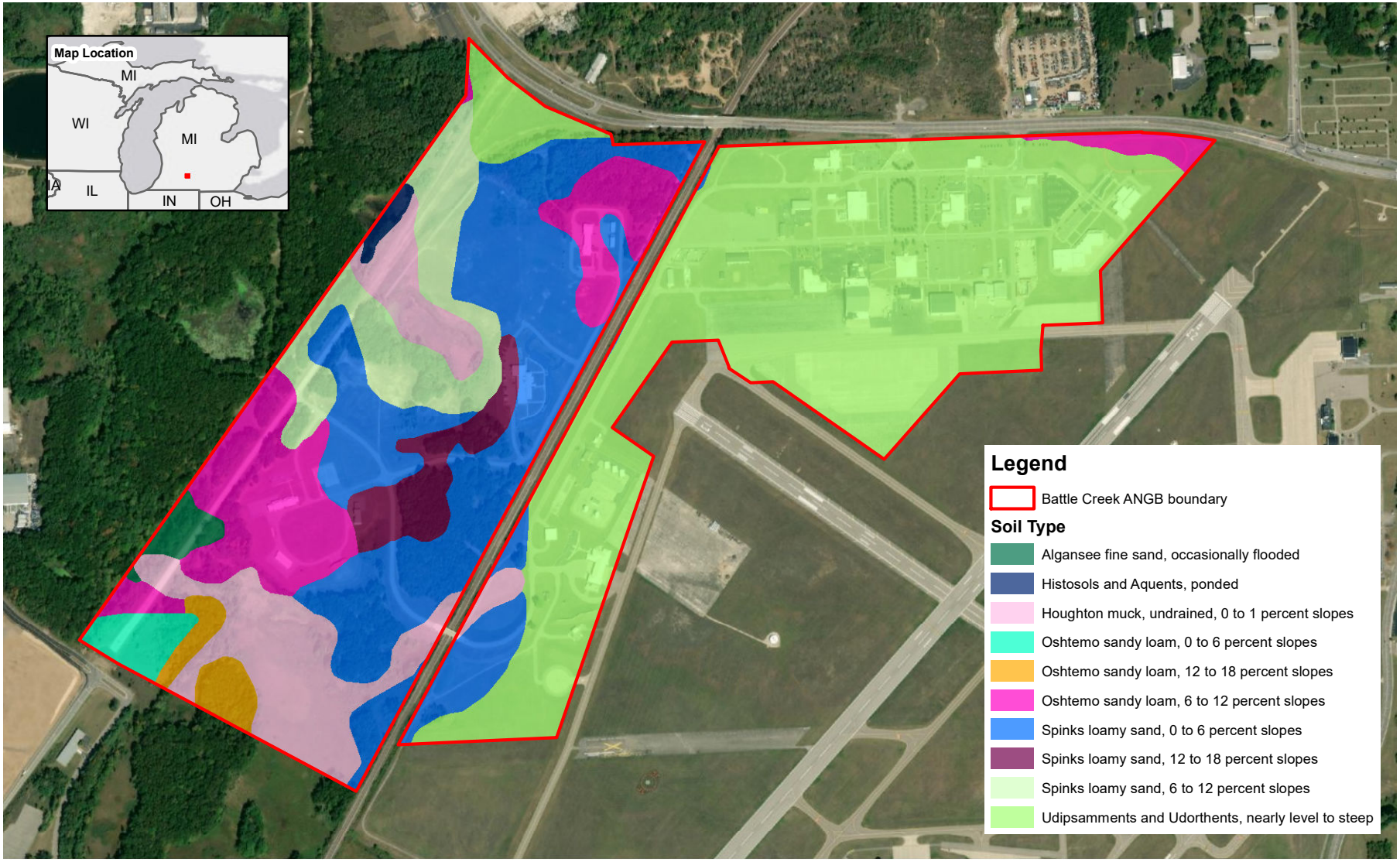
4.4.1 Groundwater

Michigan is fortunate in that it generally has abundant underground water resources (Sommers 1984). The two principal sources of groundwater found in the area of BCANGB include the Marshall Formation aquifer underlying all but the southwest portion of the installation, and glacial "drift" deposits (glacial drift aquifer) of sand and gravel mantling the bedrock (Vanlier 1966). The Marshall Formation, composed of medium to fine-grained sandstone, is one of the principal aquifers in the Southern Peninsula of Michigan, as well as the source of most of the groundwater produced in the area. The City of Battle Creek obtains all its drinking water from the Marshall Formation (City of Battle Creek 2019). The soils of the Battle Creek area and the installation are moderately to highly permeable, and in much of the area rain and snow infiltrate readily into the ground. Thus, there is little surface runoff, and a larger proportion of the precipitation infiltrates to the groundwater reservoirs. Nearly all the water recharged into the Marshall Formation moves to it through the overlying glacial-drift aquifer (Vanlier 1966).

4.4.2 Surface Water

BCANGB is situated in the Kalamazoo River watershed which discharges to Lake Michigan near Saugatuck in Allegan County (MDEQ 2008). The 2,030-square-mile (5,258-square-kilometer) Kalamazoo River watershed includes portions of 10 Michigan counties. The Kalamazoo River lies 1.4 miles (2.3 kilometers) north of BCANGB. Several water features, including Harts Lake to the west, surround the installation. One of the unnamed streams that forms Helmer Creek just to the west of the installation is derived from the wetland complex in the southwest property of BCANGB. Helmer Creek generally flows east to northeast, passes under highway M-96 (Dickman Road) west of the installation, enters the Beaver Dam Pond in Springfield and then flows into the Kalamazoo River after passing under River Road West to the north of the installation.

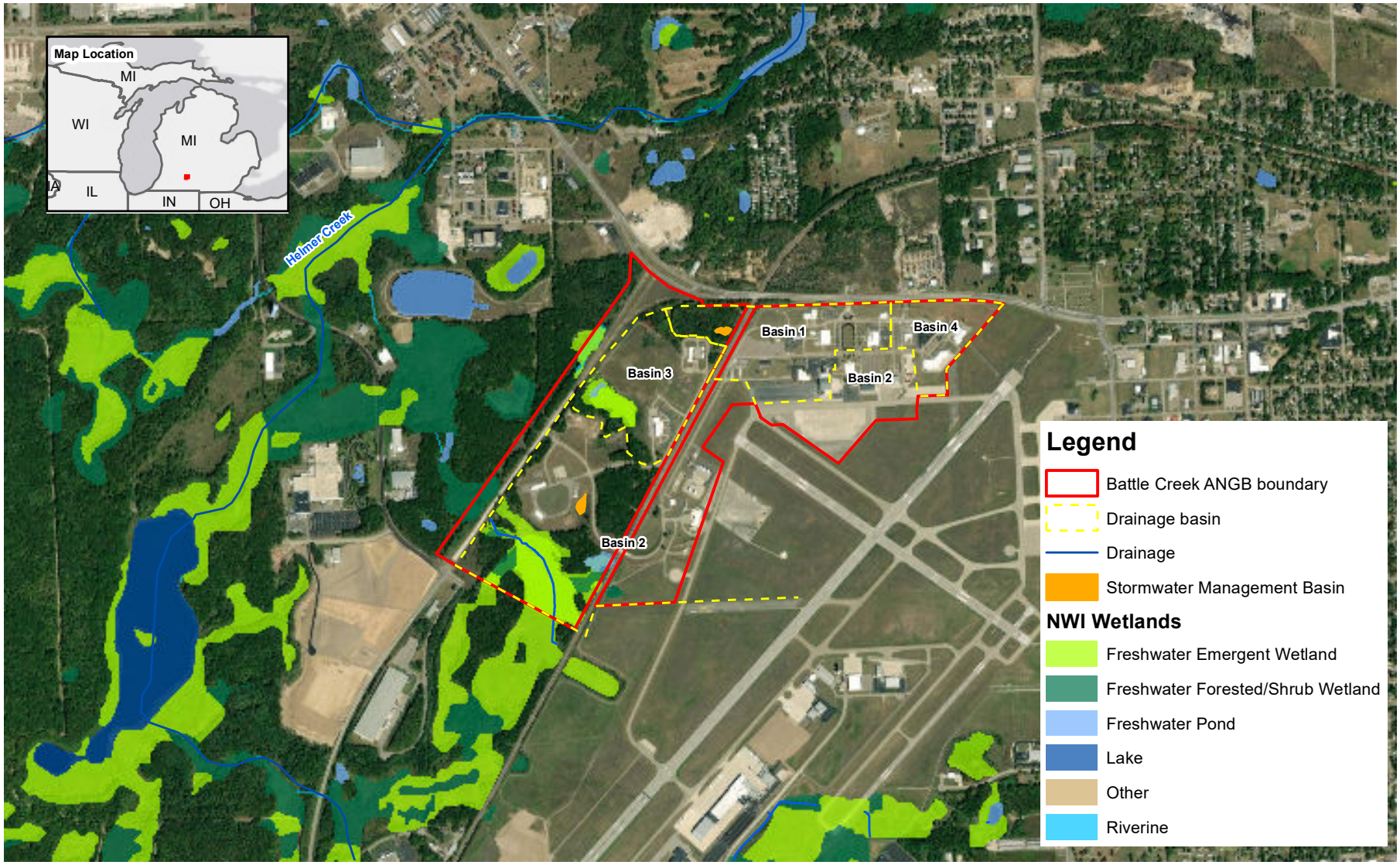
Surface waters on the installation are comprised of five wetlands, an unnamed stream, and stormwater management basins (further discussed in Section 5.5). The installation is currently organized into four primary drainage basins, but this is subject to change (Figure 7). Drainage Basin 1 includes most of the buildings on the base and the area north of the aircraft apron and taxiways. This area drains through storm sewers to the west and beneath the railroad tracks until it discharges into the wetland at Outfall #1. Drainage Basin 1 also has many stormwater inlets/outlets that are standalone and discharge into swales. Drainage Basin 2 includes several buildings in the northcentral area of the base, the northern central region of the airfield owned and operated by the Battle Creek Executive Airport, and a large portion of the undeveloped land and the wetland complex in the southwest region of the installation. This area drains to the southwest corner of the base at Outfall #2.



ANGB - Air National Guard Base

0 1,000 2,000 Feet

Figure 6. Soil Map for Battle Creek ANGB



ANGB - Air National Guard Base

0 1,000 2,000 3,000 Feet

Figure 7. Hydrology Map for Battle Creek ANGB

Drainage Basin 3 drains the western-central portion of the base, and discharges into the wetland adjacent to Outfall #3. This outfall receives stormwater runoff from the impervious parking lot areas around Building 7020, and flows through an engineered rocky/grassy swale, which discharges westward downslope into the moderate size wetland on the western-central edge of the base. Outfall #3 discharges from an uphill point adjacent to the wetland west of Building 7020. Discharges that enter the wetland occur as overland flow from the swales constructed around the parking lot of Building 7020. Typically, there is no discharge from this outfall except during significantly heavy rain events. Drainage Basin 4 collects stormwater from the northeastern area of the installation, and discharges it to three points. Two of the points discharge into a constructed swale north of Building 6925 on the north side of Thunderbolt Avenue, and the third discharges into a swale in the very northeastern corner of the installation, that is connected to a stormwater conveyance pipe going under highway M-96 (Dickman Road) that discharges into a constructed stormwater catchment basin owned by the City of Battle Creek.

5.0 ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

5.1 Ecosystem Classification

BCANGB is located within the Battle Creek Outwash Plain of the Southern Michigan/Northern Indiana Drift Plains ecoregion (EPA 2007). The ecoregion contains a diverse assortment of landforms as well as many lakes and marshes and is characterized by oak-hickory forests, northern swamp forests, and beech forests (EPA 2007).

5.2 Vegetation

5.2.1 Historic Vegetative Cover

Historically the ecoregion's pre-settlement vegetation was diverse. The soils of the outwash plain supported Michigan's largest concentration of dry tallgrass prairies that were maintained by frequent fires. Wet prairies and savanna habitats were also common. Oak savanna grew on gently sloping terrain where fires were more frequent which then gave rise to the steeper terrain and the oak-hickory forest grew in steeper terrain with moist conditions (EPA 2007).

5.2.2 Current Vegetative Cover

BCANGB consists of developed lands and maintained landscape in the cantonment area and three other habitat types: disturbed, woodland/hardwood, and emergent wetlands (Figure 8) outside of the cantonment area. These four unique habitats were delineated during the flora fauna surveys conducted in June 2019. Within these habitats a total of 84 unique vegetative species were documented. Sixty of the species are considered native and the remainders are introduced species (Table 3). Four of the 60 native species can also be considered introduced. A description of each habitat type identified on BCANGB is detailed below.

Table 3. Plant Species Observed at BCANGB

Scientific Name	Common Name	Cover Type(s) Observed	Origin[1]
Acer rubrum	Red maple	Woodland	Native
Achillea millefolium	Common yarrow	Disturbed/ Maintained	Either
Ailanthus altissima	Tree-of-heaven	Woodland	Introduced
Alliaria petiolata	Garlic mustard	Emergent Wetland/Woodland	Introduced
Andropogon gerardii	Big bluestem	Maintained	Native
Anthriscus sylvestris	Wild chervil	Woodland	Introduced
Argemone albiflora	White prickly poppy	Disturbed	Native
Asclepias syriaca	Common milkweed	Maintained	Native
Asplenium platyneuron	Ebony spleenwort	Emergent Wetland	Native
Brassica rapa	Field mustard	Maintained	Introduced
Berberis thunbergii (japonica)	Japanese barberry	Woodland	Introduced
Bromus inermis	Smooth brome	Disturbed	Introduced
Caltha palustris	Yellow marsh marigold	Emergent Wetland	Native
Carex alopecoidea	Foxtail sedge	Emergent Wetland	Native
Carex comosa	Longhair sedge	Woodland (Forested Wetland)	Native
Carex hirtifolia	Pubescent sedge	Emergent Wetland	Native
Carex hystericina	Shallow sedge	Emergent Wetland	Native
Carex lacustris	Hairy sedge	Emergent Wetland	Native
Carex stricta	Upright sedge	Emergent Wetland	Native
Carex vulpinoidea	Fox sedge	Emergent Wetland	Native
Carya ovata	Shagbark hickory	Woodland	Native
Celastrus orbiculata	Oriental bittersweet	Emergent Wetland/ Woodland	Introduced
Celastrus scandens	American bittersweet	Woodland	Native
Celtis occidentalis	Common hackberry	Woodland	Native
Cirsium arvense	Canada thistle	Disturbed	Introduced
Cornus florida	Flowering dogwood	Woodland	Native
Dactylis glomerata	Orchardgrass	Disturbed/ Maintained	Introduced
Diervilla lonicera	Northern bush honeysuckle	Disturbed	Native
Digitaria sanguinalis	Hairy crabgrass	Maintained	Introduced
Elaeagnus umbellata	Autumn olive	Emergent Wetland/Disturbed	Introduced
Equisetum arvense	Field horsetail	Emergent Wetland	Native
Erigeron sp.	Fleabane	Maintained	Native
Euonymus alatus	Winged burning bush	Woodland	Introduced
Fragaria virginiana	Wild strawberry	Woodland	Native
Frangula alnus (i.e. Rhamnus frangula)	Glossy buckthorn	Emergent Wetland/ Woodland	Introduced
Fraxinus pennsylvanica	Green ash	Woodland	Native

Scientific Name	Common Name	Cover Type(s) Observed	Origin[1]
Galium boreale	Northern bedstraw	Emergent Wetland/ Woodland	Native
Hesperis matronalis	Dames rocket	Emergent Wetland/ Woodland	Introduced
Heuchera americana	American alumroot	Woodland	Native
Impatiens capensis	Jewelweed	Emergent Wetland	Native
Iris versicolor	Harlequin blueflag	Emergent Wetland	Native
Leucanthemum vulgare	Oxeye daisy	Maintained	Introduced
Lysimachia thyrsiflora	Tufted loosestrife	Emergent Wetland	Native
Onoclea sensibilis	Sensitive fern	Emergent Wetland	Native
Phalaris arundinacea	Reed canarygrass	Emergent Wetland	Native
Picea pungens	Blue spruce	Maintained	Introduced
Plantago lanceolata	Narrowleaf plantain	Maintained	Introduced
Poa pratensis	Kentucky bluegrass	Disturbed/Emergent Wetland/ Maintained	Introduced
Polygonum aviculare	Knotweed	Emergent Wetland	Native
Populus deltoides	Eastern cottonwood	Emergent Wetland	Native
Populus grandidentata	Bigtooth aspen	Emergent Wetland	Native
Populus tremuloides	Quaking aspen	Emergent Wetland	Native
Potentilla recta	Sulphur cinquefoil	Woodland	Introduced
Prunus serotina	Black cherry	Woodland	Native
Prunus virginiana	Chokecherry	Woodland	Native
Quercus alba	White oak	Woodland	Native
Quercus macrocarpa	Bur oak	Woodland	Native
Quercus palustris	Pin oak	Emergent Wetland/ Woodland	Native
Quercus rubra	Northern red oak	Woodland	Native
Ranunculus acris	Tall buttercup	Maintained/Woodland	Either
Rhus aromatica	Fragrant sumac	Woodland (Forested Wetland)	Native
Ribes cynosbati	Eastern prickly gooseberry	Woodland	Native
Rosa multiflora	Multiflora rose	Emergent Wetland	Introduced
Rubus sp.	Blackberry	Emergent Wetland	Either
Rumex acetosella	Common sheep sorrel	Disturbed/ Maintained	Introduced
Sagittaria latifolia	Broadleaf arrowhead	Emergent Wetland	Native
Salix interior	Sandbar willow	Emergent Wetland	Native
Salix nigra	Black willow	Woodland (Forested Wetland)	Native
Sassafras albidum	Sassafras	Woodland	Native
Schoenoplectus tabernaemontani	Softstem bulrush	Emergent Wetland	Native
Sisyrinchium albidum	Common blue-eyed grass	Maintained	Native
Solidago canadensis	Canada goldenrod	Emergent Wetland	Native
Sparganium sp.	Bur reed	Emergent Wetland	Native

Scientific Name	Common Name	Cover Type(s) Observed	Origin[1]
Symplocarpus foetidus	Skunk cabbage	Emergent Wetland	Native
Taraxacum officinale	Dandelion	Maintained	Either
Tilia americana	American basswood	Woodland	Native
Toxicodendron radicans	Eastern poison ivy	Emergent Wetland/Woodland	Native
Tradescantia ohiensis	Common spiderwort	Emergent Wetland	Native
Tragopogon dubius	Yellow salsify	Maintained	Introduced
Trifolium repens	White clover	Maintained	Introduced
Typha x. glauca	Hybrid cattail	Emergent Wetland	Native
Urtica dioica	Stinging nettle	Emergent Wetland	Native
Viola cucullata	Marsh violet	Emergent Wetland	Native
Verbascum thapsus	Common mullein	Maintained	Introduced

Source: BCANGB 2021a

1 Native species are defined by the US Department of Agriculture (USDA) as species that are naturally occurring at the time of European colonization. An introduced species is a species that arrived later from some other part of the world. Species classified as "either" are native species that can be classified in either category because the species has infraspecific taxa that either are native or introduced.

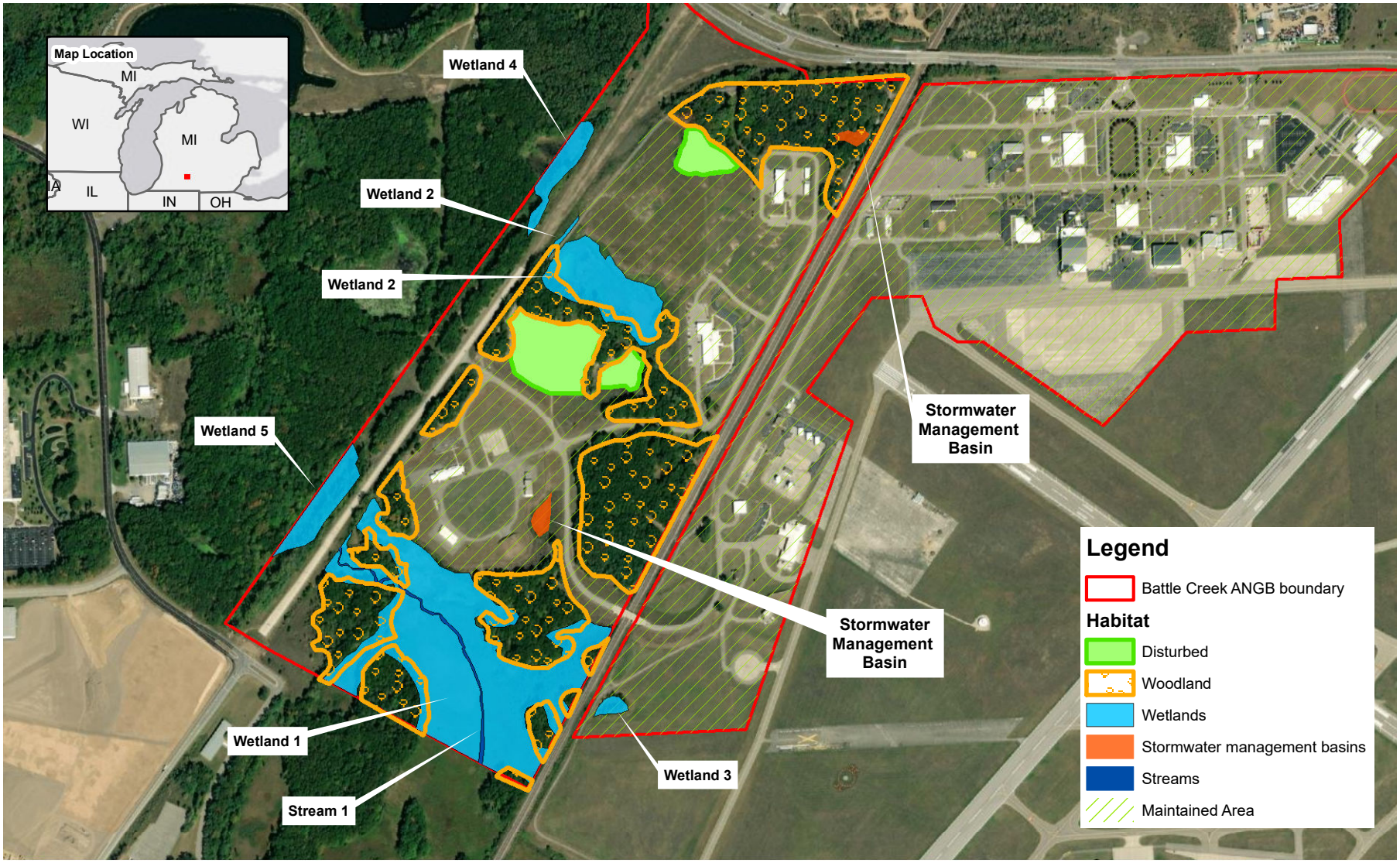


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Figure 8. Habitat Distribution at Battle Creek ANGB

5.2.3 Maintained/Landscaped

The maintained/landscaped habitat is interspersed throughout the 348 acres (141 hectares) and comprises the largest habitat type found on the installation. The dominant canopy cover is comprised of landscaped blue spruce (*Picea pungens*) with the herbaceous cover dominated by Kentucky bluegrass (*Poa pratensis*), dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), crabgrass (*Digitaria sanguinalis*), and narrowleaf plantain (*Plantago lanceolate*). The regularly mowed and maintained grassland areas are dominated by Kentucky bluegrass and common sheep sorrel (*Rumex acetosella*).

5.2.4 Disturbed

Two types of disturbed habitat (7.25 acres [2.9 hectares]) occur on BCANGB. The first type is a disturbed grassland consisting of Kentucky bluegrass, common sheep sorrel, and smooth brome (*Bromus inermis*), with a few midstory trees of autumn olive (*Elaeagnus umbellate*). The second type is a disturbed shrubland habitat dominated by glossy buckthorn (*Frangula alnus*) with smooth brome and Kentucky bluegrass in the herbaceous layer.

5.2.5 Woodland

Two distinct types of hardwood forest (woodland) habitats occur in patches on the western side of the installation (55.2 acres [22.3 hectares]). The first type of woodland is dominated by red maple (*Acer rubrum*), northern red oak (*Quercus rubra*), and black cherry (*Prunus serotine*), with tree-of-heaven (*Ailanthus altissima*) occurring in the subcanopy. The herbaceous layer found in this habitat included poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), dames rocket (*Hesperis montralis*), northern bedstraw (*Galium boreale*), and American alumroot (*Hueuchera americana*). Poison ivy and tree-of-heaven are highly invasive species.

A dry/mesic hardwood forest is located on the southwestern portion of the property. Like the other woodland habitat, the canopy is dominated by red maple and northern red oak; pin oak (*Quercus palustris*) and shagbark hickory (*Carya ovata*) are also prominent. The subcanopy is dominated by shagbark hickory with the shrub layer dominated by eastern prickly gooseberry (*Ribes cynosbati*), black cherry, and glossy buckthorn. Virginia creeper, garlic mustard (*Alliaria petiolate*), bedstraw, and poison ivy comprise the herbaceous layer.

5.2.6 Wetlands

A total of five potentially jurisdictional wetlands (35.8 acres [14.5 hectares]) and one stream channel identified as WOTUS were identified on the installation and are further discussed in Section 5.5.

5.3 Fish and Wildlife

A total of 54 birds, 14 mammals (including four bat species documented during the bat surveys), five reptiles, five amphibians, and two insect species were observed on BCANGB during a 2019 survey (Tables 4 through 7). Mist net and acoustic bat surveys were conducted on June 3-4 and on July 29-30, 2019. The surveys identified four species of bats (Table 5). None of the bats captured during the mist net surveys showed evidence of white-nose syndrome (WNS). No aquatic species surveys have been conducted on the base.

Table 4. Bird Species Observed at BCANGB

Scientific Name	Common Name	Scientific Name	Common Name
Agelaius phoeniceus	Red-winged blackbird	*Icterus spurius*	Orchard oriole
Aix sponsa	Wood duck	*Melanerpes carolinus*	Red-bellied woodpecker
Anas platyrhynchos	Mallard	*Meleagris gallopavo*	Wild turkey
Archilochus colubris	Ruby-throated hummingbird	*Melospiza melodia*	Song sparrow
Ardea herodias	Great blue heron	*Myiarchus crinitus*	Great crested flycatcher
Baeolophus bicolor	Tufted titmouse	*Passerina cyanea*	Indigo bunting
Bombycilla cedrorum	Cedar waxwing	*Pheucticus ludovicianus*	Rose-breasted grosbeak
Branta canadensis	Canada goose	*Picoides pubescens*	Downy woodpecker
Buteo jamaicensis	Red-tailed hawk	*Pipilo erythrophthalmus*	Eastern towhee
Butorides virescens	Green heron	*Poecile atricapillus*	Black-capped chickadee
Cardinalis cardinalis	Northern cardinal	*Quiscalus quiscula*	Common grackle
Cathartes aura	Turkey vulture	*Riparia riparia*	Bank swallow
Charadrius vociferus	Killdeer	*Sayornis phoebe*	Eastern phoebe
Colaptes auratus	Northern flicker	*Scolopax minor*	American woodcock
Columba livia	Rock pigeon	*Setophaga petechia*	Yellow warbler
Contopus virens	Eastern wood peewee	*Sialia sialis*	Eastern bluebird
Corvus brachyrhynchos	American crow	*Spinus tristis*	American goldfinch
Cyanocitta cristata	Blue jay	*Spizella passerina*	Chipping sparrow
Cygnus buccinator	Trumpeter swan	*Spizella pusilla*	Field sparrow
Dumetella carolinensis	Gray catbird	*Sturnus vulgaris*	European starling
Empidonax traillii	Willow flycatcher	*Thryothorus ludovicianus*	Carolina wren
Eremophila alpestris	Horned lark	*Toxostoma rufum*	Brown thrasher
Euphagus cyanocephalus	Brewer's blackbird	*Turdus migratorius*	American robin
Geothlypis trichas	Common yellowthroat	*Tyrannus tyrannus*	Eastern kingbird
Haemorhous mexicanus	House finch	*Vireo flavifrons*	Yellow-throated vireo
Hirundo rustica	Barn swallow	*Vireo olivaceus*	Red-eyed vireo
Icterus galbula	Baltimore oriole	*Zenaida macroura*	Mourning dove

Source: BCANGB 2021a

Table 5. Mammal Species Observed at BCANGB

Scientific Name	Common Name	Scientific Name	Common Name
Castor canadensis	American beaver	*Marmota monax*	Groundhog
Eptesicus fuscus	Big brown bat	*Odocoileus virginianus*	White-tailed deer
Glaucomys volans	Southern flying squirrel	*Sciurus niger*	Fox squirrel
Ictidomys tridecemlineatus	Thirteen-lined ground squirrel	*Sylvilagus floridanus*	Eastern cottontail
Lasionycteris noctivagans	Silver-haired bat	*Tamias striatus*	Eastern chipmunk
Lasiurus borealis	Eastern red bat	*Taxidea taxus*	American badger
Lasiurus cinereus	Hoary bat	*Vulpes vulpes*	Red fox

Source: BCANGB 2020 and 2021a

Table 6. Herpetofauna Species Observed at BCANGB

Scientific Name	Common Name
Reptiles	
Chelydra serpentina	Common snapping turtle
Chrysemys picta	Painted turtle
Rachemys scripta elegans	Red-eared slider
Terrapene carolina carolina	Eastern box turtle
Thamnophis sirtalis sirtalis	Eastern garter snake
Amphibians	
Ambystoma laterale	Blue-spotted salamander
Hyla cinerea	American green tree frog
Lithobates catesbeianus	Bullfrog
Lithobates pipiens	Northern leopard frog
Rana clamitans	Green frog

Source: BCANGB 2021a

Table 7. Insect Species Observed at BCANGB

Scientific Name	Common Name
Danaus plexippus	Monarch butterfly
Papilio glaucus	Eastern tiger swallowtail

Source: BCANGB 2021a

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 and/or the National Marine Fisheries Service. According to the USFWS, three federally listed species are known to occur in Calhoun County, MI and could potentially occur on the installation (Table 8; USFWS 2020 and 2021a). The monarch butterfly was recently listed as a candidate species by the USFWS. In addition, Michigan enacted the Endangered Species Act of the State of Michigan in 1994, which designated the MDNR as responsible for listing species and what conservation strategies to use for each species. A total of 330 species are described as threatened or endangered in Michigan by the Michigan Natural Features Inventory (MNFI; MNFI 2019a). According to MNFI's county report of threatened and endangered species, there are 39 state or federally listed species in Calhoun County, as well as 41 species of special concern and five species that were once present, but are now assumed extirpated from Michigan (MNFI 2019b).

Table 8. State and Federally Listed Species in Calhoun County, Michigan

Scientific Name	Common Name	Listing
Invertebrates		
Acella haldemani	Spindle lymnaea	SC
Alasmidonta marginata	Elktoe	SC
Alasmidonta viridis	Slippershell	T
Bombus pensylvanicus	American bumble bee	SC
Catinella protracta	Land snail	E
Danaus plexippus	Monarch butterfly	C
Fontigens nickliniana	Watercress snail	SC

Scientific Name	Common Name	Listing
Lasmigona compressa	Creek heelsplitter	SC
Lasmigona costata	Flutedshell	SC
Lepyronia angulifera	Angular spittlebug	SC
Ligumia recta	Black sandshell	E
Mesomphix cupreus	Copper button	SC
Oecanthus laricis	Tamarack tree cricket	SC
Orconectes immunis	Calico crayfish	SC
Pleurobema sintoxia	Round pigtoe	SC
Speyeria idalia	Regal fritillary	E
Stenelmis douglasensis	Douglas stenelmis riffle beetle	SC
Utterbackia imbecillis	Paper pondshell	SC
Venustaconcha ellipsiformis	Ellipse	SC
Villosa iris	Rainbow	SC
Fish		
Erimyzon claviformis	Creek chubsucker	E
Moxostoma carinatum	River redhorse	T
Notropis anogenus	Pugnose shiner	E
Notropis chalybaeus	Ironcolor shiner	X
Notropis texanus	Weed shiner	X
Amphibians		
Acris blanchardi	Blanchard's cricket frog	T
Lithobates palustris	Pickerel frog	SC
Reptiles		
Clemmys guttata	Spotted turtle	T
Emydoidea blandingii	Blanding's turtle	SC
Nerodia erythrogaster neglecta	Copperbelly water snake	E
Sistrurus catenatus	Eastern massasauga	FT, SC
Terrapene carolina carolina	Eastern box turtle	SC
Birds		
Ammodramus henslowii	Henslow's sparrow	E
Ammodramus savannarum	Grasshopper sparrow	SC
Chondestes grammacus	Lark sparrow	X
Cygnus buccinator	Trumpeter swan	T
Falco peregrinus	Peregrine falcon	E
Haliaeetus leucocephalus	Bald eagle	SC
Pandion haliaetus	Osprey	SC
Parkesia motacilla	Louisiana waterthrush	T
Protonotaria citrea	Prothonotary warbler	SC
Rallus elegans	King rail	E
Setophaga cerulea	Cerulean warbler	T
Setophaga citrina	Hooded warbler	SC
Spiza americana	Dickcissel	SC

Scientific Name	Common Name	Listing
Mammals		
Glaucomys sabrinus	Northern flying squirrel	SC
Myotis septentrionalis	Northern long-eared bat	FT, SC
Myotis sodalis	Indiana bat	FE, E
Perimyotis subflavus	Tri-colored bat	SC
Plants		
Agrimonia rostellata	Beaked agrimony	T
Amorpha canescens	Leadplant	SC
Angelica venenosa	Hairy angelica	SC
Arnoglossum plantagineum	Prairie Indian-plantain	SC
Baptisia lactea	White or prairie false indigo	SC
Brickellia eupatorioides	False boneset	SC
Carex amphibola	Creek sedge	SC
Conioselinum chinense	Hemlock-parsley	SC
Corydalis flavula	Yellow fumewort	T
Cypripedium candidum	White lady slipper	T
Dichanthelium leibergii	Leiberg's panic grass	T
Dichanthelium microcarpon	Small-fruited panic-grass	SC
Eleocharis compressa	Flattened spike rush	T
Eleocharis engelmannii	Engelmann's spike rush	SC
Eleocharis radicans	Spike rush	X
Eryngium yuccifolium	Rattlesnake-master	T
Eupatorium sessilifolium	Upland boneset	T
Filipendula rubra	Queen-of-the-prairie	T
Fraxinus profunda	Pumpkin ash	T
Galearis spectabilis	Showy orchid	T
Geum virginianum	Pale avens	SC
Helianthus hirsutus	Whiskered sunflower	SC
Helianthus mollis	Downy sunflower	T
Hydrastis canadensis	Goldenseal	T
Isotria verticillata	Whorled pogonia	T
Lechea minor	Least pinweed	X
Mertensia virginica	Virginia bluebells	E
Panax quinquefolius	Ginseng	T
Papaipema beeriana	Blazing star borer	SC
Papaipema cerina	Golden borer	SC
Platanthera ciliaris	Orange- or yellow-fringed orchid	E
Platanthera leucophaea	Prairie white-fringed orchid	E
Silene stellata	Starry campion	T
Viola pedatifida	Prairie birdfoot violet	T
Zizania aquatica	Wild rice	T

Source: USFWS 2013, 2020, and 2021a; MNFI 2019b
FE = Federally endangered FT = Federally threatened C = Candidate E = Endangered (state) T = Threatened (state)
SC = Species of Special Concern (state) X = believed extirpated in the state

5.5 Waters of the US, Wetlands, and Floodplains

5.5.1 Waters of the US

A WOTUS survey was conducted for BCANGB in 2019 and 2020. A total of 35.8 acres (14.5 hectares) of wetlands and 1,887 linear feet (575.2 linear meters) of stream were delineated within the installation (Figure 9). A full description of these five wetlands and one watercourse can be found in the WOTUS report (BCANGB 2021b). A brief description of the wetland habitat is summarized below by the wetland type.

Wetland 1, the largest wetland on the installation (25.69 acres [10.39 hectares]), is a palustrine emergent wetland occurring at the southwest corner of the installation. The vegetation of Wetland 1 is dominated by hybrid cattail (*Typha x. glauca*) and lake sedge (*Carex lacustris*).

Wetland 2 is a 5.74-acre (2.32-hectare) emergent wetland also dominated by hybrid cattail and reed canary grass (*Phalaris arundinacea*). Sandbar willow (*Salix interior*) and glossy buckthorn dominate the subcanopy layer in these wetlands. Woody shrubs and vines noted in the wetlands include poison ivy, blackberry (*Rubus argutus*), and Virginia creeper. Pubescent sedge (*Carex hirrifolia*), jewelweed (*Impatiens capensis*), and stinging nettle (*Urtica dioica*) often dominated the herbaceous layer. Autumn olive, Oriental bittersweet, glossy buckthorn, and multiflora rose (*Rosa multiflora*) are invasive species noted in the wetlands. The adjacent upland vegetation along the south boundary of Wetland 2 consisted of upland hardwood forest dominated by white oak (*Quercus alba*) with recently cleared areas to the north and east boundary consisting of smooth brome and Canada goldenrod (*Solidago canadensis*).

Wetlands 3 and 5 comprise approximately 2.7 acres (1.1 hectares) of palustrine forested wetlands. The vegetation in these wetlands is dominated by black willow (*Salix nigra*) and reed canary grass.

Wetland 4 is a 1.67-acre (0.68-hectare) unconsolidated bottom wetland located along the western boundary of the installation. The vegetation of Wetland 4 is dominated by lake sedge and broadleaf arrowhead (*Sagittaria latifolia*).

Stream 1 is a 1,887-linear-foot (575.2-linear-meter) perennial stream located in the southwestern portion of the installation. Stream 1 flows from south to west and is located entirely within the boundary of Wetland 1. Stream 1 enters the installation along the southern boundary and flows through Wetland 1 in a northwesterly direction until entering a large corrugated metal pipe culvert where it then flows into Wetland 5.

5.5.2 Floodplains

Floodplains are lowlands and relatively flat areas adjoining waters that are subject to flooding. The 100-year floodplain is designated based on different factors on the Federal Insurance Rate Maps (FIRMs) along with other flooding and storm surge information. With respect to occurrence a 100-year flood has a one percent chance of occurring in any given year and the 500-year flood has a 0.2 percent chance in any given year. The limits to which that flood reaches define the floodplains. Floodplains are regulated by the Federal Emergency Management Agency (FEMA) with standards outlined in 44 CFR Part 60.3. EO 11988, *Floodplain Management*, requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains. No floodplains (FIRM #26025C0159C, #26025C178C, and #26077C0250D, effective April 4, 2011) occur on BCANGB (Figure 10; FEMA 2011).

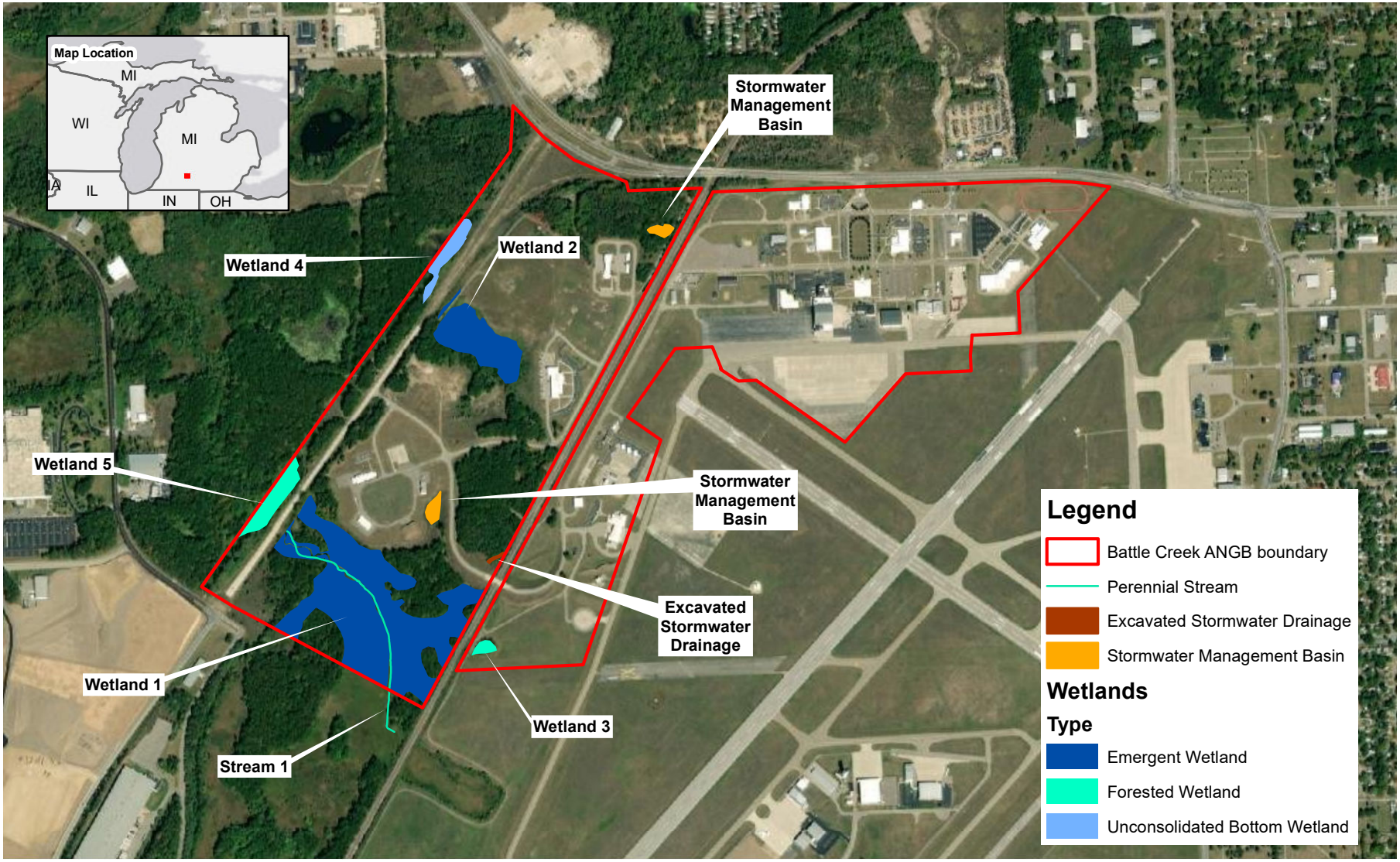

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Figure 9. Waters of the US and Wetlands on Battle Creek ANGB

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Figure 10. Flood Hazard Zones at Battle Creek ANGB

6.0 MISSION IMPACTS ON NATURAL RESOURCES

6.1 Natural Resources Needed to Support the Military Mission

Missionscape refers to the condition of the landscape best suited to support the various missions and varies depending upon the type of training. The 110 WG mission provides MQ-9, cyber defense, agile combat support, command and control, and plans for combatant commanders and civil authorities. The ideal Missionscape for the Wing is to transition BCANGB lands into a campus-like environment that allows for consolidated facilities in a smaller footprint with some open space. Thus, natural resources needed to support the 110 WG mission include vegetated buffers for water quality preservation and some open space for security and safety clear zones associated with antiterrorism / force protection (AT/FP) and training exercises. 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. BCANGB 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 Installation Planning

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

- BCANGB must manage state and federally listed species without impacting the mission. Any new activities or infrastructure could be limited in areas where state or federally listed species are known to occur or where there is state priority habitat.
- Any project that is anticipated to significantly impact floodplains must undergo the NEPA process per 32 CFR Part 989 and be approved by the 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.
- Any project which is anticipated to impact WOTUS including wetlands must obtain a Section 404 Permit from the US Army Corps of Engineers (USACE) and a Section 401 Water Quality Certification (WQC) from the Michigan Department of Environment, Great Lakes, and Energy (EGLE). 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 Part 328; the 1987 USACE Wetlands Delineation Manual, Technical Report Y-87-1, and 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.

6.2.1 Land Use

BCANGB is located on approximately 348 acres (141 hectares) of land. The installation is located on the north-northwestern side of the Battle Creek Executive Airport which is generally bounded on the north and east by Interstate 94, on the north by Michigan Highway M-96, and on the west by an unnamed stream and woodlots west of Skyline Drive. Land use is divided into the following categories on the installation (BCANGB 2011):

- Safety Zones and Airfield Clearance Areas – includes building height restrictions, building setbacks, and other safety criteria/restrictions (e.g., quantity-distance safety area).
- Airfield Pavement – includes all paved areas outside the flight line including taxiways, runways, overruns, shoulders, apron, power check pad, aircraft parking areas, and arm/disarm pads.
- Industrial – includes warehouses, maintenance and utilities functions; industrial services such as those belonging to transportation, supply, and BCE; and petroleum, oil, and lubricant (POL) operations (e.g., jet fuel storage).
- Command and Support – includes operational training, security, entry gates/visitor management, dining hall, fitness center, medical training and administrative facility, and communications.
- Special Categories – includes activities such as small arms firing ranges, munitions maintenance and training, munitions storage, hazardous materials/waste storage, and fire training facilities.
- Open Space – includes permanent open space for landscaping, building setbacks, recreation, and water areas, and temporary open space reserved for future development.

6.2.2 Current Major Impacts

Mission activities at BCANGB include maintaining a level of operational readiness that provides trained and equipped combat-ready tactical units ready for immediate integration into the active USAF. Impacts to natural resources are more likely to result from mission support activities, including facility and utility construction activities. In addition, support and non-mission related activities, such as management and disposal of hazardous substances, industrial operations, and landscape maintenance activities can potentially affect natural resources. The current major impacts to natural resources from the BCANGB military mission include:

- Impacts to the environment from the potential misuse of hazardous materials and pesticides.
- Impacts from installation restoration sites.
- Impacts from unmanaged stormwater discharge.

6.2.2.1 Installation Restoration Sites

The Defense Environmental Restoration Program (DERP) was developed by the DoD to investigate and clean up hazardous substances, pollutants, and contaminants that pose environmental health and safety risks at active military installations and formerly used defense sites. Future development of sites identified through the DERP might be constrained depending on the severity of the contamination or the extent of the remedial action required. The overall objective of the DERP is to identify potential environmental problems and provide timely remedies to protect public health and the environment. The Installation Restoration Program (IRP) established under DERP is a

comprehensive program to identify and address environmental contamination from past military operations. The IRP sites and areas of concern (AOCs) at BCANGB are discussed below.

Site 1 – Fuel Tank Farm

Located northwest of Building 6998 and south of Thunderbolt Avenue is the former fuel tank farm, IRP Site 1 (Figure 11). The fuel tank farm originally contained four 25,000-gallon (94,635-liter) aboveground fuel storage tanks surrounded by containment berms. Prior to 1949, the tanks were used for storage of gasoline. The tanks were not used between 1949 and 1973. From 1973 to 1974, the City of Battle Creek used the tanks for the storage of No. 4 heating fuel (Michigan ANG 1997). The site also includes a motor pool drainage ditch (formerly AOC-B). The site was closed in 2004.

Site 2 – Drainage Swale

Site 2 was a low-lying depression located in the northwest corner of the cantonment east of the railroad tracks and directly west of Building 6911 (Figure 11). The drainage swale received stormwater runoff from the northern half of the installation. Surface water in the drainage swale either evaporates or infiltrates into the ground. During the 1993 Site Investigation, toluene, fluoranthene, mercury, and zinc were detected in the surface water at Site 2 (Michigan ANG 2003a). During closure of the drainage swale, a sand cover was constructed over the swale to eliminate the threat of exposure to surface soil/sediment contaminants. The site was closed in 2004.

Site 3 – Fire Training Area

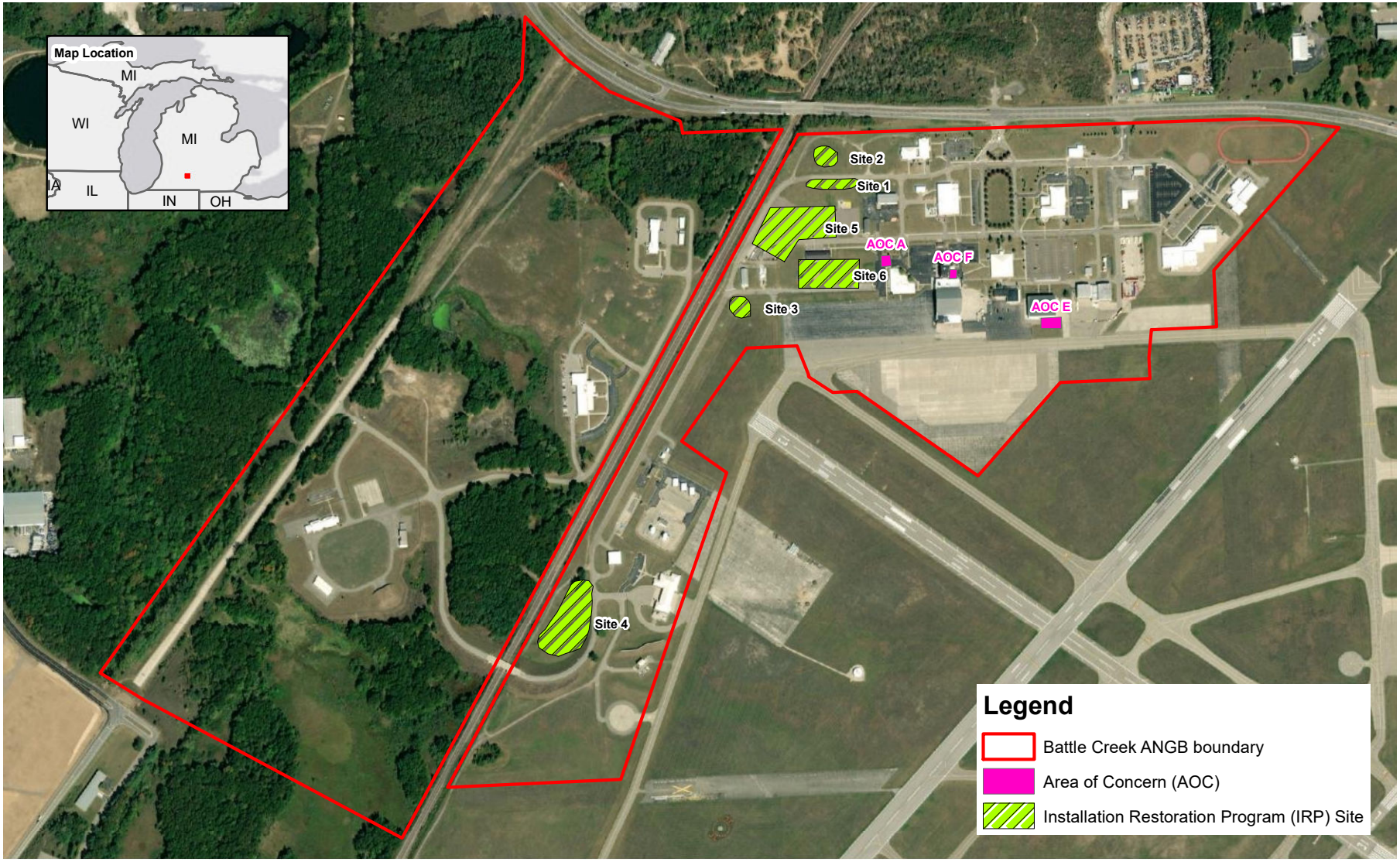
Site 3 was the Fire Training Area located in the central portion of the base southwest of the civil engineering storage area (Figure 11). Fire-training exercises were conducted at this site from 1977 to 1986. During this time, approximately 54,000 to 74,000 gallons (204,412 to 280,120 liters) of a mixture consisting of waste Jet Petroleum No. 4 (JP-4), waste oils, waste hydraulic fluid, and spent cleaning solvents were reportedly burned during fire-training exercises. The mixture of wastes floated on top of water, was ignited, and then extinguished (Michigan ANG 2002). Based on groundwater and soil samples no further action is warranted for the site and Site 3 was closed.

Site 4 – Abandoned Landfill

IRP Site 4 is the abandoned landfill located in the southwest portion of the installation (Figure 11). The abandoned landfill was used for the disposal of concrete and asphalt during runway repairs. Empty 55-gallon (208-liter) drums, 1-gallon (4-liter) paint cans, and large pieces of concrete and asphalt are present at the surface of the landfill (Michigan ANG 2003b). No information exists to indicate whether or not the drums and cans were empty at the time of disposal at the landfill. The state determined that no further remedial action was needed at the site in 2003.

Site 5 – Coal Storage Area

IRP Site 5, referred to as the Former Coal Storage Area, is located on the western side of the cantonment (Figure 11). A rail spur was used to transport coal into the storage area (Michigan ANG 2003c). Coal was previously stored in the area when the airfield was occupied by the U.S. Army Air Corps. The site was closed in 2004. IRP Site 5 includes restrictions on groundwater use (other than for monitoring), confirmation that no residential construction has occurred at the site, and a land transfer notification to notify potential future property owners that closure was to industrial standards (BB&E 2018). AOC-D was a former fire training area that contained waste oils, fuel, and solvents and this area has been incorporated into Site 5.



ANGB - Air National Guard Base

0 500 1,000 1,500 Feet

Figure 11. Installation Restoration Program Sites and Areas of Concern at Battle Creek ANGB

Site 6 – Fuel Spill Area

Underground fuel storage tanks located southeast of the former location of Building 6910 and north of the west parking ramp were used for storage of JP-4 (Figure 11). An electrical pumping system was used to transfer the fuel from the tanks to fuel trucks. On at least one occasion in the 1970s, approximately 2,000 gallons (7,571 liters) of fuel were reportedly pumped onto the ground due to an electrical system failure (Michigan ANG 2003d). Other spills of this magnitude reportedly may have occurred at this site. The state determined that no further remedial action was needed at the site in 2003.

AOC-A – Waste Accumulation Point

AOC-A consists of a grass-covered area east of Building 6910 (Civil Engineering Building; Figure 11). The area was reportedly used for waste collection and storage of POL and solvents prior to 1980. An estimated 20 to 100 gallons (76 to 379 liters) of waste accumulated in this area per month, with spillage estimated to be less than 5 gallons (19 liters) per month (BB&E 2018). AOC-A was closed in 1996; however, the Michigan Department of Environmental Quality (MDEQ; now EGLE) concurred that appropriate restrictions were in place that would be protective of human health and the environment. The land use controls at AOC-A include confirmation that no residential construction has occurred at the site and a land transfer notification to notify potential future property owners that closure was to industrial standards.

AOC-E – Building 6901 (Old Hangar)

Building 6901 was used, prior to the 1962 construction of the new hangar, for aircraft maintenance activities including vehicle maintenance activities, vehicle and aircraft part painting, and vehicle washing (BB&E 2018). Small quantities of waste were reportedly disposed of by pouring the waste on the ground. AOC-E (Figure 11) was closed in 1996; however, MDEQ concurred that appropriate restrictions were in place that would be protective of human health and the environment. The land use controls at AOC-E include confirmation that no residential construction has occurred at the site and a land transfer notification to notify potential future property owners that closure was to industrial standards.

AOC-F – Building 6900 (New Hangar)

The new hangar was built in 1962 and was used for aircraft maintenance. Reported waste disposal methods (prior to 1980) at the new hangar included disposal of small quantities of used solvent, paint waste, and POL in the dumpsters (BB&E 2018). Materials may have leaked from the dumpster. AOC-F (Figure 11) was closed in 1996; however, MDEQ concurred that appropriate restrictions were in place that would be protective of human health and the environment. The land use controls at AOC-F include confirmation that no residential construction has occurred at the site and a land transfer notification to notify potential future property owners that closure was to industrial standards.

7.0 NATURAL RESOURCES PROGRAM MANAGEMENT

7.1 Natural Resources Program Management

The guiding philosophy of the BCANGB 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 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 BCANGB 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 habitats and habitat corridors across the installation.

The DoD and the ANG encourage support of state WAPs 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 Michigan WAP. In addition, Michigan enacted the Endangered and Threatened Species Act of Michigan (Compiled Laws Annotated 324.36501-07) to govern and define the criteria for listing species in the state (MSU 2021c).

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). At this time, the DoD MOU is under review.

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

Deer (*Odocoileus virginianus*), American beaver (*Castor canadensis*), groundhogs (*Marmota monax*), thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*), house sparrows (*Passer domesticus*), and European starlings (*Sturnus vulgaris*) can be nuisance wildlife species on the installation. The 110 Civil Engineer Squadron is the office of primary responsibility in coordinating the removal of nuisance wildlife with support and assistance from the EM. Non-lethal and relocation removal methods are preferred. The biology and welfare of the animal(s) should be taken into consideration when coordinating timing of removal and removal methods.

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 BCANGB, 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

Three federally listed species were noted in Calhoun County and potentially occurring at BCANGB: the eastern massasauga, northern long-eared bat (*Myotis septentrionalis*; NLEB), and Indiana bat (*Myotis sodalis*). In addition, the monarch butterfly was recently listed as a candidate species. Although no federally listed bats were detected during the 2019 surveys, forested areas at BCANGB present some snags and other roosting opportunities for NLEBs and Indiana bats as well as non-listed bat species. Habitat for the eastern massasauga rattlesnake also occurs on the installation.

Northern Long-eared Bat: The NLEB was federally listed as threatened on April 2, 2015 due to declines in population caused by WNS. The bat is also listed in Michigan as a species of concern. The bat is distinguished from other *Myotis* species by its long ears. This medium-sized bat has a body length of 3.0 to 3.7 inches (76 to 94 millimeters) and a wing span of 8.9 to 10 inches (228 to 254 millimeters; USFWS 2016a). Adult bats can weigh between 0.18 and 0.28 ounces (5 and 8 grams). This migratory bat species hibernates from mid-fall through mid-spring in mines or caves and spends its summers in wooded areas (USFWS 2016b). Suitable spring staging/fall swarming habitat, which is most typically within 5 miles (8 kilometers) of a hibernaculum, consists of the variety of forested/wooded habitats where they roost, forage, and travel (USFWS 2016b). NLEBs roost underneath bark, in cavities, or in crevices of both live trees and snags (typically $\geq$ 3.0 inches [7.6 centimeters] diameter at breast height). NLEBs are known to use a wide variety of tree species

and a network of roost trees based on presence of cavities or crevices or presence of peeling bark (USFWS 2016b). The NLEB will also roost in buildings (Harvey et.al. 2011).

Tree-roosting bats prefer leafy sites, well covered above, but open below. They will often use camouflage by roosting in a clump of dead leaves (Harvey et. al. 2011). Roosting locations are often over 6 feet (1.8 meters) above the ground, and located on the edge of a clearing.

Figure 12. Northern long-eared bat

Photo courtesy of USFWS

The following management strategies for the NLEB are recommended:

- Ensure the use of pesticides on the base and in sensitive habitats is done in accordance with the product label at the lowest amount possible.
- Limit presence of off-road vehicles in known foraging habitat to the maximum extent feasible.
- Limit tree removal and trimming to outside the maternity season (May 1 to August 30) to the maximum extent feasible.
- Protect snags greater than 5 inches (13 centimeters) in diameter in early stages of decay, where they do not pose a safety hazard, particularly in the areas currently forested.
- Maintain vegetation along surface water features to reduce erosion of streambanks which serve as critical foraging areas.

Indiana Bat: The Indiana bat was federally listed as endangered on March 11, 1967 (41 *Federal Register* 17740) and critical habitat was designated on September 24, 1976 (41 *Federal Register* 41914). However, critical habitat does not occur on the installation. The bat is also listed as endangered by the state. This bat weighs 0.25 ounce (7.1 grams), has a body length of approximately 1.9 inches (4.8 centimeters), and has a wingspan between 8.9 and 11 inches (228 and 280 millimeters). Although this species is similar to other related bat species, it can be distinguished as the Indiana bat by comparison of characteristics such as the structure of the foot and color variations in the fur (USFWS 2006).

In the winter, Indiana bats hibernate in caves or sometimes abandoned mines. During the summer months, the bats migrate to summer habitat in wooded areas where they usually roost on dead or dying trees under lose bark. Primary roost trees are typically large (greater than 9 inches [23 centimeters] diameter at breast height) with loose, exfoliating bark and a high degree of solar exposure. Indiana bats feed on aquatic and terrestrial insects while foraging in forested stream corridors, upland and bottomland forests and wooded edges, forested wetlands, and impounded bodies of water at night (USFWS 2006 and 2008).

Figure 13. Indiana bat

Photo courtesy of USFWS

The following management strategies for the Indiana bat are recommended:

- Ensure the use of pesticides on the base and in sensitive habitats is done in accordance with the product label at the lowest amount possible.
- Limit presence of off-road vehicles in known foraging habitat to the maximum extent feasible.
- Limit tree removal and trimming to outside the maternity season (May 1 to August 30) to the maximum extent feasible.
- Protect snags greater than 5 inches (13 centimeters) in diameter in early stages of decay, where they do not pose a safety hazard, particularly in the areas currently forested.
- Maintain vegetation along surface water features to reduce erosion of streambanks which serve as critical foraging areas.

Eastern Massasauga Rattlesnake: The eastern massasauga is a small, thick-bodied rattlesnake listed as threatened by the USFWS and is a state species of concern. The average length of this light brown colored snake with large, light-edged chocolate brown blotches on its back is about 2 feet (0.61 meter). Eastern massasauga inhabit wet areas including wet prairies, marshes, and low areas along rivers and lakes, while also utilizing adjacent uplands during parts of the year (USFWS 2016c). The southwestern corner of BCANGB consists of an extensive marsh/emergent wetland bisected by a stream. Additionally, a few other smaller wetlands occur along the western boundary of the installation. The rattlesnake prefers small rodents and hunts its prey by sight, by feeling vibrations, by sensing heat given off by its prey, and by detecting chemicals given off by the animal (USFWS 2016c). The eastern massasauga depends on wetlands for shelter and food as well as nearby uplands and habitat loss, as well as intolerance for venomous snakes, contributed to the species' listing.

Figure 14. Eastern massasauga rattlesnake

Photo courtesy of USFWS

The following management strategies for the eastern massasauga are recommended:

- Ensure the use of pesticides on the base and in sensitive habitats is done in accordance with the product label at the lowest amount possible.
- Alter mowing practices after emergence (April-October) from hibernation. Consider mowing patterns that begin in the middle of a site and work outwards or a back and forth method to allow the snakes an escape mechanism.
- Use wildlife-safe materials for erosion control and site restoration. Avoid using erosion control products containing plastic mesh netting or other similar material that could entangle snakes.
- To increase human safety and awareness of the eastern massasauga rattlesnake, provide educational information including a MDNR video, for those implementing projects on the installation.

Monarch Butterfly: In 2020, the USFWS determined that listing the monarch under the ESA is warranted but precluded at this time by higher priority listing actions. With this finding, the monarch butterfly becomes a candidate for listing (USFWS 2021b). The monarch butterfly is also listed as a state species of greatest conservation need and was documented during the 2019 survey effort at BCANGB. The monarch butterfly can be found in a variety of habitats, especially those supporting milkweed plants (*Asclepias* sp.), the primary food source of the caterpillars. These butterflies feed on nectar sources found in grasslands, prairies, meadows, and wetlands. Monarch butterfly populations have declined more than 90 percent over the past 20 years (MDNR 2015). Herbicide and pesticide use as well as the loss of habitat supporting milkweed and adequate nectar sources have contributed to the decline of the species.

Figure 15. Monarch butterfly
Photo taken during 2019 surveys

The following management strategies for the monarch butterfly are recommended:

- Allow common milkweed to grow and potentially expand into field edges where feasible.
- Consider landscaping with native fall-blooming flowers and allowing the species to expand where feasible. This will also help attract other pollinators such as native bees.

At Risk Species: In addition to four listed species (NLEB, Indiana bat, eastern massasauga rattlesnake, and monarch butterfly), the USFWS National Listing Workplan (USFWS 2019) was reviewed to determine if any species documented at BCANGB could be considered "at risk". The species that are considered "at risk" have a timeline for a listing decision to be made in the next five years and conservation measures are recommended. Seven species are listed in Michigan by the USFWS as species at risk and have the potential to occur at BCANGB: tri-colored bat (*Perimyotis subflavus*), little brown bat (*Myotis lucifugus*), golden-winged warbler (*Vermivora chrysoptera*), Blanding's turtle (*Emydoidea blandingii*), spotted turtle (*Clemmys guttata*), wood turtle (*Glyptemys insculpta*), and frosted elfin butterfly (*Callophrys irus*). None of these species have been documented on the installation.

7.2.3.2 State Special Status Species

One state-listed avian species was observed during the 2019 surveys (BCANGB 2021a): trumpeter swan (*Cygnus buccinator*). In addition, the eastern box turtle (*Terrapene carolina carolina*), a species of special concern by the state, has been previously documented on the installation.

Trumpeter Swan: With a wing span over 6 feet (1.8 meters) in length and weighing greater than 25 pounds (11 kilograms), the trumpeter swan is the largest native waterfowl. Due to their size, the species require at least 100 yards (91 meters) to take off from the ground (Cornell 2019). Trumpeter swans prefer shallow, undisturbed bodies of freshwater with abundant aquatic plants for breeding areas. Diet for the species is mainly comprised of aquatic vegetation but the birds occasionally eat small fish, fish eggs, and insects. During the winter, terrestrial plants and grain crops are consumed in a higher percentage (Cornell 2019). Recommendations for protecting this threatened species include creating a no-activity zone to reduce human disturbance as well as to maintain wetland habitat (MSU 2020a). Swans are particularly sensitive to disturbance at the nest and will abandon nests and cygnets if disturbed.

Figure 16. Trumpeter swan
Photo courtesy of Eastside Audubon

The following management strategies for the trumpeter swan, a state threatened species, are recommended:

- Preserve wetland habitat.
- Ensure the use of pesticides on the base and in sensitive habitats is done in accordance with the product label at the lowest amount possible.

Figure 17. Eastern box turtle
Photo courtesy of Chesapeake Bay Program

Eastern Box Turtle: The eastern box turtle is Michigan's only terrestrial turtle typically occupying forested habitat near water sources (MSU 2020b). This small, turtle (4.5 to 6.6 inches [11.4 to 16.5 centimeters]) is named because a hinge on the lower shell allows it to enclose its head, legs, and tail completely within the upper and lower shells (NHSEP 2015). Box turtles hibernate from about October through April depending on the weather. Habitat destruction, mowing of early successional habitat during their active season, collection for pets, road mortality, and nest disturbance have contributed to the population decline.

The following management strategies for the box turtle, a state species of concern, are recommended:

- Where known to be present, leave unmowed field edges until after September 15. Peak time for use of fields by turtles is May 15 through September 15.
- Consider mowing patterns that begin in the middle of a site and work outwards or a back and forth method to allow the turtles an escape mechanism. Where practical and in known locations that support turtles, mow between 7 to 14 inches (28 to 36 centimeters) in height (NHESP 2015).
- Consider establishing nesting areas with soil scarification in safe areas, where feasible, to avoid migration into more dangerous areas.

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 minimizing impacts to special status species, BCANGB will:

- Update flora and fauna inventories every 3-5 years 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 BCANGB.
- Maintain existing forested areas, grasslands, and wetlands, and minimize disturbance in riparian and wetland buffers to the maximum extent feasible.

7.2.3.4 Climate Change and Special Status Species Vulnerability

Climate change vulnerability assessments are a means of preparing for and coping with the effects of climate change. Vulnerability is defined as the susceptibility of a species or habitat to the negative effects of climate change and other stressors (Boesch 2008). Climate change vulnerability for special status species is related to each species' expected exposure to climate change stressors, the sensitivity of that species to the stressors, and the adaptive capacity of the species to cope with the stressors related to climate change. Although not all species have been examined, Table 9 indicates which species have been identified as vulnerable to climate change according to the vulnerability assessment conducted by the MDNR (Hoving et al. 2013).

Table 9. Climate Change Vulnerability of Special Status Species

Species	Status	Climate Vulnerability
Northern long-eared bat (*Myotis septentrionalis*)	FT	Presumed stable
Indiana bat (*Myotis sodalis*)	FE	Moderately vulnerable
Eastern massasauga (*Sistrurus catenatus*)	FT	Highly vulnerable
Trumpeter swan (*Cygnus buccinator*)	T	Moderately vulnerable
Eastern box turtle (*Terrapene carolina carolina*)	Species of Special Concern (state)	Highly vulnerable
Monarch butterfly (*Danaus plexippus*)	FC Species of Greatest Conservation Need (state)	None

Source: Hoving et al. 2013

FE = Federally endangered FT = Federally threatened FC = Federal candidate T = Threatened (state)

7.3 Water and Wetland Resource Protection

Water resources on BCANGB consist of five wetlands, one unnamed stream that flows into Helmer Creek, a tributary of the Kalamazoo River, and two constructed stormwater catchment basins that regularly hold enough water to support various aquatic plants and animals. 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. BCANGB currently protects its water resources through compliance with a number of federal, state, and local environmental regulations that require the installation to comply with spill prevention control and countermeasures and to implement stormwater pollution prevention BMPs. 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 Clean Water Act (CWA; 33 USC 1251 et seq.) is the primary federal statute that protects the nation's waters. The intent of the CWA is to prevent, reduce, and eliminate pollution in the nation's waters for the purposes of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. WOTUS include, but are not limited to, coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, and wetlands. See 33 CFR Part 328.3(a) for the full list of WOTUS.

The three primary sections of the CWA that may affect day to day operations are Sections 404, 401, and 402. The USACE is the regulatory agency responsible for implementation of the CWA and the US Environmental Protection Agency (USEPA) has oversight over the CWA. Section 404 regulates the discharge of dredged or fill material into WOTUS, including wetlands. When impacts to WOTUS, including wetlands, cannot be avoided, a Section 404 permit must be obtained from the USACE. When a Section 404 permit is required, a Section 401 WQC from the state is also required.

Section 10 of the Rivers and Harbors Act (33 USC 403) regulates the placement of any obstructions in and the excavation or fill in any navigable WOTUS. The USACE is the regulatory agency responsible for implementation of the Rivers and Harbors Act.

Management of wetlands on federal lands, including military installations, is further governed by EO 11990, *Protection of Wetlands*, and DoDI 4715.03, *Natural Resources Conservation Program*. Under EO 11990 and DoDI 4715.03, wetlands are required to be managed for no net loss. This means short- and long-term impacts to WOTUS, including wetlands, must be avoided. If they cannot be avoided, the impacts must be minimized to the least environmentally damaging practicable alternative (LEDPA). When impacts cannot be avoided, they must be mitigated to ensure there is no net loss of acreage.

To obtain Section 404 and Section 10 permits and Section 401 WQC, applicants are, depending on the state in which the installation is located, required to submit permit applications to the USACE and the state agency responsible for implementation of Section 401 or through a Joint Permit Application. In Michigan, the state agency responsible for implementation of Section 401 is the EGLE. There are different types of Section 404 and Section 10 permits that include but are not limited to individual and Nationwide Permits. The specific type of permit is based on the total area of impact and the overall impact to the system. WQCs can be individual or they can be issued as part of a Nationwide Permit.

Applications for Section 404 permits must include an avoidance and minimization analysis that addresses the USEPA Section 404(b)(1) Guidelines (40 CFR Part 230.10). The analysis must demonstrate the effort made to first avoid the impacts and then the rationale for the selected LEDPA. The analysis must also demonstrate the impacts will not cause or contribute to violations of state water quality standards and the activity does not jeopardize listed species or sensitive cultural resources (33 CFR Part 320.3 [e] and [g]). The analysis must also identify mitigation requirements and the preferred alternative selected to meet mitigation requirements.

Wastewater, construction, stormwater, and pretreatment discharges, also known as point source discharges, are managed through the National Pollution Discharge Elimination System (NPDES) Permit Program as authorized by Section 402 of the CWA. EGLE implements Section 402 for the state of Michigan. All point source discharges must have a NPDES permit. NPDES permits require specific actions including monitoring and analysis work that must be conducted during the lifetime of the permit.

In 1984, Michigan was delegated Section 404 permitting authority for inland waterways within the state. Michigan's Section 404 permitting program is administered by the EGLE under Parts 301 (inland lakes and streams) and 303 (wetlands) of the Michigan Natural Resources and Environmental Protection Act. In accordance with the CWA, Section 404(g), the USACE retains federal jurisdiction over traditionally navigable waters, including the Great Lakes, connecting channels, other waters connected to the Great Lakes where navigational conditions are maintained, and wetlands directly adjacent to these waters. A joint state and federal permit application process has been established between EGLE and the USACE for projects proposed in areas which have both state and federal jurisdiction (EGLE 2021b). Wetland areas that are not contiguous to the Great Lakes, an inland lake or pond, or a river or stream; and are 5 acres (2 hectares) or less in size are not regulated by EGLE under Part 303.

In Michigan, the EGLE also administers the Section 401 WQC program. Section 401 WQCs are required for all projects that require a Section 404 that may result in a discharge to water bodies, including wetlands. The state may issue a WQC with or without conditions, or deny certification for activities that may result in a discharge to water bodies. The State of Michigan's Part 4 Rules, Water Quality Standards (Part 31, Water Resources Protection, of Act 451 of 1994), specify water quality standards which must be met in all waters of the state (EGLE 2021c).

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 national FIRM (e.g., changes to the floodplain boundary), BCANGB must submit an analysis reflecting those changes to 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. The EGLE administers the National Flood Insurance Program for the state of Michigan.

This INRMP focuses mainly on the potential impacts to water resources related to ground disturbance and stormwater associated with changes in impervious areas. BCANGB implements the following specific watershed protection measures:

- Obtaining a NPDES permit through EGLE (EGLE 2021d) for construction that disturbs greater than 1 acre (0.4 hectare) or is within 500 feet (152 meters) of a lake, wetland, or stream. Ensuring BMPs designated under the regulations are implemented.
- Obtaining a Section 404 permit and a Section 401 WQC prior to the commencement of any land disturbance. Mitigation may be required for the loss of acreage.
- Managing invasive species to promote desirable native species.
- Maintaining vegetated buffers around water resources.
- Restricting vehicles within 100 feet (30.5 meters) of water resources except where established crossings and roads exist, or when special access is required.
- Adhering to Michigan's Soil Erosion and Sedimentation Control laws and regulations during clearing, grading, construction and operational activities and as described in installation manuals, plans, and permits.

7.3.2 Coastal Management Zones

No coastal zone exists at BCANGB; therefore, no requirements have been established for a coastal zone program or management plan.

7.3.3 Vegetation Buffers

Vegetated buffers are also referred to as riparian management zones, riparian buffers, wetland buffers, lake buffers, buffer strips, filter strips, or streamside management areas. Buffers can take many forms and may vary in size and function depending on the upland land use and the type of water resource being protected. They can either be grassland or forest, and may or may not be mowed and maintained occasionally. One of the primary purposes of a vegetated buffer is for water quality protection by providing vegetation to interrupt water flow and to trap and filter out suspended sediments, nutrients, chemicals, and other polluting agents before they reach the body of water. Vegetated buffers should be maintained along all perennial and intermittent streams, wetlands, lakes, or ponds where nearby management activities result in surface/soil disturbance, earth changes, and where erosion and sediment transport occur during rain events. BCANGB will maintain riparian buffers around water resources to reduce the influx of sedimentation and other materials into the water resources.

7.4 Grounds Maintenance

BCANGB currently occupies 348 acres (141 hectares) of land which includes approximately 119 acres (48 hectares) of open space. The grounds maintenance personnel currently mow the grass in the maintained areas of the installation and conduct tree maintenance. 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 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, non-native species in revegetation and landscaping activities.
- Choose plantings with climate change resiliency in mind. 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 Wildland Fire Management

The threat of wildfire to the mission and natural resources is extremely low and a wildland fire management plan for BCANGB is not required.

7.6 Forest Management

Approximately 55.21 acres (22.34 hectares) of forested lands occur on BCANGB; however, 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. BCANGB will avoid removing trees during bird nesting season

(April 1 to July 31), bat summer roosting season (May 1 to August 30), and in other areas that are associated with state threatened or endangered species, and state species of special concern.

7.7 Soil Conservation and Sediment Management

The soils at the installation 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. Two main types of soil erosion exist: wind erosion and water erosion. Several factors affect water erosion. These factors include rainfall, slope steepness and length, soil texture or erodibility, cover protecting the soil, and special practices such as terracing or planting on the contour. Sediment resulting from erosion affects surface water quality and aquatic organisms. Soil types with high susceptibility for soil erosion on BCANGB include fine sandy soils like Alganesee fine sand and sandy loam Spinks and Oshtemo soils. 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 wetlands, 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.

BCANGB operates under an individual groundwater discharge permit (NPDES Permit Number MIS120000), which provides sampling, monitoring, and reporting requirements for stormwater discharges. Construction activities that disturb one or more acres or are within 500 feet (152 meters) of a lake, wetland, or stream are regulated under USEPA's NPDES construction stormwater program and would need a Construction Stormwater Permit. To protect water quality, BCANGB implements the following strategies:

- Monitoring surface water quality.
- Implementing BMPs for construction and industrial activities.
- Preventing surface water pollution by ensuring environmental plans (e.g. SWPPP) are implemented when appropriate.
- Minimizing the use of pesticides.
- Maintaining vegetation buffers around water resources.
- Re-seeding disturbed areas after construction with native grasses and plant species.

7.8 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 BCANGB.

7.9 Hunting Program

At the allowance of the Installation Commander, BCANGB implements a bow deer hunting program during Michigan's fall hunting season (October 1 - November 14) for BCANGB Service Members and employees only. In accordance with 10 USC § 2671, BCANGB ensures that hunting,

fishing, and trapping activities on the installation comply with all state fish and game laws. Installation hunting must also comply with federal laws and regulations, and be consistent with DoD principles for ecosystem management and biodiversity conservation (AFMAN 32-7003). The MDNR issues regulations for hunters in Michigan, including those who use BCANGB.

7.9.1 Permits and State Licenses

Each hunter is responsible for obtaining the appropriate Michigan hunting license before obtaining installation hunting permission. Personnel can receive installation hunting permits/permission from the 110 WG Safety Office after turning in their completed *Hunter's Responsibilities* form (Appendix C, Attachment 1) and the *Deer Hunting-Terms, Waiver and Release of Liability* form (Appendix C, Attachment 2). Currently, no fees are required to hunt on the installation. However, per AFMAN 32-7003, *Environmental Conservation*, if hunting fees were collected:

- All revenue collected from permit and license fees for hunting, fishing, and non-consumptive wildlife activities shall be maintained and used at the installation level to support wildlife and habitat management pursuant to Section 670a(b)(3) of the Sikes Act.
- BCANGB would use the same fee schedule for all participants, with the exception of senior citizens, children, and people with disabilities.

7.9.2 Check-in/Check-out Procedures

Upon arrival to the installation, hunters are required to physically check-in with the gate attendant by name, type of bow, and area that will be hunted prior to entering hunting areas. Hunting is allowed only outside of core duty hours (0800-1600) Monday-Friday. This check-in procedure also allows limits to be put on hunter density. Only harvesting of one deer per hunter within the hunting season dates is allowed.

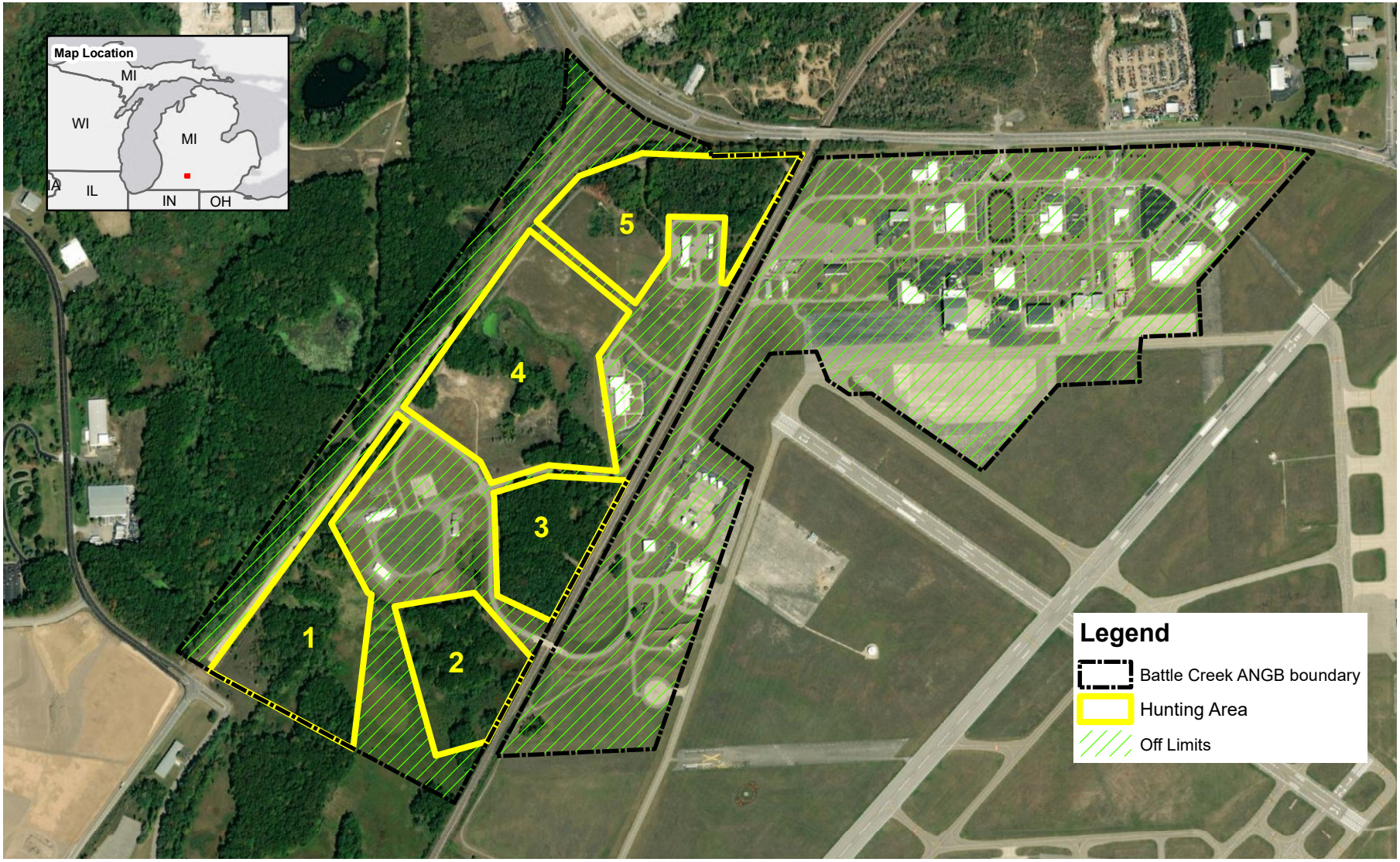
The installation has nuisance tag quotas agreed upon between the 110 WG and the MDNR for various seasons. Hunters must notify the gate attendant that they are off the hunting areas within 1.5 hours after official sunset. This check-out provides a safety check as well as allows the gathering of harvest data. Additionally, hunters must notify the Safety Office the following business day of a deer harvest, and the Safety Office will inform the Environmental Management Office (EMO) each time a deer is harvested when the Safety Office is made aware of the harvest.

Any issues that might arise during check-in/check-out will be addressed by the on call 110 WG Safety team or designee.

7.9.3 Access Areas

The BCANGB Hunting Map (Figure 18) is critical to hunter access to specific areas of the installation. This map is updated annually to ensure accuracy and is available at the 110 WG Safety Office. The map includes two types of areas:

- Hunting Areas – these areas are unrestricted areas on the installation for hunting.
- Off Limits Areas – these areas are designated by the Installation Commander as being off limits to recreational hunting by any person at any time.



ANGB - Air National Guard Base

Figure 18. Designated Hunting Areas on Battle Creek ANGB

7.9.4 Safety Considerations

Any person who wants to use BCANGB for hunting must attend a required hunter safety class provided by the Safety Office if directed by the Installation Commander. The class is not a substitute for any MDNR-mandated hunter safety courses, nor will the state course satisfy requirements for the BCANGB class.

7.10 Conservation Law Enforcement

The deer herd and hunting will be primarily managed by the Safety Office with assistance from the Base EMO and the MDNR. Hunter compliance with local and state regulations will be monitored by the Safety team or designee. The Safety Office coordinates with and receives deer hunting permits that are issued to hunters on the installation from the MDNR office at the Barry County State Game Area. Hunters that receive a deer hunting permit for the installation, must adhere to all federal and state laws and regulations as required by the hunting permit. Failure to do so will result in the loss of hunting privileges on the installation, and being reported to the MDNR Law Enforcement Division.

7.11 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.

7.12 Other Plans

7.12.1 Integrated Pest Management Plan

BCANGB follows its IPM Plan in an effort to control organisms that negatively influence human health or the environment while using sustainable practices. 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. Pesticides are applied by a certified pesticide applicator.

7.12.2 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 Michigan can be found from various sources:

- Michigan Invasive Species Program (MISP): https://www.michigan.gov/invasives/
- Michigan Department of Agriculture and Rural Development: https://www.michigan.gov/mdard/0,4610,7-125-2390_2443---,00.html
- US Department of Agriculture's (USDA's) Introduced, Invasive, and Noxious Plants: https://plants.usda.gov/java/noxious?rptType=State&statefips=24

The MISP identifies invasive species as watch list, prohibited, or restricted. Watch list species are described as an immediate threat to Michigan's natural resources; prohibited species are not common in the state yet; while restricted species are established in the state. The MISP provides education on preventing the introduction of non-native species, as well as management of established non-native species.

In total, eight invasive plant species as defined by the MISP (MISP 2019) and the USDA were observed at BCANGB (Table 10). Of these species, the most commonly observed were autumn olive (*Elaeagnus umbellate*), glossy buckthorn (*Frangula alnus*), garlic mustard (*Alliaria petiolate*), and Oriental bittersweet (*Celastrus orbiculatus*). While some occurrences of invasive plants are limited to locally abundant populations in relatively small areas and populations, four locations had recent disturbance across relatively large areas with larger populations of invasive species noted in the 2019 survey effort (BCANGB 2021a).

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. BCANGB's IPM Plan details the control of pest species.

Table 10. Invasive Species Observed During the Flora and Fauna Surveys

Scientific Name	Common Name	Status	Habitat Type(s) Observed
Ailanthus altissima	Tree-of-heaven	Invasive	Woodland
Alliaria petiolata	Garlic mustard	Invasive	Emergent wetland / Woodland
Berberis thunbergii	Japanese barberry	Invasive	Woodland
Celastrus orbiculatus	Oriental bittersweet	Invasive	Emergent wetland / Woodland
Cirsium arvense	Canada thistle	Noxious weed	Disturbed
Elaeagnus umbellata	Autumn olive	Restricted	Emergent wetland / Disturbed
Frangula alnus	Glossy buckthorn	Invasive	Emergent wetland / Woodland
Rosa multiflora	Multiflora rose	Invasive	Emergent wetland

Sources: USDA 2019; MISP 2019; BCANGB 2021a

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 pest management strategies are as follows:

- Controlling invasive and exotic species and noxious weeds through early detection and isolation of infested areas.
- Establishing and maintaining 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.
- Implementing BMPs to minimize land disturbances that favor invasion of non-native species and re-vegetating disturbed areas with native species.
- Avoiding pesticide use in and around wetlands and other surface waters.
- Avoiding use of invasive, non-native species in landscaping.

- Implementing judicious use of both non-chemical and chemical control techniques to achieve effective pest management that minimizes economic, health, and environmental risks. Emphasizing the use of mechanical, biological, and cultural control techniques; using chemical techniques sparingly with caution. Using chemical controls only after careful consideration of alternative controls.
- Educating site users.
- Ensuring 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.
- Ensuring pesticides used at BCANGB are stored in accordance with the product labels, their Safety Data Sheets, and in accordance with DoDI 4150.07, *Pest Management Program*, and federal, state, and local regulations.
- Ensuring the IPMC monitors contracts for pest management at BCANGB.
- Supporting the Battle Creek Executive Airport as needed in the management of the deer population and the impacts to the airport.

7.12.3 Stormwater Management

The state of Michigan has legal authority to implement and enforce the provisions of the CWA, while the USEPA retains oversight responsibilities. EGLE issued an NPDES industrial stormwater permit (NPDES Permit Number MIS120000) for special use area of environmental contamination at BCANGB effective from March 12, 2021 through April 1, 2026. Under this permit, the 110 WG manages stormwater collection and discharge in accordance with a SWPPP. The SWPPP provides engineering and management strategies designed to improve the quality of stormwater runoff from the installation and thereby improve the quality of receiving waters (BCANGB 2019). Construction activities which disturb one or more acres of land and have a point source discharge of stormwater to waters of the state (streams, rivers, lakes, and wetlands) are required to obtain a NPDES permit from EGLE's Water Resources Division. Construction projects that disturb greater than 1 acre (0.4 hectare), but less than 5 acres (2 hectares), or are within 500 feet (152 meters) of a lake or stream must also obtain a permit from the local Soil Erosion Permitting Entity unless covered under the Natural Resources and Environmental Protection Act Part 91/Soil Erosion Permit (EGLE 2021e).

7.12.4 Michigan Wildlife Action Plan

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

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 INRMP were developed through a thorough evaluation of the natural resources present on BCANGB in

accordance with AFMAN 32-7003, *Environmental Conservation*, 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 INRMP is implemented.

GOAL – Natural Resources Program Management (PM): 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: Ensure Environmental Management staff are trained in accordance with the requirements of AFMAN 32-7003. At a minimum, members of the EMO must attend the CECOS Natural Resources Compliance Course as part of their training requirements for implementation of the INRMP. When feasible, members of the EMO will attend the annual National Military Fish and Wildlife Association Training Workshop.

- OBJECTIVE PM2: Prepare a budget and identify project needs to implement the natural resources management program at BCANGB. Project needs are to be submitted to the NGB/A4VN NRPM for budget and contracting.

- OBJECTIVE PM3: Conduct an annual INRMP review meeting with internal stakeholders. The BCANGB EM will promote discussion with Installation Command, installation personnel, the IPMC, the Safety Office, and other internal stakeholders to identify operational needs relative to natural resources management. The EM will document, in writing, the discussions held and agreements made and will address the document at the annual meeting with the USFWS, state, and NGB/A4VN NRPM.

- OBJECTIVE PM4: Conduct an annual INRMP review meeting with the USFWS, the MDNR, the IPMC, the NGB/A4VN NRPM, and the Safety Office. The annual meeting can be conducted as an in-person meeting, via a teleconference, via Teams, or via email. The EM will present the status of the project actions taken over the previous year, any changes that occurred, and identify the project actions to be undertaken over the coming year. The EM will record the discussions held and the agreements made and will provide an attendance roster for attendees to sign. The EM will submit the written record and attendance roster to the attendees and will request review and concurrence with the documents provided. Receipt of written concurrence from the USFWS and the MDNR will constitute conclusion of the annual meeting.

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: Based on the findings contained in the Final Flora/Fauna Report (BCANGB 2021a), identify any additional surveys that are deemed necessary and resource and conservation management projects to be included in the annual work plans.

- OBJECTIVE FW2: Determine the intervals, typically 3-5 years, needed to ensure populations and conditions of flora and fauna species and their habitats are thriving.

- OBJECTIVE FW3: Maintain an updated inventory of plants and animals present on BCANGB.

- OBJECTIVE FW4: Work with grounds maintenance to determine beaver populations that may be affecting installation roadways and buildings. Support the Civil Engineer Squadron

in the development of a beaver management strategy to incorporate into the IPM Plan and methodology for removing beavers and their structures to prevent flooding.

- OBJECTIVE FW5: Determine if an aquatic reconnaissance survey is warranted.
- OBJECTIVE FW6: Develop installation pamphlets, posters, and fact sheets highlighting the fauna and flora found on BCANGB, drawing special attention to unique and special populations and habitats.
- OBJECTIVE FW7: Determine if an entomological survey is warranted.
- OBJECTIVE FW8: Develop an eastern box turtle conservation strategy; bring awareness to their presence, mark applicable roadways for safer crossings, and initiate a population study that could be conducted as a research project by an undergraduate or graduate student in order to determine relative abundance, key habitat utilization, seasonal movements, sex ratio, and other pertinent biological and life history information that assists in developing effective conservation strategies.

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 (BCANGB 2021a) for BCANGB, determine the presence of key habitats identified in the Michigan WAP, and develop conservation strategies to protect these areas.

GOAL – Invasive Species (IN): Establish survey and monitoring protocols to identify and address invasive, non-native, and noxious species. Implement an invasive and non-native species survey and plan.

- OBJECTIVE IN1: Based on the results of the Final Flora and Fauna Surveys (BCANGB 2021a) for BCANGB, determine what actions are needed to address the presence of non-native, invasive, and noxious species on the installation.
    - Work with the Barry, Calhoun, and Kalamazoo Counties Cooperative Invasive Species Management Area for assistance.
- OBJECTIVE IN2: Ensure pest management projects and invasive species projects undertaken by the Pest Management Office and the EMO are coordinated and provide mutual benefit.

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 Michigan's WAP.

- OBJECTIVE TE1: Using the Final Flora and Fauna Surveys (BCANGB 2021a) for BCANGB, 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 state and federally listed species.
- OBJECTIVE TE2: Annually review state and federal lists of endangered, threatened, and species of concern with potential to occur on the installation. Maintain current lists of federal and state species.
- OBJECTIVE TE3: Based on the Final Bat Report (BCANGB 2020) prepared for BCANGB, determine the intervals at which future bat surveys need to be conducted. Ensure all bat

surveys and other surveys look for all species not just threatened and endangered species. Surveys will be conducted in accordance with USFWS protocols.

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: Improve effectiveness of grounds maintenance to the overall ecosystem while also supporting wildlife species.
    - Explain the need for mowing to begin at the center of an area and to move out from the center to allow wildlife to flee in all directions and not become trapped in the center or to one side.
    - Avoid removing trees from May 1 to August 30 during summer bat roosting season.
- OBJECTIVE GM2: Ensure ground maintenance personnel are aware of where sensitive habitats are found on the installation and the locations where listed species are located to reduce impacts to those species.
- OBJECTIVE GM3: In the event of land disturbances or erosion, in cooperation with grounds maintenance personnel, 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, while taking climate change into consideration for making appropriate selections.
    - Monitor revegetation efforts for effectiveness and modify as needed.

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: Review all land disturbing activities proposed on the installation to ensure such work is done in accordance with applicable permits and other approvals required.
- OBJECTIVE WA2: Ensure all ground disturbance activities are conducted in accordance with state or local soil erosion and sediment control (SESC) laws and regulations to prevent erosion from disturbed areas causing sediment to enter waterways and/or wetlands.
    - Review Michigan's SESC program to determine feasibility of having Environmental and Grounds personnel attend SESC courses/trainings and having installation personnel become certified SESC inspectors.
    - Identify, inventory, and map areas of erosion and determine which areas pose a high risk for impacting WOTUS including wetlands, runways, roadways, and building foundations.
- OBJECTIVE WA3: Ensure SESC measures are implemented and maintained during all phases of construction and maintenance projects to prevent disturbed soils from entering into streams and wetlands onsite and adjacent to the base.

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

- OBJECTIVE WT1: Ensure the boundaries of WOTUS, wetlands, and floodplains identified on and adjacent to the installation are shown in a GIS data layer, all installation development and comprehensive plans, and in all educational materials developed for installation personnel, leadership, and visiting personnel.
- OBJECTIVE WT2: Educate key installation and visiting personnel when necessary on the processes for conducting the mission in and adjacent to delineated and mapped WOTUS, wetlands, and floodplains.
- OBJECTIVE WT3: Ensure the JD for the WOTUS, including wetlands, remains current. If not kept current, a new delineation and JD may be required.
- OBJECTIVE WT4: Review all land disturbing projects, including but not limited to all phases of construction, demolition, and maintenance projects utilizing the EIAP process to determine if the projects will impact WOTUS, including 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 and Section 401 WQCs to the USACE and EGLE.

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 11 through 15). 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 11. Work Plans FY 2023

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual	NGB	High
Complete annual review of the INRMP with installation stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and MDNR.	PM4	Annual	NGB	High
Review natural resource studies conducted at BCANGB to identify potential project/studies to be conducted.	FW1			Medium
Review federal and state listings for threatened, endangered, and species of greatest conservation need to maintain current lists of federal and state species.	TE2	Annual		High
Support IPMC in the implementation of the IPM Plan.	IN2	Ongoing	NGB	High
EM and State EM to attend CECOS Natural Resources Compliance Course.	PM1	Once		Medium
Conduct educational outreach and create signage to reduce turtle road mortality.	FW6	Ongoing		Low
Investigate and develop methodology for beaver management.	FW4	Ongoing	O&M	Medium
Develop conservation strategies to protect, maintain, and enhance federal/state threatened and endangered species and state species of greatest conservation need; beginning with trumpeter swan and eastern box turtle.	TE2	Ongoing		Medium

Table 12. Work Plans FY 2024

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with internal stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and MDNR.	PM4	Annual	NGB	High
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual	NGB	High
Continue to implement the educational outreach program for key installation and visiting personnel on conducting the mission in and adjacent to mapped WOTUS, wetlands, and floodplains.	WT2	Ongoing		Medium
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at BCANGB.	PM2	Annual		Medium
Conduct aquatic survey.	FW3	Once		Medium
Determine presence of key habitats identified in the Michigan WAP, and begin to develop conservation strategies to protect these areas.	VM1	Ongoing		High

Table 13. Work Plans FY 2025

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with internal stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and MDNR.	PM4	Annual	NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at BCANGB.	PM2	Annual		Medium
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Support the IPM Plan.	IN2	Ongoing		High
Conduct surveys for threatened and endangered species.	TE1	Once		Medium
Investigate the feasibility of increasing pollinator habitat.	TE1	Once		Low
Develop pamphlets, fact sheets, or posters highlighting flora and fauna, key habitats, and conservation efforts.	PM6	Ongoing	BCANGB	Low

Table 14. Work Plans FY 2026

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with internal stakeholders.	PM3	Annual	NGB	High
Complete annual review of the INRMP with USFWS and MDNR.	PM4	Annual	NGB	High
Continue to implement the educational outreach program for key installation and visiting personnel on conducting the mission in and adjacent to mapped WOTUS, wetlands, and floodplains.	WT2	Annual		Medium
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at BCANGB.	PM2	Annual		Medium
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Support the IPM Plan.	IN2	Ongoing		High
Determine if an entomological survey is warranted.	FW7	Ongoing		Medium
Conduct bat survey.	TE3	Once		Medium
Conduct threatened and endangered species and state species of greatest conservation need surveys.	TE1	Ongoing	NGB	High

Table 15. Work Plans FY 2027

Project	Objective	Frequency	Funding Source	Priority Level
Prepare budget to implement the natural resources management program.	PM2	Annual		High
Complete annual review of the INRMP with installation stakeholders.	PM3	Annual	NGB	Medium
Complete update of the INRMP with USFWS and MDNR.	PM4	Annual	NGB	High
Submit request to the NGB/A4VN NRPM to have studies/projects implemented at BCANGB.	PM2	Annual		Medium
Review federal and state listings for threatened, endangered, and species of concern to maintain current lists of federal and state species.	TE2	Annual		High
Review the INRMP, studies completed, and the written documents generated from the annual meetings to determine what updates and projects will be needed for the 5-year operations and effect review.	PM4	Once		Medium
Support the IPM Plan.	IN2	Ongoing		High
Conduct flora and fauna survey.	FW2	Once		Medium
Develop conservation strategies to maintain and improve biodiversity of non-listed/non-species of greatest conservation need fauna species.	FW3	Ongoing	O&M	High

10.0 INRMP IMPLEMENTATION, UPDATE, AND REVISION PROCESS

10.1 INRMP Implementation

In accordance with AFMAN 32-7003, *Environmental Conservation,* 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, MDNR, 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 BCANGB 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 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 key BCANGB 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 daily 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 BCANGB INRMP Implementation Analysis

Implementation of the BCANGB INRMP will be monitored by the EM in cooperation with the NGB A4VN NRPM 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 BCANGB training lands that 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, MDNR, 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 MDNR, and BCANGB 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's) 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 JDs
- 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 BCANGB. 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).
- BCANGB 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 MOUs, Memorandums of Agreement (MOAs), 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 BCANGB 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/IFAW 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 the Federal Aviation Administration, USAF, US Army, USEPA, USFWS, and USDA to address aircraft-wildlife strikes (2003).

10.1.5 Consultation Requirements

BCANGB 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 MDNR. Actions that fall under the jurisdiction of Section 401 and 404 of the CWA necessitate permitting from the EGLE.

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

10.2 Annual INRMP Review and Coordination Requirements

Per DoD policy, the BCANGB EM will review the INRMP annually, prior to September 30, in cooperation with the USFWS and MDNR to ensure the goals and objectives of the INRMP remain current. The standards used for this evaluation are set forth in DoDI 4715.03, *Natural Resources Conservation Program*, Enclosure 5. The installation's natural resources management progress will be determined based on information obtained annually that supports the focus areas in the DoDI 4715.03 through the USAF/NGB biannual environmental quality data calls. Prior to the annual meeting with the USFWS and the MDNR, the EM will schedule an internal stakeholders meeting with the Safety Office, the IPMC, and tenant organizations to obtain feedback on how implementation of the INRMP affected or did not affect their programs and to obtain any comments and recommendations they may have. Following the internal stakeholders meeting, the EM will prepare a summary of the actions taken in support of the INRMP over the past year, what actions were not completed with an explanation of why they were not implemented, and the actions planned for the coming year. The EM will send out invitations with the written summary to the USFWS, MDNR, NGB/A4VN NRPM, Safety Office, IPMC, and other entities deemed necessary to participate in an annual meeting held in-person, via a conference call, or via a Teams meeting to discuss the written review summary, to address any questions regarding implementation of the INRMP over the past year, and to discuss the proposed actions for the coming year. The EM will document the meeting with the invitation, an agenda, meeting minutes, and a sign-in roster of attendees. Following the meeting, the BCANGB EM will submit the documentation to the USFWS and the MDNR for their review and comment and for concurrence that the documentation reflects the discussions held and the agreements made during the annual meeting.

At this annual meeting the need for updates or revisions will be discussed. If updates are needed, BCANGB 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 BCANGB 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, BCANGB will specifically:

- Invite feedback from USFWS and MDNR on the effectiveness of the INRMP.
- Inform USFWS and MDNR 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 BCANGB. The review will be conducted by the three cooperating parties to include the Installation Commander responsible for the INRMP, the Supervisor of the USFWS Michigan Field Office, and Director of the MDNR. While these are the responsible parties, technical representatives generally are the personnel who 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 Michigan Field Office and MDNR. Once concurrence letters or signatures are received from the Supervisor of the USFWS Michigan Field Office and the MDNR Director, 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 MDNR concurrence on the revised INRMP is received. BCANGB 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 BCANGB military mission, USFWS, and MDNR concerns are adequately addressed, and the INRMP meets the intent of the Sikes Act.

11.0 ENVIRONMENTAL ASSESSMENT

11.1 Introduction

As discussed in Section 2.3.2, the adoption of this INRMP requires an EIAP in accordance with 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 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 Michigan ANG at BCANGB is proposing the implementation of this INRMP, to support the management of natural resources as prescribed by the Plan itself and to comply with the Sikes Act. 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 Michigan ANG 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 Michigan ANG's need to provide realistic training for Michigan ANG personnel in fulfillment of mission requirements while complying with environmental regulations and policies.

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

11.3 Proposed Action

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

11.4 No Action Alternative

The No Action Alternative is a continuation of operations as currently conducted. Currently there is limited environmental management of natural resources on the installation. Management efforts are currently limited to pest management. Species-specific management, habitat management including

wetland protection, and population trends through species surveys are not 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.

11.5 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, AFI 32-7061, *The Environmental Impact Analysis Process*, and AFMAN 32-7003, *Environmental Conservation*. This EA analyzes potential environmental effects associated with implementation of the Proposed Action and the No Action Alternative in the geographical area of BCANGB. The INRMP describes impacts of the military mission upon natural resources and means to mitigate these impacts. However, this INRMP does not evaluate Michigan ANG's military mission, nor does it replace any requirement for environmental documentation of the military mission at BCANGB. This INRMP presents information on the management of natural resources on BCANGB. It also discusses the setting, identifies known natural resources, describes the human environment that affects natural resources, and describes how BCANGB would manage resources to provide sustained military use, sustain ecological functions, and protect listed and other sensitive plant and wildlife species. Major emphasis would be placed on proactive management to reduce the potential for negative environmental impacts due to the installation military mission.

The BCANGB 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).

11.6 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 1501.9(f)(1)), 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; climate change; 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 soils, water resources, vegetation, wildlife, special status species, and land use are provided below. A tabular summary of these potential environmental impacts is also presented in Table 16.

11.6.1 Soils

Proposed Action

Sediment resulting from erosion affects surface water quality and aquatic organisms. Soil types with high susceptibility for soil erosion on BCANGB include fine sandy soils like Alganesee fine sand and sandy loam Spinks and Oshtemo soils. Michigan ANG 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 effects to the resource.

No Action

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

11.6.2 Water Resources- Surface Water and Waters of the US

Proposed Action

Implementation of the INRMP is expected to result in beneficial effects 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 effects. 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. Efforts to limit impacts in riparian/wetland areas on the installation and ensure vegetation buffers around these areas would reduce the potential for water quality degradation both in and downstream of the installation. The Proposed Action offers more effective protection and mitigation for damages incurred to water resources due to the Michigan ANG mission than does the No Action Alternative.

No Action

Under the No Action Alternative, BCANGB 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. Minor, short-term adverse effects would be expected. BCANGB would follow the stipulations outlined in their NPDES industrial stormwater permit.

11.6.3 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 the installation. 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, invasive species surveys, 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. The IPM Plan would still be implemented. However, in the absence of an INRMP and specific management objectives and practices, the No Action Alternative would likely emphasize reaction to problems rather than a proactive approach to natural resources management.

11.6.4 Wildlife

Proposed Action

Projects listed in the INRMP and management recommendations would provide beneficial effects to wildlife under the Proposed Action. As part of the Proposed Action, wildlife resources at BCANGB would be periodically quantified and evaluated, allowing for population monitoring and management. Wildlife surveys and support of the Michigan WAP would provide beneficial effects to regional biodiversity. Management actions such as migratory bird surveys, a hunting program, and habitat management would ensure that impacts on wildlife that may be caused by daily 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 state WAP would not be implemented. Consistent and long-term wildlife and ecological monitoring would not occur to track wildlife populations. 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.

11.6.5 Special Status Species

Proposed Action

Beneficial effects on special status species at BCANGB 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. The INRMP also includes specific recommendations for conducting species inventories, and managing special status species populations that are associated with BCANGB.

No Action

Special status 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, species of greatest conservation need, and biodiversity.

11.6.6 Land Use

Proposed Action

Implementation of the INRMP would have long-term beneficial effects on the natural environment within the installation and, over time, ensure the sustainability of Michigan ANG 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.

11.6.7 Summary of Environmental Consequences

Compared to the No Action Alternative, environmental conditions at BCANGB would be conserved or improved, and the safety of airfield property owned and operated by the City of Battle Creek would be improved as a result of implementing the proposed INRMP. Therefore, implementing the INRMP (i.e., the Proposed Action) is the Preferred Alternative.

Table 16. Summary of Potential Environmental Consequences

Resource Area	Environmental Consequence*	
	No Action Alternative	Preferred Alternative
Geology (Section 4.2)	No effect	No effect
Soils (Section 4.3)	Short-term adverse impact	Beneficial
Water Resources (Section 4.4 and 5.5)	Short-term adverse impact	Beneficial
Floodplains (Section 5.5.2)	No effect	No effect
Air Quality	No effect	No effect
Noise Environment	No effect	No effect
Climate (Section 4.1)	No effect	No effect
Vegetation (Section 5.2)	Long-term adverse impact	Beneficial
Fish and Wildlife (Section 5.3)	Long-term adverse impact	Beneficial
Special Status Species (Section 5.4 and 7.2.3)	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

11.7 Cumulative Effects

A cumulative effect is defined 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 BCANGB 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 beneficial effects on the natural environment. Over time, adoption of the Proposed Action would enable BCANGB 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 Michigan WAP. As development continues in areas adjacent to BCANGB, protection and conservation of natural resources within the boundaries of the installation will become more important. Measures enacted on BCANGB to prevent runoff, soil erosion, and degradation of wetlands will provide beneficial effects to the overall health of the Kalamazoo River watershed. 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.

11.8 Conclusion

The Proposed Action to implement the INRMP for BCANGB 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 adverse significant environmental or socioeconomic effects. Because no significant adverse 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 (FONSI) is appropriate.

APPENDIX A. REFERENCES

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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 § 122.26(b)(16) and 122.32(a)(1) – Stormwater Discharge
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)

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.

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.

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

Intergovernmental Review of Federal Programs (EO 12372) – structures the federal government's system of consultation with state and local governments on its decisions involving grants, other forms of financial assistance, and direct development.

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.

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.

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 32-7001 – Environmental Quality Programming and Budgeting
AFI 32-7060 – IICEP
AFI 32-7061 – The Environmental Impact Analysis Process
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

Executive Directive 2019-12, Responding to Climate Change

Executive Directive 2020-10, Building a Carbon-Neutral Michigan

Michigan Department of Natural Resources Director's Order No. FO-224.21, Regulations on the Take of Reptiles and Amphibians

Natural Resources and Environmental Protection Act 451 of 1994

APPENDIX C. HUNTING FORMS

ATTACHMENT 1

HUNTER'S RESPONSIBILITES

I _____will:
(Member's Name)
1. Follow the Michigan Department of Natural Resources (DNR) rules and regulations.
2. Have the appropriate harvest tags and stamps as required by the Michigan DNR.
3. Only hunt with Longbow, Re-curve bow, Crossbow and/or Compound bow.
4. Not bait.
5. Direct my fire inward and in the opposite direction of any perimeter fence and building.
6. Remain in the hunting area selected.
7. Remove any material generated by field dressing or stripping of harvest.
8. Hunt only outside of normal duty hours.
9. Report any harvested/wounded animal to Safety Office by the next duty day.
10. Report any possible wounded animal to Security Forces immediately.
11. Upon arrival to the installation report to the gate attendant my name, type of bow, and area that I will be hunting.
12. Only wear the appropriate fall arrest device (Full body harness) while hunting from an elevated tree platform.
13. Not permanently attach any elevated hunting platform to a tree or other surface.
14. Remove any elevated hunting platform the within the date selected.
15. Only Harvest ONE deer within the dates selected.
16. Will ensure authorized Concealed Carry Firearms are secured in vehicle prior to entering assigned hunting area.

_____ _____
(Printed Name) (Signature)

_____ _____
(Date) (Phone Number)

_____ _____
(Emergency Contact) (Emergency Phone Number)

ATTACHMENT 2

DEER HUNTING-TERMS, WAIVER AND RELEASE OF LIABILITY

In consideration of the 110th Wing, and its officers, employees, agents and volunteers, furnishing the privilege for me to hunt deer on base property, I agree as follows:

I agree to follow all Michigan laws relating to the hunting of deer. I will only use such equipment as is authorized under such laws and will only hunt using the manner and methods approved under such laws. I understand that my violation of any hunting laws or regulations will result in the loss of the privilege.

I agree to abide by any restrictions placed on this opportunity by base authorities and understand that those restrictions are subject to change at any time.

I acknowledge this opportunity is a privilege and my identity as a one who may participate in this privilege, establishes no claim of right to be able to hunt on the property except with the express permission and subject to any conditions placed on the privilege by base authorities. I acknowledge that base authorities may rescind the opportunity at any time for any reason.

I fully understand and acknowledge that: (a) risks and dangers exist in hunting deer: (b) my participation in such activities and/or use of the equipment involved in such activities may result in injury or illness including, but not limited to bodily injury, disease, strains, fractures, partial and/or total paralysis, death, or other injuries or illnesses that could cause serious disability (c) these risks and dangers may be caused by the negligence of the officers, employees, agents, or volunteers of the United States, State of Michigan, United States Air Force, Michigan Air National Guard and the 110 Wing, the negligence of the participants, the negligence of others, accidents, breaches of contract, the forces of nature, or other causes. These risks and dangers may arise from foreseeable or unforeseeable causes; and (d) by my participation in these activities and/or use of equipment, I hereby assume all risks and dangers and all responsibility for any losses and/or damages, whether caused in whole or in part by the negligence or other conduct of the officers, employees, agents, or volunteers of the United States, State of Michigan, United States Air Force, Michigan Air National Guard and the 110 Wing, or by any other person.

I, on behalf of myself, my personal representatives and my heirs hereby voluntarily agree to release, waive. discharge, hold harm less, defend and indemnify the United States, State of Michigan, United States Air Force, Michigan Air National Guard and the 110 Wing, its officers, employees, agents, or volunteers from any and all claims. suits or causes of action for bodily injury, property damage, wrongful death, loss of services or otherwise which may arise of out of my use of the property and hunting gear, hunting equipment, any device such as bow, crossbows, and knives or my participation in the activity above. I specifically understand that I am releasing, discharging and waiving any claims or actions that I may have presently or in the future for negligent acts or other conduct by the United States, State of Michigan, United States Air Force, Michigan Air National Guard and the 110 Wing, and its officers, employees, agents, or volunteers.

I HAVE READ THE ABOVE WAIVER AND RELEASE OF LI ABILITY AND BY SIGNING IT AGREE IT IS MY INTENTION TO EXEMPT AND RELIEVE THE U NITED STATES, STATE OF MICHIGAN, UNITED STATES AIR FORCE, MICHIG AN AIR NATIONAL GUARD AND THE 110 WING, AND ITS OFFI CERS, EMPLOYEES, AGENTS AND VOLUNTEERS FROM LIABILITY FOR PERSONAL INJURY, PROPERTY DAMAGE OR WRONGFUL DEATH CAUSED BY NEGLIGENCE OR ANY OTHER CAUSE.

_____ _____

(Printed Name) (Signature)

(Date)

Instructions: A copy of the signed waiver will be provided to the participant. The original will be on file at 110 Wing Safety Office