Volume 1

Draft Final Environmental Assessment for Modification of Duke Military Operations Area

Maryland Air National Guard

175th Wing, Martin State Air National Guard Base

March 2023

Guarding America - Defending Freedom

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**ENVIRONMENTAL ASSESSMENT FOR
MODIFICATION OF
DUKE MILITARY OPERATIONS AREA**

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ACRONYMS AND ABBREVIATIONS

104 FS	104th Fighter Squadron
175 WG	175th Wing
ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AFI	Air Force Instruction
AFMAN	Air Force Manual
AGL	Above Ground Level
AHAS	Avian Hazard Advisory System
AI	Air Interdiction
ANG	Air National Guard
AOPA	Aircraft Owners and Pilots Association
APE	Area of Potential Effect
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
BAM	Bird Avoidance Model
BASH	Bird/Wildlife Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
CAS	Close Air Support
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CSAR	Combat Search and Rescue
DAF	Department of the Air Force
DAFI	Department of Air Force Instruction
DAFMAN	Department of Air Force Manual
dB	decibels
dBA	A-weighted decibels
DEP	Department of Environmental Protection
DNL	day-night Sound Average Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAC	forward air control
FL	Flight Level
FONSI	Finding of No Significant Impact

ft	feet
GHG	Greenhouse gases
IFR	Instrument Flight Rules
IR	Instrument Route
LASDT	Low Altitude Step Down Training
Ldnmr	onset-adjusted monthly DNL
Leq	equivalent sound level
Lmax	maximum sound level
MACA	Mid-Air Collision and Avoidance
MBTA	Migratory Bird Treaty Act
MOA	Military Operating Area
MSL	Mean Sea Level
MTR	Military Training Route
NAS	National Airspace System
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NM	nautical mile
NOTAM	Notice to Air Missions
NRHP	National Register of Historic Places
OSHA	Occupational Safety & Health Administration
OCA-AO	offensive counter air – attack operations
PA DCNR	Pennsylvania Department of Conservation and Natural Resources
PDARS	Performance Data and Reporting System
PGC	Pennsylvania Game Commission
RAP	Ready Aircrew Program
RNAV	area navigation
ROI	region of influence
SAT	Surface Attack
SEL	sound exposure level
SNM	square nautical mile
SUA	Special Use Airspace
tpy	tons per year
U.S.	United States
USAF	United States Air Force
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VFR	Visual Flight Rules
VR	Visual Route

1.0 INTRODUCTION

This Environmental Assessment (EA) was prepared to consider the potential impacts to the human and natural environment associated with the modification of the Duke Military Operations Area (MOA) to establish low-altitude airspace for the Maryland Air National Guard (ANG) A-10C Squadron to train and prepare for current and future conflicts. The ANG is a Directorate within the National Guard Bureau (NGB). The ANG Director assists the Chief of the NGB to carry out the functions of the NGB as they relate to the national defense directives of the United States (U.S.) (Department of Defense [DoD] 2015). Per amendments to 10 U.S. Code (U.S.C) 10501, described in the DoD Directive 5105.77, the NGB is a joint activity of the DoD. The NGB serves as a channel of communication and funding between the Air Force and State ANG organizations in the 54 U.S. states, territories, and the District of Columbia.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] §§1500–1508) (2022), the Air Force Environmental Impact Analysis Process (EIAP) (32 CFR 989), and the Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures*. This EA also identifies applicable management actions and best management practices that would avoid or minimize effects relevant to the Proposed Action.

As described in 32 CFR 989 and FAA Order 1050.1F, the NEPA process is intended to provide the Department of the Air Force (DAF) and the FAA planners and decision-makers with a meaningful review of environmental considerations associated with a given action. The analysis set forth in this EA allows the decision-makers to carefully balance the protection of these environmental resources while fulfilling the Air Force's essential roles, including training to prepare for current and future conflicts. Both environmental staff and military personnel within the ANG and the NGB were consulted and provided guidance on the development of this EA. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project and be available to inform decision-makers of the potential environmental effects of selecting the Proposed Action, reasonable alternatives, or No Action Alternative.

1.1 BACKGROUND AND LOCATION

The Maryland ANG, 175th Wing (175 WG) is stationed at Martin State (also known as Warfield) Airport near Baltimore, Maryland. The Eastern Area Defense Sector is tasked with the scheduling, management, and maintenance of ANG-assigned Special Use Airspace (SUA) and Military Training Routes (MTRs) in the Northeast U.S. The Eastern Area Defense Sector requires low-altitude airspace to provide ANG units an environment to accurately train and prepare for current and future conflicts. The 175 WG is one of the primary users of the Duke MOA. The mission of the Maryland ANG is to provide air combat forces and theater airlift aircraft to America's Unified

Combatant Commands. Under its federal mission, the 175 WG is assigned to the Air Combat Command and is tasked with carrying out missions compatible with training, mobilization readiness, humanitarian and contingency operations worldwide. The 104th Fighter Squadron (104 FS) is a unit of the 175th Operations Group.

The A-10C is responsible for a variety of missions including Offensive Counter Air – Attack Operations (OCA-AO), Combat Search and Rescue (CSAR), Close Air Support (CAS), Forward Air Control (FAC), Air Interdiction (AI), and Surface Attack (SAT). Each of these mission sets requires the use of low altitude airspace.

The proposed Duke Low MOA would modify the existing altitudes within the Duke MOA to establish low-altitude airspace. It is described in detail in Chapter 2, *Description of Proposed Action and Alternatives*. **Figure 1-1** depicts the existing Duke MOA beginning at 8,000 feet (ft) mean sea level (MSL), or the altitude above mean sea level as defined by altimeter instrumentation. The existing Duke MOA, covering 2,178 square nautical miles (SNM), is located in Pennsylvania and a portion of southern New York (**Figure 1-2**). The MOA is primarily located within Pennsylvania. The underlying counties include parts of Elk, Cameron, Clinton, McKean, Potter, and Tioga. A small fraction of the northwest corner of the MOA overlies portions of Cattaraugus and Allegany counties in New York. The existing Duke MOA does not provide adequate airspace for low level training to meet the training requirements of the 175 WG.

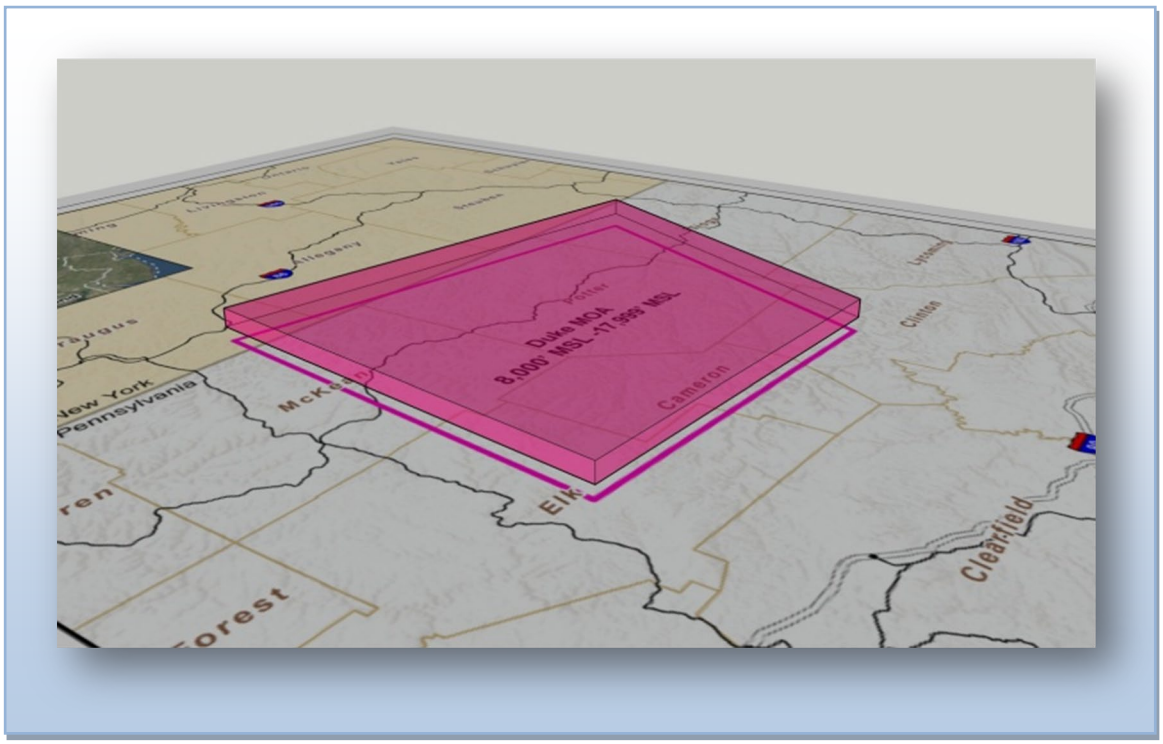

Figure 1-1. Existing Duke MOA Beginning at 8,000 ft MSL

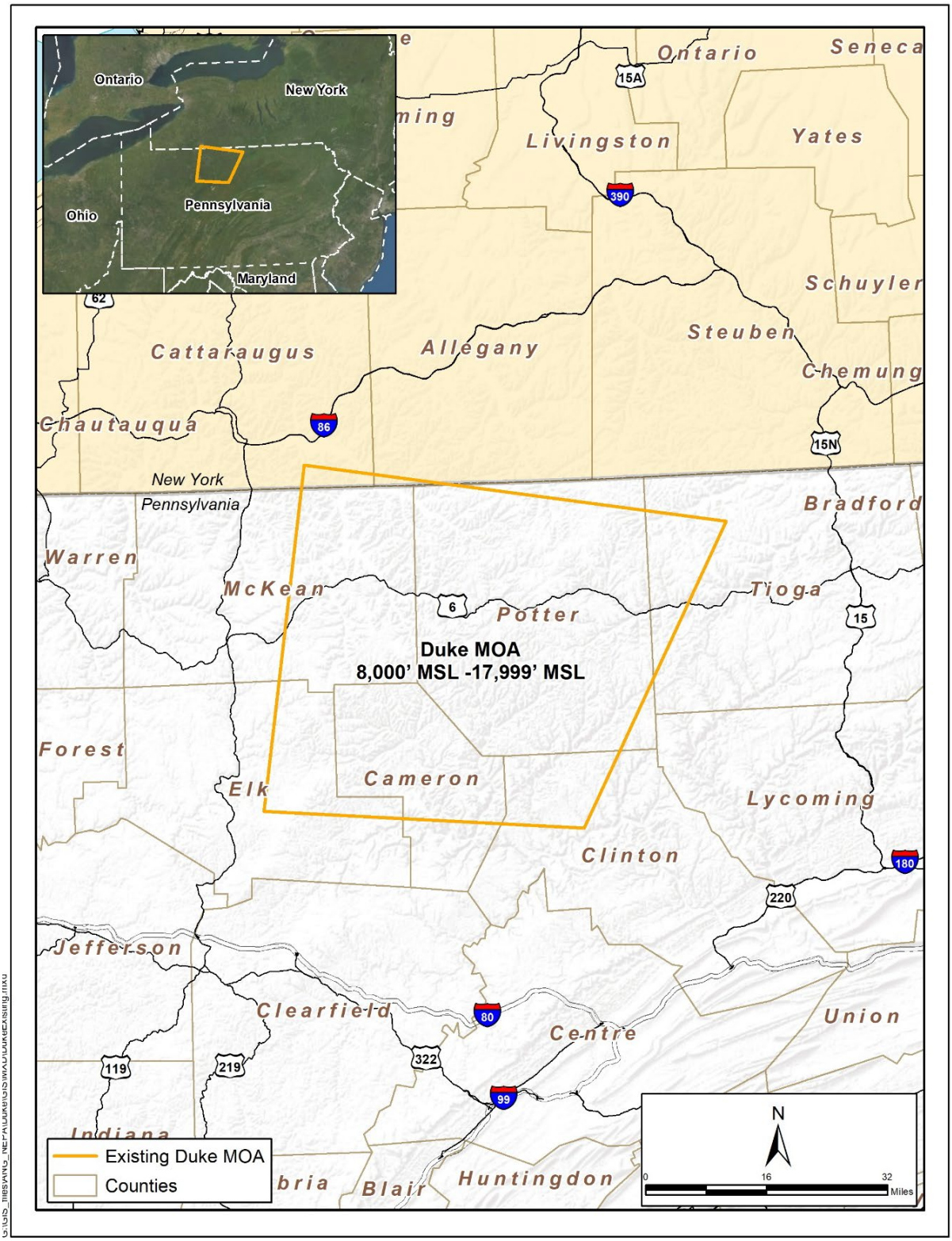

Figure 1-2. Existing Duke MOA

1.2 SPECIAL USE AIRSPACE OVERVIEW

The FAA Pilot's Handbook of Aeronautical Knowledge identifies four types of airspace in the National Airspace System (NAS): controlled, uncontrolled, special use, and other. These types of airspace are defined by the complexity or density of aircraft movements, nature of the operations conducted within the airspace, the level of safety required, and national and public interest. The primary focus of this EA is on SUA, specifically MOAs. SUA is the designation for airspace in which certain activities must be confined, or where limitations may be imposed on aircraft operations that are not part of those activities. **Section 3.1** *Airspace Management* describes airspace in detail.

MOAs consist of three-dimensional airspace with defined vertical and lateral limits. MOAs are established for separating certain military activities from civilian aircraft being operated under Instrument Flight Rules (IFR). Aircraft operated under IFR are operating with a clearance and under positive control of the FAA Air Traffic Control (ATC). MOAs are depicted graphically on FAA sectional charts. Additional MOA Information provided on the chart consists of upper limit elevation, lower limit elevation, activation method, hours of activation, controlling agency, and the using agency.

1.3 PURPOSE AND NEED

The purpose of the proposed action is to modify the existing altitudes within the Duke MOA to establish low-level airspace beneath the existing Duke MOA to train and prepare military pilots and aircrews for current and future conflicts. The action provides reasonable flexibility for aircrew usage and ATC de-confliction. A-10C aircrews must be able to train effectively and accurately by simulating all types of weapons and mission sets. In a close air support environment, diving weapon delivery profiles span the altitudes between 100 ft and 15,000 ft above ground level (AGL). The A-10Cs regularly descend to 1,500 ft AGL during a guns or rocket delivery. Aircrews must be proficient in the gun as it is the aircraft's primary weapon. Aircrews also regularly train for missions that have them operating below medium and low weather decks, fly at low altitudes during search patterns for isolated personnel, conduct threat reactions against simulated threats, and finding targets visually. The 175 WG cannot train to realistic threat or target scenarios in the existing Duke MOA because the airspace begins at 8,000 ft MSL (approximately 6,000 to 7,000 ft AGL or the distance above the ground).

The need for the action is to accommodate 175 WG training requirements for a reliable and realistic training environment in which to conduct upgrade and continuation training for aircrews in accordance with Air Force Manual (AFMAN) 11-2A-10Cv1, *Aircrew Training*, and A-10C Ready Aircrew Program (RAP). AFMAN 11-2A-10Cv1 specifies Low Altitude Step-Down training (LASDT) requirements for pilots to fly at altitudes below 500 ft AGL. The 175 WG currently has 29 pilots qualified for low-level flight operations and slightly more than half (58 percent) of 104 FS pilots have been qualified for low level flight down to 100 ft AGL. Approximately 20 percent

of the total pilots in the 175 WG and 104 FS are deficient in meeting this requirement. Some pilots arrive at the 175 WG qualified for low-level flight down to 100 ft AGL. These pilots received their qualifications while on active duty at airfields with access to low altitude airspace. Other pilots trained within airspace that is no longer accessible to the 175 WG, such as the Barry M. Goldwater Range in Arizona. None of the pilots at the 175 WG are able to remain proficient in low level flight, as they lack the airspace to train at the altitudes necessary to maintain their qualifications.

According to the A-10C RAP Tasking Memorandum, Aviation Schedule for 2020, a CSAR qualified pilot is required to fly six CSAR training missions during the fiscal year. CSAR is a simulation of operations that are carried out within or near combat zones by a task force of helicopters, ground-attack aircraft, aerial refueling tankers and an airborne command post. There are currently 20 CSAR-qualified pilots. Based on the requirements for CSAR, the 175 WG is required to fly 120 CSAR training missions (20 pilots x 6 missions) each year, which is more than the total number of sorties the 175 WG was able to schedule in 2017, in available low altitude airspace.

Aircrews also train for low altitude missions that require operating below medium and low weather decks, search patterns for isolated personnel, threat reactions against simulated threats, and finding targets visually. The 175 WG has previously utilized airspace at Davis Monthan Air Force Base (AFB), Arizona and altitude reservation in the Duke MOA and R-4006 for low altitude training; however, these airspaces are no longer available. The proposed Duke Low MOA would provide a reliable and effective airspace to complete required training. A-10C aircrews must be able to train by simulating all types of weapons delivery and mission sets. A-10C pilots require low-level flight operations in order to maintain pilot proficiency requirements. As pilots gain experience, they upgrade to a flight lead, forward air controller, search and rescue pilot, and more, they train to lower altitudes. Once pilots are trained at and qualified to those lower altitudes, they still need to train to adequately meet the mission requirements. Pilots are expected to maintain proficiency in all qualifications or continue to upgrade their qualifications as they gain experience. The Proposed Duke Low MOA would also be utilized to ensure all 175 WG A-10C pilots can achieve and maintain required qualifications. All pilots receive the same training and constant upgrades and specialized training continue throughout a pilot's flying career. The failure to create adequate training airspace will result in training shortfalls and a lack of combat readiness necessary in today's environment. The

This EA uses sortie, operation, and event to describe different components of aircraft flying activities as follows:

Sortie: a single military aircraft flight from take-off through final landing. A sortie can include more than one operation.

Operation: regarding airspace, an operation is the use of one airspace unit (e.g., MOA) by one aircraft. Each time a single aircraft flies in a different airspace unit, one operation is counted toward the utilization of that airspace unit.

Event: specific training element (e.g., supersonic flight). More than one event may be performed during the use of an airspace unit. During a single sortie, aircraft could fly in several airspace units, conduct several operations, and events.

Duke Low MOA would provide the 175 WG with suitable airspace required to meet DAF low altitude flight training and the ability to ensure pilot readiness for current and future mission needs.

1.4 SUMMARY OF ENVIRONMENTAL STUDY REQUIREMENTS

1.4.1 National Environmental Policy Act

NEPA and the CEQ regulations require federal agencies to analyze the potential environmental impacts of Proposed Actions and alternatives and use those analyses in making decisions on whether and how to proceed with those actions. These regulations specify that an EA be prepared to (1) provide sufficient analysis and evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a finding of no significant impact (FONSI); (2) aid in an agency's compliance with NEPA when an EIS is not necessary; and (3) facilitate preparation of an EIS when necessary. The amended NEPA regulations were implemented in May 2022 to facilitate more efficient, effective, and timely NEPA reviews.

The EIAP is the DAF's process for conducting environmental impact analyses, as promulgated at 32 CFR 989. To comply with NEPA and other relevant environmental requirements (e.g., the National Historic Preservation Act [NHPA], Endangered Species Act [ESA], etc.) and to assess potential environmental impacts, the EIAP and decision-making process for the Proposed Action involves an examination and analysis of environmental issues pertinent to the proposed modification to the Duke MOA, in the form of this EA.

Although the Secretary of the Air Force or their designated representative will decide whether to implement the Proposed Action, the FAA has final authority for approving or denying any proposal to modify, expand, or establish SUA (e.g., MOAs and Restricted Areas).

1.4.2 Lead and Cooperating Agencies

The NGB is the lead agency for this EA pursuant to 40 CFR 1501.7 and 1508.1. The Proposed Action includes activities associated with SUA; therefore, the NGB requested and received the FAA's cooperation in accordance with the guidelines described in the Memorandum of Understanding between the FAA and the DoD concerning SUA Environmental Actions, dated 4 October 2005 (Appendix 7 updated in October 2019). The NGB requested that the FAA participate as a cooperating agency in various portions of the EA development, including (1) early review of the Proposed Action and Draft EA; (2) assuming responsibility, upon request, for developing information and preparing analyses on issues for which FAA personnel have special expertise; and (3) making FAA staff support available to enhance interdisciplinary review capabilities. Details regarding the process of interaction between the NGB and the FAA are described further in **Appendix A**, *Agency Coordination,* within the cooperating agency letter.

1.4.3 Federal Aviation Administration Guidelines

The FAA is responsible for managing navigable airspace for public safety and ensuring efficient use for commercial air traffic, general aviation, and national defense, including SUA utilized by the DoD. Consequently, the FAA is the final decision-making authority regarding modification or establishment of airspace. FAA Order JO 7400.2N Chg 1 (FAA 2021), *Procedures for Handling Airspace Matters* provides guidance to air traffic personnel to assist in applying the requirements in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, to air traffic actions. FAA Order 1050.1F provides the FAA with policies and procedures to ensure agency compliance with NEPA and implementing regulations issued by the CEQ. FAA Order 1050.1F identifies impact categories to be considered during the NEPA process. **Sections 1.4** and **1.5** contain a list of each of the resources as prescribed by FAA Order 1050.1F, the associated sections within this EA where each is discussed, or the reason for excluding it from detailed analysis. This EA has been prepared in accordance with FAA Order 1050.1F.

In addition, FAA Order 1050.1F defines the thresholds for "significant" noise impacts and the thresholds for "reportable" noise impacts. To make certain the ANG is meeting FAA requirements, during the release and transmittal of the Draft EA, the ANG will "report" any 5 A-weighted decibel (dBA) day-night sound level (DNL) increase for areas with greater than 45 dBA DNL. Reportable threshold also includes a 3 dBA in DNL for areas exposed to between 60 and 65 dBA DNL. In addition, increases noise levels by more than 1.5 dBA DNL in a noise sensitive area exposed to noise above 65 dBA DNL would be considered significant.

1.4.4 Intergovernmental and Stakeholder Coordination

Through intergovernmental, agency and public scoping, the ANG provided opportunities for the public to participate in the NEPA process to promote open communication and improve their decision-making process. All persons and organizations identified as having potential interest in the Proposed Action are encouraged to participate in the process.

Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental effects. NEPA, the CEQ regulations, and 32 CFR 989 requires public review of the EA before approval of the FONSI and implementation of the Proposed Action. The ANG notified relevant federal, state, and local agencies in 2019 and 2021 and allowed them 30 days to make known their environmental concerns specific to the Proposed Action. Similarly, consultation letters were sent to the federally recognized tribes to provide notification of the action and to initiate government-to-government consultation in accordance with Section 106 of the NHPA, *Agency and Public Coordination,* and Department of Air Force Instruction (DAFI) 90-2002, *Interactions with Federally Recognized Tribes*, Tribal coordination was done through certified mail; follow-up phone calls to tribal recipients were conducted at 2 weeks and at 2 months after receipt verification to ask if there are any questions or concerns regarding the Proposed Action. Comments and concerns submitted by

these agencies are subsequently incorporated into the analysis of potential environmental impacts conducted as part of the EA. Several responses were received from private citizens during the public scoping period. Those comments have been incorporated into the Final EA.

Pursuant to 40 CFR 1501.6(a)(1) and 32 CFR 989.15(e)(2)(v), a Draft EA and unsigned FONSI are made available for public review for at least 30 days before FONSI approval and implementation of the action. However, the initial public comment period was set at 45 days. In light of public interest in the proposed project, the public comment period was further extended to more than 60 days to allow for maximum participation. The public comment period for the Draft EA was initiated on 27 October and ended on 31 December 2021. A Notice of Availability for the public review of the Draft EA was published in the following newspapers from 27 through 30 October 2021, 9 through 12 November 2021, and 2 through 26 December 2021.

- Bradford Era, McKean County (10/29, 11/12, and 12/10)
- Potter Leader-Enterprise, Potter County (10/28, 11/11, and 12/2)
- Endeavor News, Potter County (10/30, 11/13, and 12/26)
- Cameron County Echo, Cameron County (10/27 and 11/10)

The Draft EA was made available for public review at the following libraries:

- Bradford Area Public Library, Bradford, PA
- Coudersport Public Library, Coudersport, PA
- Green Free Public Library, Wellsboro, PA
- Galeton Public Library, Galeton, PA

The Draft EA and unsigned FONSI were made available and distributed upon request to federal, state, and local agencies as well as regional libraries to invite public participation. More information is available on the 175 WG's webpage at https://www.175wg.ang.af.mil/. Copies of agency correspondence are provided in **Appendix A**.

Given the substantial revisions to the document based on public and agency comments, a second 45-day public comment period was initiated to allow the public and agencies an opportunity to review the Draft Final EA. The public comment period for the Draft Final EA was initiated on 3 April 2023 and ended on 17 May 2023. A Notice of Availability for the public review of the Draft Final EA was published in the following newspapers from 3 through 8 April 2023, and 17 through 22 April 2023.

- Bradford Era, McKean County (4/3 and 4/17)
- Potter Leader-Enterprise, Potter County (4/6 and 4/20)
- Endeavor News, Potter County (4/8 and 4/22)
- Cameron County Echo, Cameron County (4/5 and 4/19)

The Draft Final EA was made available for public review at the following libraries:

- Bradford Area Public Library, Bradford, PA
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The Draft Final EA and unsigned FONSI were made available and distributed upon request to federal, state, and local agencies as well as regional libraries to invite public participation. More information is available on the 175 WG's webpage at https://www.175wg.ang.af.mil/. Copies of agency correspondence are provided in **Appendix A**.

1.4.5 Cultural Resources

The NHPA of 1966 (54 U.S.C. §300101 et seq.) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation (ACHP). The ACHP was tasked with, and provided, procedures for the management of Historic Properties on federal land (36 CFR 800). Historic Properties are generally defined as cultural resources, including archaeological remains, architecture, and traditional cultural places that are listed in or eligible for listing in the NRHP. Section 106 of the NHPA requires federal agencies to consider potential effects of their undertakings to Historic Properties and require the federal agency to consult with the appropriate State or Tribal Historic Preservation Office.

The Archaeological Resources Protection Act of 1979 (16 U.S.C. § 470aa-mm) was enacted to protect archaeological resources on public and Native American lands and encourage cooperation and exchange of information between governmental authorities, professionals, and private individuals. The act establishes civil and criminal penalties for destruction and alteration of cultural resources.

The American Indian Religious Freedom Act (42 U.S.C. 1996) established federal policy to protect and preserve the rights of Native Americans to believe, express, and exercise their traditional religions, including providing access to sacred sites.

1.4.6 Endangered Species Act (ESA)

The ESA of 1973 (16 U.S.C. §§1531-1544, as amended) established measures for the protection of plant and animal species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects of their Proposed Actions through a set of defined procedures, which may include the preparation of a Biological Assessment and can require formal consultation with the USFWS under Section 7 of the Act.

1.4.7 Other Executive Orders

EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,* aims to improve public health and protect our environment. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, provides that citizens in either of these categories are not disproportionately affected by a federal action. Additionally, potential health and safety effects that could disproportionately affect children are considered under the guidelines established by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, acts as additional protection for migratory birds.

1.5 RESOURCES NOT CARRIED FORWARD FOR DETAILED ANALYSIS

The determination of issues to be analyzed versus those not carried forward for detailed analysis is part of the NEPA process as described in 40 CFR 1501.7(a)(3), which states that issues addressed in prior environmental reviews, or that are not potentially significant, may be eliminated from discussion in the EA. The Proposed Duke Low Airspace Action would not include supersonic flight activities, release of chaff and flares, or ordnance deployment. The Proposed Action would not include any infrastructure changes, construction, demolition, renovations, or ground-disturbing activities. In addition, several components of the Proposed Action limit environmental effects. The following is a list of each of the resources as prescribed by FAA Order 1050.1F, which have not been carried forward in this EA and the reason for excluding it from detailed analysis.

Air Quality. All counties beneath the proposed Duke Low MOA (Cameron, Clinton, Elk, McKean, Potter, Tioga, Allegany, and Cattaraugus) are in full attainment for all criteria pollutants (U.S. Environmental Protection Agency [USEPA] 2018). Because all areas associated with the Proposed Action are in attainment, the General Conformity Rules do not apply and a Record of Non-Applicability to the General Conformity Rule is available in **Appendix C**. Although the general conformity rule would not apply, the Air Conformity Applicability Model was used to estimate the total direct and indirect emission from air operations within the proposed SUA, which have been compared to the Prevention of Significant Deterioration major source thresholds to determine the level of effects under NEPA (**Table 1-1**) (United States Air Force [USAF] 2019a). Total emissions would be less than 10 percent of the *significance* indicator of 250 tons per year (tpy) of each pollutant and within an attainment area.

Table 1-1. Annual Air Emissions Compared to *De Minimis* Thresholds

	CO	NO_2	VOC	SO_2	PM_{10}	$PM_{2.5}$	Significance Indicator (tpy)	Exceeds Significance Indicator (Yes/No)
Aircraft Operations	6.0	4.2	1.1	0.5	1.7	0.7	250	No

Source: USAF 2019a. PM_{10} particulate matter 10 microns, $PM_{2.5}$ particulate matter 2.5 microns, SO_2 sulfur dioxide, NO_2 nitrogen dioxide, VOC volatile organic compound, CO carbon monoxide

The general conformity rule was established with NEPA in mind, and it is understood that actions of this size within a USEPA-designated attainment area would have negligible effects to air quality. Emission estimates in **Table 1-1** include all air operations in the proposed Duke Low MOA (i.e., 100 ft AGL to 8,000 ft MSL). Emissions from aircraft operations above the mixing height of 3,000 ft AGL are known not to have effects to individuals on the ground and are not normally included in an applicability analysis under the general conformity rule (40 CFR 93.153(c)(xxii)). However, this assessment conservatively includes these emissions, as well as all emissions within the proposed Duke Low MOA as a reasonable upper bound of effects. Actual emissions would be lower than those shown herein.

There would be no changes in personnel, no construction, and no changes in ground-based operations or training due to the Proposed Action. The Proposed Action would not include any new stationary sources of air emissions, and no air permits would be required. These effects would be negligible; therefore, air quality was not carried forward for detailed analysis in this EA.

Climate. Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. Both natural processes and human activities generate these emissions. Each GHG is assigned a global warming potential, which is the ability to trap heat, and is standardized to carbon dioxide (CO_2), which has a global warming potential value of one. A GHG is multiplied by its global warming potential to calculate the total equivalent emissions of carbon dioxide (CO_2e). The accumulation of GHGs in the atmosphere regulates the earth's temperature. Observations show that warming of the climate is unequivocal. The global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases. These emissions come mainly from the burning of fossil fuels (coal, oil, and gas), with contributions from forest clearing, agricultural practices, and other activities. To minimize GHG impacts, Federal agencies and installations are required to comply with Federal climate change policies.

The Air Force, in keeping with the mandate of EO 13834, *Efficient Federal Programs*, operates with the following goals to reduce energy consumption and as a result reduce GHG emissions:

- Achieve and maintain annual reductions in building energy use and implement energy efficiency measures that reduce costs.
- Meet statutory requirements relating to the consumption of renewable energy and electricity.
- Ensure that new construction and major renovations conform to applicable building energy efficiency requirements and sustainable design principles and annually assess and report on building conformance to sustainability metrics.
- Track and report on energy management activities, performance improvements, cost reductions, greenhouse gas emissions, energy and water savings, and other appropriate performance measures.

At this time, climate change presents a global problem caused by increasing concentrations of GHG emissions. While climate change results from the incremental addition of GHG emissions

from millions of individual sources, the significance of an individual source alone is impossible to assess on a global scale beyond the overall need for global GHG emission reductions to avoid catastrophic global outcomes.

The Proposed Action would have negligible effects on climate. There would be no changes in personnel, no construction, and no changes in ground-based operations or training due to the Proposed Action. The Proposed Action would not include any new stationary sources of air emissions. Any increase in greenhouse gas emission from aircraft operations in the proposed airspace would be directly offset by reductions in emissions from the required training where it would otherwise be conducted. Climate would remain consistent with existing conditions. These effects would be negligible; therefore, climate was not carried forward for detailed analysis in this EA.

Coastal Resources. The proposed modifications to the Duke MOA would not affect coastal resources because the MOA is located well inland. According to 16 U.S.C. §1453, Definitions (Section 304) regarding Great Lakes waters, the coastal zone extends inland from the shorelines only to the extent necessary to control shorelands, the uses of which have a direct and significant impact on the coastal waters, and to control those geographical areas which are likely to be affected by or vulnerable to sea level rise. The Duke Low MOA is not located in the coastal zone. Therefore, coastal resources and Coastal Zone Management Act consistency were not carried forward for detailed analysis in this EA

Department of Transportation Act: Section 4(f). Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the program or project includes all possible planning to minimize harm resulting from the use. Section 4(f) applies only to agencies within the U.S. Department of Transportation. The proposal would not require the use or modification of any publicly owned land. Per FAA Order 1050.1F, SUA actions are exempt from the requirements of Section 4(f) and, therefore, this resource was eliminated from further consideration. (FAA 2020).

Farmlands. Farmlands are defined in the FAA 1050.1F Desk Reference as those agricultural areas considered important and protected by federal, state, and local regulations (FAA 2020). The Farmland Protection Policy Act regulates federal actions with the potential to convert farmland to non-agricultural uses. The National Land Cover Database shows 9 percent of the land beneath the Duke Low MOA is designated as crops and pastureland. The Proposed Action would have negligible effects to farmlands. There would be no short- or long-term changes in land use due to the Proposed Action. Additionally, the Proposed Action would not involve any ground disturbance

or conversion to non-agricultural uses. There would be no changes in personnel, no construction, and no changes in ground-based operations or training due to the Proposed Action. Proposed activities would not alter the current land use classifications, nor would they occur on farmlands. All land use would remain unchanged when compared to existing conditions. The effects would be negligible; therefore, the analysis of farmlands was not carried forward for detailed analysis in this EA.

Hazardous Materials and Wastes. No ground disturbing activities (e.g., construction or demolition) would occur as a part of the Proposed Action. Consequently, there would be no increase in the temporary storage of construction-related materials and wastes. No changes to the existing mission would occur under the Proposed Action. Therefore, no impacts associated with hazardous materials and wastes are anticipated. Military aircraft operating within the proposed airspace would continue to adhere to DAF fuel dumping procedures, when necessary (i.e., in life-threatening emergency situations). Fuel dumping is not a component of any routine flight training and only occurs during in-flight emergency circumstances with a loss of life potential for the pilot (FAA Order JO 7110.65Z Section 4 Fuel Dumping). Fuel dump procedures would remain unchanged under the Proposed Action and fuel venting (discharge of raw fuel in exhaust during flight operations) is highly unlikely to occur within the airspace. These effects would be negligible; therefore, hazardous materials and wastes were not carried forward for detailed analysis in this EA.

Natural Resources and Energy Supply. The Proposed Action would not involve extractive activities or changes in the energy supply; therefore, natural resources and energy supply was not carried forward for detailed analysis in this EA.

Visual Effects. The Proposed Action would have negligible effects on visual features. There would be no construction or infrastructure development associated with the Proposed Action, and no changes to the visual or aesthetic characteristics of any area. Aircraft would not create condensation trails within the proposed Duke Low MOA, as the aircraft would not operate above 25,000 ft AGL, the minimum altitude normally required to produce them. Under the Proposed Action, low level flights of military aircraft would be observed, similar to those currently observed under existing conditions, but at lower altitudes. However, given the short window of proposed operations, these sightings would not result in significant impacts. The Proposed Action would not produce light emissions that create annoyance or interfere with activities or contrast with, or detract from, the visual resources and/or the visual character of the existing environment. These effects would be negligible; therefore, visual effects was not carried forward for detailed analysis in this EA.

Water Resources. No construction activities or other ground-based activities would occur under the Proposed Action, and its implementation would not cause any disturbance of surface water or groundwater resources, including wetlands, floodplains, surface waters, groundwater, or wild and

scenic rivers. The proposed low-altitude training would not impact any water resources. Therefore, water resources was not carried forward for detailed analysis in this EA.

1.6 RESOURCES CARRIED FORWARD FOR DETAILED ANALYSIS

In accordance with NEPA, the CEQ regulations, 32 CFR 989 and FAA Order 1050.1F, the description of the affected environment focuses on those resource areas potentially subject to impacts and should be commensurate with the anticipated level of environmental impact. After preliminary analyses of resources as prescribed by FAA Order 1050.1F and other NGB requirements, the following resource areas will be carried forward for further analysis in the EA due to the potential for direct, indirect, or cumulative effects:

Airspace Management. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with Airspace Management are in **Section 3.1** of the EA.

Noise. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with noise are in **Section 3.2** of the EA.

Land Use. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with land uses are in **Section 3.3** of the EA.

Biological Resources. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with biological resources are in **Section 3.4** of the EA.

Cultural Resources. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with cultural resources are in **Section 3.5** of the EA.

Human Health and Safety. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with human health and safety are in **Section 3.6** of the EA.

Socioeconomics. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with population and income, recreation and rural economies and their relationship to wildlife, tourism and open spaces are in **Section 3.7** of the EA.

Environmental Justice. Detailed descriptions of the affected environment and analysis of the environmental consequences associated with low-income, minority, and youth populations are in **Section 3.8** of the EA.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter presents a detailed description of the Proposed Action, including the requirement to provide an integrated, year-round, realistic training environment in accordance with A-10C RAP and AFMAN 11-2A-10Cv1 training requirements. The details of the Proposed Action form the basis for the analyses of potential environmental effects presented in **Chapter 3** of the EA. This chapter includes a discussion of alternatives considered but dismissed from further analysis, as well as the No Action Alternative. No viable alternatives to the Proposed Action were identified.

2.1 SELECTION CRITERIA

The current airspace limitations of the Duke MOA do not allow for low-altitude training. To allow for the required training events, the proposed airspace must be of sufficient, contiguous size and altitude to train and prepare military aircrews for current and future conflicts in a realistic training environment. The criteria for selection of alternatives are summarized below.

- Must be within 200 nautical miles [NM]) of Martin State Airport, as flying long distances to remote or out-of-state airspace and returning to the home base in Maryland would substantially limit valuable training time and increase fuel consumption and costs. The aircraft need to fly to the training airspace, conduct the specified training, and return to base with adequate fuel reserves for safety;
- Must provide sufficient low-level airspace to accommodate A-10C pilot training requirements; and
- Must be adequate for 175 WG low level flight operations to maintain proficiency.

Without airspace that meets these selection criteria, the 175 WG would be severely constrained while trying to achieve their required training goals. The inability to establish low-level airspace of suitable dimensions would result in training shortfalls and negatively impact both combat readiness and pilot safety.

2.2 PROPOSED ACTION

The proposed Duke Low MOA, covering 1,727 SNM, would be in Pennsylvania and New York (**Figure 2-1**). The proposed Duke Low MOA would modify the existing altitudes of the existing Duke MOA to allow for low-altitude training. The low altitude MOA would follow the lateral footprint of the existing Duke MOA, except for the southwestern portion, to avoid potential operational impacts to regional airports. To further clarify the components of the Proposed Action, the NGB and the 175 WG prepared proposed mitigation measures to address concerns raised by PA DCNR while ensuring the Maryland ANG A-10 training mission. The components of the Proposed Action include:

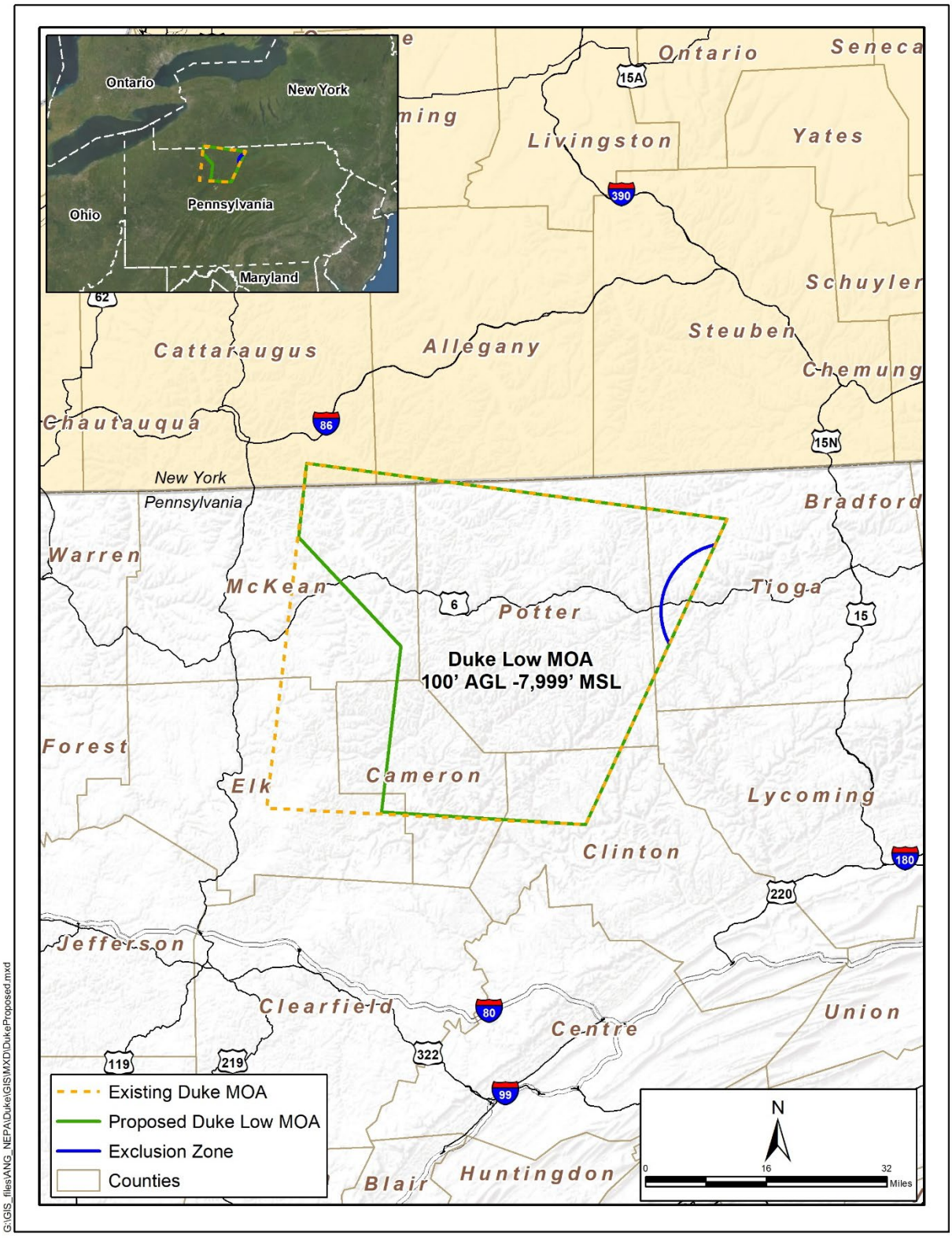
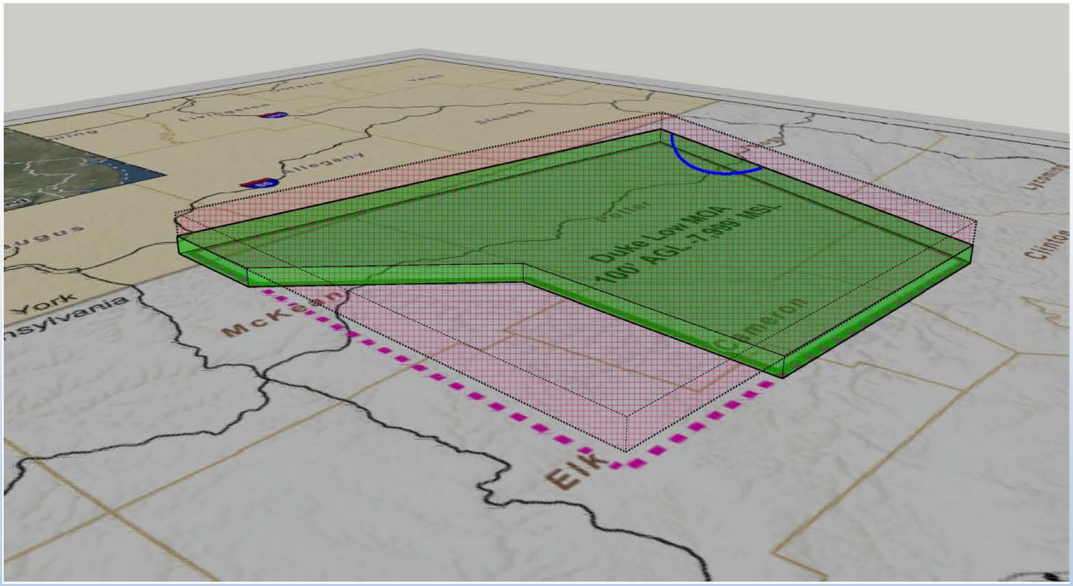


Figure 2-1. Proposed Duke Low MOA

1. The vertical limits would be defined as 100 ft AGL to 7,999 ft MSL.
2. The Duke Low MOA may be activated separately from the Duke MOA or concurrently, as needed, to facilitate low-level training requirements.
3. Activation times would be intermittent by Notice to Air Missions (NOTAM).
4. Expected usage would be two hours per day, twice per day, one hour at a time, with no more than six total aircraft on the days of activation, approximately 170 days per year.
5. Weekend operations would be limited mostly to Saturdays; Sundays would be non-typical.
6. The Maryland ANG is a federal entity that would not typically, outside of wartime, fly on federal holidays.
7. Nighttime operations (defined as sunset until 10:00 p.m.) at low altitude (below 500 ft AGL) would be limited to above 1,000 ft AGL.
8. A surface to 6,000 ft MSL exclusion area would avoid Wellsboro Airport Class E airspace within the eastern side of the Duke Low MOA. No supersonic operations, release of chaff and flares, ordnance deployment, weapons firing, infrastructure changes or ground disturbance would be conducted in the Duke Low MOA.
9. A 1,000 ft AGL floor would be implemented over sensitive areas of concern in the southern portions of the Duke Low MOA, specifically over the Hammersley Wild Area, Forrest H. Dutlinger Natural Area and the Kettle Creek State Park.
10. A 1,000 ft overflight buffer and a 0.5 NM lateral buffer around Bald and Golden Eagle nests would be incorporated per Air Force direction.
11. A 500 ft AGL floor would be implemented over sensitive areas of concern in the remaining portions of the Duke Low MOA, such as over the State Parks, Sinnemahoning Creek and the historical Austin Dam ruins.
12. A 500 ft overflight buffer would be maintained over obstacles such as radio towers, windmills and oil drilling rigs per AFMAN 11-202v3, *Flight Operations*.

Figure 2-2 depicts the Duke Low MOA beneath the existing Duke MOA. The airport exclusion zone (in blue) and southwestern portion to avoid regional airports are shown.



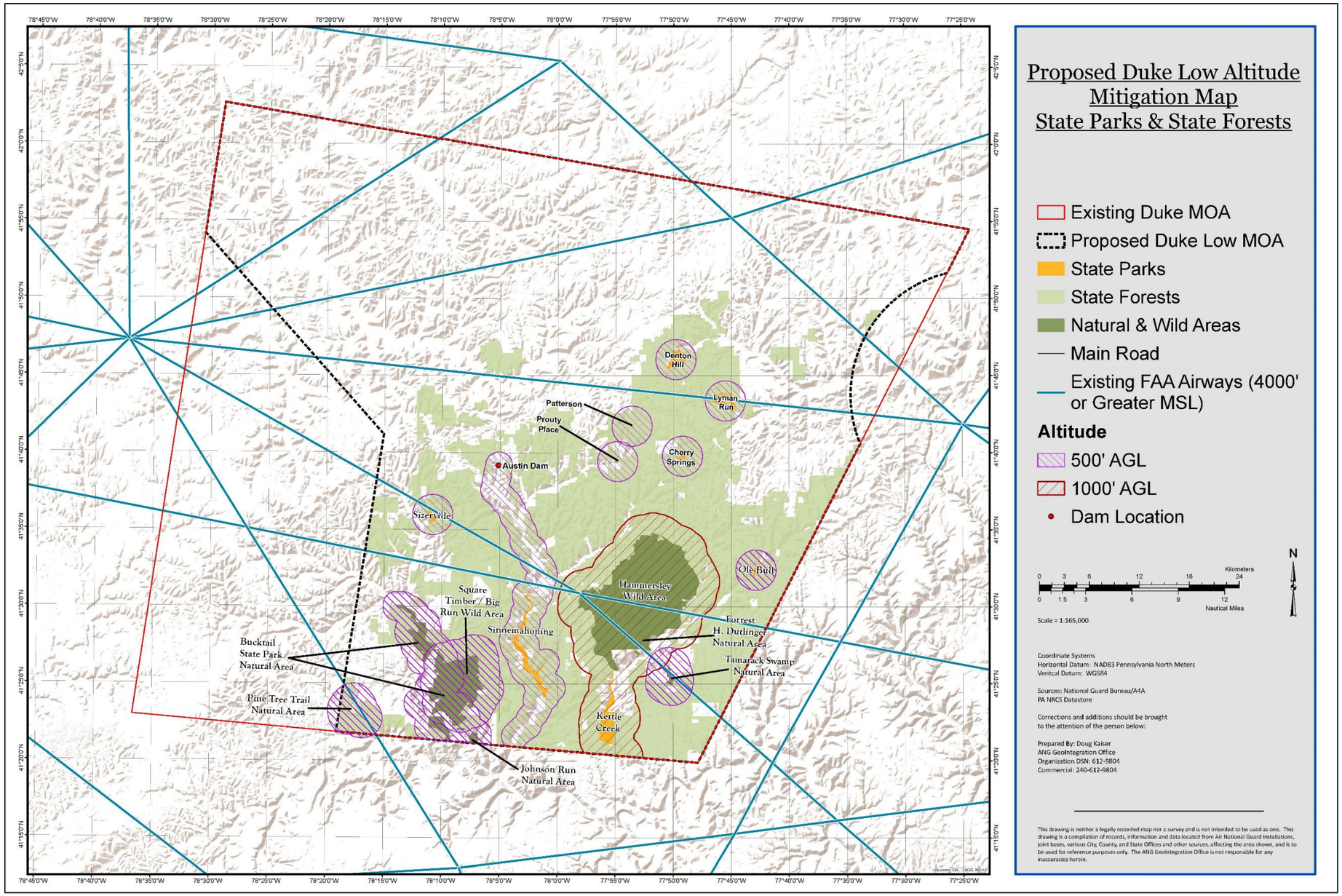
The Duke Low MOA, depicted in 3-D beneath the existing Duke MOA, at 100 ft AGL to 7,999 ft MSL.

Figure 2-2. Proposed Duke Low MOA Beneath the existing Duke MOA

Published activation timeframes and actual usage time are different terms. On the days that the proposed Duke Low MOA would be activated, it would normally be used in the following timeframe: one hour in the morning between the hours of 10:00 a.m. – 12:00 p.m. and one hour in the afternoon between the hours of 2:00 p.m. and 4:00 p.m. During the one hour of usage time for each sortie, the majority of flight time would be spent at higher altitudes (above 1,000 ft). The A-10 aircraft would spend approximately ten minutes or less below 1,000 ft. Overall, during each sortie, aircraft would be down in the low altitude ranges between 500 ft to 100 ft for 2-3 minutes per activation. The LASDT training down to 100 ft AGL would be only several seconds and less than 0.5 miles overland in the 2-3 minutes of flight in the low altitude ranges. The aircraft's radar altimeter is used to measure AGL altitude. In forested areas where the tree canopy is approaching 100 ft in height, the aircraft would be at least 100 ft above the tree canopy or 200 ft AGL over the areas. In addition, 95 percent of aircraft operations would be conducted above 1,000 ft AGL.

The Bird/Wildlife Air Strike Hazard (BASH) prevention program parameters, as required by DAF and FAA pre-flight protocols, would continue to be implemented. It is a standard operating procedure for flying units to have direct communication with other agencies who would be operating within proximity of ANG aircraft operations. The ANG Eastern Area Defense Sector would coordinate with the Pennsylvania Game Commission (PGC) to establish a communications plan with protocols, to allow for de-confliction of the airspace as needed during activities, such as annual species population surveys.

The proposed Duke Low MOA altitudinal mitigation map for state parks and state forests is presented in **Figure 2-3**. The proposed altitudinal mitigation map was prepared by NGB and 175 WG based on concerns raised by PA DCNR and other state agencies. This was offered as mitigation due to the recreational use of the area within Kettle Creek State Park and Hammersley Wild Area. The other areas identified are utilized as wild areas. Low altitude avoidance and noise sensitive areas for the proposed airspace would be identified in the local flight instructions for pilots. Pilots would be instructed to avoid these locations by horizontal (1 NM lateral boundary) and vertical distances (500 and 1,000 ft AGL) to enhance flight safety, noise abatement, and environmental sensitivity.



Source: NGB/A4AM

Figure 2-3. Duke Low MOA Altitudinal Mitigation Map for State Parks and State Forests

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Potter County contains most of the proposed Duke Low MOA and is representative of the landscape beneath the airspace. This region of the Appalachian Plateau is deeply dissected, having extensive areas of steeply sloping land separated by narrow ridges and valleys (Denny 1956). There is very little level land. Uplands rise to altitudes of more than 2,500 ft MSL and the maximum relief across the county is more than 1,500 ft but the local relief is generally 300 to 800 ft. **Figure 2-4** indicates that the proposed low airspace would rise and fall according to the surface elevation to remain at least 100 ft AGL.

Figure 2-4. View of Variable Terrain Beneath the Existing Duke MOA

The Proposed Action would be implemented in accordance with FAA Regulation 7400.2, Paragraph 21-3-3.f.2, which states that proposals to establish SUA with a floor below 1,200 ft AGL where there is underlying private or public use land, must include a statement that the proponent agrees to provide reasonable and timely aerial access to such land. The Proposed Action would be implemented under FAA Exemption 4371, which allows the DAF to conduct low-level operations no lower than 100 ft above obstacles when employing visual low-level procedures. A copy of FAA Exemption 4371 is discussed further in **Section 2.2.2**, Air Operations, and can be found in **Appendix D**. A cross-section of the proposed Duke Low MOA is depicted in **Figure 2-5**. Beneath the Duke Low MOA, a 1 NM lateral boundary was drawn around each of the areas shown in **Figure 2-3** where altitudinal restrictions would be implemented. The vertical diagram shows the proposed Duke Low MOA beneath the existing Duke MOA, except for the southwest corner avoidance area for St Mary's Municipal Airport. The existing Air Traffic Control Assigned Airspace (ATCAA) above 18,000 ft MSL, which is not utilized by the 175 WG, is also shown. The lateral coordinates of the proposed airspace are presented in **Appendix E**, Aeronautical Proposal.

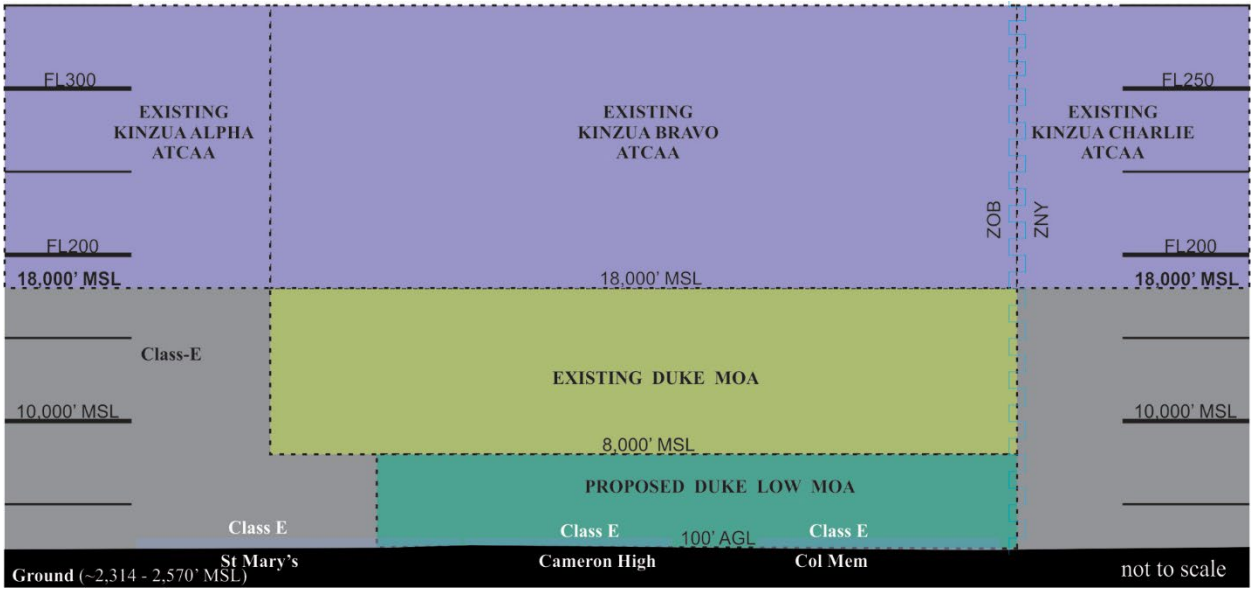


Figure 2-5. Cross-Section of Proposed Duke Low MOA

2.2.1 Aircraft Operations

The A-10C aircraft operations are defined in **Table 2-1** and the definitions are taken from the various aeronautical proposals prepared for MOAs. Each of these mission sets has a specific reason which requires the use of lower altitudes.

Table 2-1. Aircraft Operations Defined

Aircraft Operation	Definition
Offensive Counter Air – Attack Operations (OCA-AO)	Exercise designed to imitate air-to-ground weapons employment against adversary aircraft and integrated air defense systems.
Combat Search and Rescue (CSAR)	Operations that are carried out within or near combat zones by a task force of helicopters, ground-attack aircraft, aerial refueling tankers and an airborne command post.
Close Air Support (CAS)	Aircraft operations with strike capabilities in support of ground maneuver operations.
Forward Air Control (FAC)	Aircraft engaged in CAS of ground troops. The FAC is normally an airborne extension of the tactical air control party.
Air Interdiction (AI)	Aircraft operations to effect visual or electronic contact by a friendly aircraft with another aircraft.
Surface Attack (SAT)	A SAT mission designed to imitate the delivery of munitions to a ground target.

2.2.1.1 Other Expected Users

In addition to the 175 WG as the primary user, other expected users of the Duke Low MOA would include the 177 FW (New Jersey ANG), 193d Special Operations Wing (Pennsylvania ANG), and the 113 WG (District of Columbia ANG). The 177 FW and 113 WG operate F-16Cs. The 193d

Special Operations Wing operates C-130s. The ANG Eastern Area Defense Sector, which manages and maintains all ANG-owned airspace in the Northeastern U.S., is the using agency of the Duke MOA.

2.2.2 Air Operations

The projected aircraft utilization within the existing and proposed airspace is presented in **Table 2-2**. The projected percent time in each altitude block for each aircraft type is presented in **Table 2-3**. Operations conducted at 100 ft AGL would be one percent of the overall aircraft utilization. In addition, 95 percent of aircraft operations would be conducted above 1,000 ft AGL. The LASDT operations would be to momentarily (several seconds) lower to 100 ft AGL, return to 300 ft AGL, and then return to 500 ft AGL. In a given hour of usage, A-10C aircraft would spend approximately ten minutes or less below 1,000 ft AGL. Overall, during each sortie, aircraft would be down in the low altitude ranges between 500 ft to 100 ft AGL for 2-3 minutes per activation. The LASDT training down to 100 ft AGL would be only several seconds and less than 0.5 miles overland in the 2-3 minutes of flight in the low altitude ranges. Pilots review the routes before low altitude flights occur to ensure safety and obstacle avoidance. CSAR training is the primary driver for low altitude airspace need. The existing Duke MOA is authorized for evening operations (sunset to 10:00 p.m.), including lights out nighttime flying with night-vision goggles as authorized by the FAA (Exemption No. 7960I).

14 CFR 91 governs general operating and flight rules for all civil, generally non-commercial aircraft. It governs situations where the pilot is directly responsible for private aircraft. Since the Proposed Action would be implemented for the operation of military aircraft at lower altitudes, 14 CFR 91 would not apply. FAA Exemption 4371 was granted to DAF on 21 June 1985, which allows the DAF to "conduct low-level operations without complying with enroute minimum altitudes for flight under IFR or direction of flight requirements for IFR enroute segments in uncontrolled airspace." The exemption is reviewed every two years to ensure that it is justified, and conditions and limitations are adjusted, if necessary. The exemption was extended on 16 March 2022 through 31 July 2024. As such, flying is allowed at altitudes no lower than 100 ft above obstacles when employing visual low-level procedures. Operations under this exemption must be conducted under the procedural requirements of a letter of agreement between the 175 WG and the FAA Cleveland Air Route Traffic Control Center (ARTCC). The FAA exemption to fly below 500 ft AGL within SUAs is an operational feasibility exemption and does not address potential environmental effects.

Table 2-2. Existing and Proposed Air Operations

	Annual Usage				Individual Mission Parameters	
Aircraft	Number of Missions	Time in Airspace (hours)	Single Aircraft Sorties	Percent Busiest Month	Average Aircraft Per Mission	Average Time Per Sortie (minutes)
Existing Duke MOA						
A-10C	100	65	200	25%	2	39
F-16C*	200	100	400	15%	2	30
F-16C**	15	10	30	15%	2	38
C-130J	50	59	50	15%	1	71
Duke MOA and Proposed Duke Low MOA						
A-10C	300	300	600	25%	2	60
F-16C*	150	111	300	15%	2	44
F-16C**	15	10	30	15%	2	38
C-130J	63	74	63	15%	1	71

*** 177WG ** 113WG. Note: Percent Busiest Month = Percentage of the total annual operations that are conducted in the busiest month of the year. The remaining operations would be distributed throughout the year.**

Table 2-3. Projected Percent Time in Each Altitude Block for Each Aircraft Type

	Percent Time in Each Altitude Block		
Altitude Block (AGL)	A-10C	F-16C	C-130J
100'-500'	1%	0%	0%
500'-1000'	4%	5%	5%
1,000'-2,500'	20%	10%	10%
2,500-7,000'	50%	10%	30%
Above 7,000'	25%	75%	55%

Note: Elevations under the Duke MOA range from approximately 1,000 ft to 2,000 ft MSL, and 6,000 ft AGL is approximately 8,000 ft to 9,000 ft MSL representative of the lower portions of the existing Duke MOA.

2.3 ALTERNATIVES DISMISSED FROM FURTHER ANALYSIS

Figure 2-6 depicts the airspace within 200 NM of the Martin State Airport. The existing airspaces were considered in the analysis of alternatives to accomplish the purpose and need for the action.

Modification of the Evers MOA in West Virginia was considered as an alternative but dismissed from further analysis. The primary consideration for eliminating use of the Evers MOA was that the existing MOA (1,000 ft AGL floor) or the proposed modifications (1,000 ft AGL floor) by other users would not support A-10C low-level qualifications training below 500 ft AGL and would not be adequate for 175 WG low-level flight operations to maintain proficiency. Evers MOA cannot be expanded below 1,000 ft AGL due to mountainous terrain and the resulting sparse radio coverage. In addition, the national radio quiet zone is beneath the Evers MOA.

Creation of a new stand-alone MOA within 200 miles of Martin State Airport that would allow full spectrum training was considered as an alternative but dismissed from further analysis. No area was identified that would impose minimum impact on nonparticipating aircraft and ATC operations because of the congested airspace in the northeast region. According to FAA Regulation

7400.2, 21−1−7, *Optimum Use of Airspace*, SUA should be located to avoid airways/jet routes, major terminal areas, and known high volume Visual Flight Rules (VFR) routes.

Patuxent River Restricted Areas. R- 4005, -4006, -4007, -4008, and -6609 have limitation on use by non-Navy based aircraft. ATC Centers – Washington Center and Cleveland Center, were consulted on utilizing the Restricted Areas for the proposed Action and withheld approval. The Restricted Areas are generally not viable options for accomplishing the purpose and need for the Proposed Action due to the small size of the ranges and the limited mission sets allowable. R-4006 is 20 NM east of the Naval Air Station Patuxent River and 60 NM southeast of Martin State Airport. Airspace altitudes are 3,500 ft to 40,000 ft MSL. The U.S. Navy controls R-4006 airspace. It has been the primary airspace used by the 175 WG for CAS, CSAR, SAT, AI, and other training missions. R-4006 is used by multiple airframes for training and is a high demand airspace for multiple squadrons and services. In recent years, the U.S. Navy has decreased the amount of time an outside user is allowed to schedule R-4006, thus severely limiting the 175 WG's ability to conduct required real world training missions. In 2015 and 2016, the 175 WG flew approximately 25 percent of all training sorties in R-4006. In 2017, that number decreased to two percent because of low availability for scheduling. Consequently, the potential for establishing low-level airspace in R-4006 is negligible. R-4006 is no longer a reliable airspace that the 175 WG can utilize to conduct required A-10C pilot training.

Alert Area 220 does not exclude VFR and IFR aircraft; however, there are safety concerns for using this airspace because the McGuire AFB – Lakehurst airspace is within a high air traffic route for military and civilian scheduling in the east coast region of the U.S. Redirecting air traffic to/from Philadelphia International Airport, Joint Base McGuire-Dix-Lakehurst, and numerous other civilian airfields would cause severe disruptions to an already busy region. The airspace does not meet the needs of the 175 WG training requirements.

Restricted Area R-4001 A/B/C at the Aberdeen Proving Grounds is not large enough to accommodate the 175 WG training requirements and excludes tactical approach and departure activities. There are safety concerns because of low altitude ingress and egress training requirements. The airspace cannot be modified because of proximity to Baltimore/Washington International Airport.

Warning Areas are airspaces over water and the CAS training required in the Proposed Action must be conducted over land that provides for tactical training opportunities such as using points of interest, terrain masking, and low altitude navigation. In addition, the airspaces do not provide opportunities for ground support communication and there are no ground targets for simulation training.

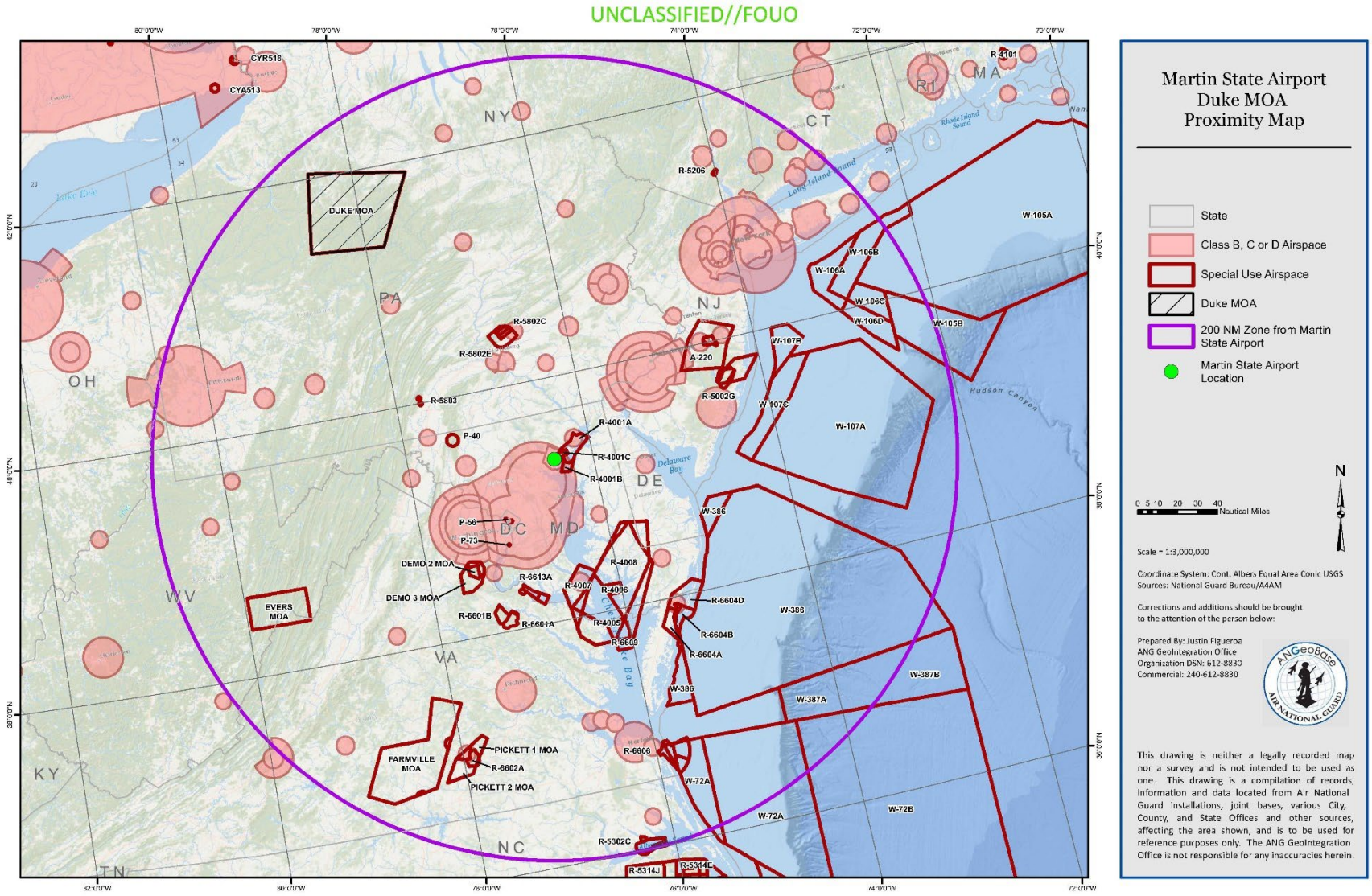


Figure 2-6. Airspace within 200 NM of the Martin State Airport

Restricted Area R-5002 (Warren Grove Range, NJ) and R-5802 (Ft Indiantown Gap, PA) are currently used by all four military services for various air and ground training exercises. R-5002 is approximately 100 NM northeast of Martin State Airport. R-5802 is approximately 70 NM north of Martin State Airport. R-5002 is not available when a range control officer is not present and is not a viable option for additional training. In addition, R-5002 and R-5802 are not large enough to adequately facilitate all the training requirements for the primary users.

Farmville and Pickett MOAs are designed primarily of use by army helicopters. There are 5,000 ft altitude weather restrictions for using the MOAs and expansion of the MOAs cannot be accommodated to support the requirements of the Proposed Action. Any potential modification of the Farmville and Pickett MOAs would significantly interfere with existing civilian air traffic operations.

MTRs. The 175 WG uses regional MTRs to accomplish portions of the low-level training requirements. MTRs provide excellent low-level airspace below 1,500ft AGL; however, MTRs are single-direction routes that do not allow for full, random combat maneuvering.

2.4 NO ACTION ALTERNATIVE

The CEQ regulation 40 CFR 1502.14(c) and 32 CFR 989.8(a) specifically require analysis of the "No Action" alternative in all NEPA documents. Under the No Action Alternative, the proposed Duke Low MOA would not be implemented, and the existing Duke MOA would remain in use. No changes in flight altitudes would be implemented. Current operations in the existing Duke MOA would continue under the No-Action Alternative. Under the No Action Alternative, the 175 WG would continue to experience training shortfalls that negatively impact combat readiness and pilot safety. Although the No Action Alternative would not meet the purpose of and need for the Proposed Action, it will serve as a baseline to compare potential environmental impacts of the Proposed Action.

2.5 SUMMARY

Table 2-4 presents a summary of the alternatives compared to the selection criteria. Only the Proposed Action meets all the selection criteria and it, along with the No Action Alternative, have been carried forward for detailed analysis in this EA.

Table 2-4. Summary of Alternatives

Selection Criteria	Proposed Duke Low MOA	Modification of Evers MOA	New Stand-Alone MOA	Patuxent River/ R-4006, Aberdeen Proving Grounds RAs	RAs, Warning Areas, Alert Areas, and MTRs	Farmville/ Pickett MOAs	No Action
Within 200 NM of Martin State Airport	Yes	Yes	No	Yes	Yes	Yes	No
Accommodate A-10C pilot training requirements	Yes	No	No	No	No	No	No
Adequate for 175 WG low-level proficiency	Yes	No	No	No	No	No	No
Meets All Selection Criteria	Yes	No	No	No	No	No	No

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes relevant and existing environmental conditions for resources potentially affected by the Proposed Action. In compliance with NEPA, CEQ regulations, FAA Order 1050.1F, and 32 CFR 989, the assessment focuses only on resource areas subject to potential environmental effects. The affected environment and assessment of environmental consequences focuses on the modification of the existing Duke MOA altitudes to establish the Duke Low MOA, allowing for low altitude training. A brief discussion of resource areas with negligible environmental effects anticipated from implementation of the Proposed Action is presented in **Section 1.5**, *Resources Not Carried Forward for Detailed Analysis*.

3.1 AIRSPACE MANAGEMENT

3.1.1 Definition of Resource

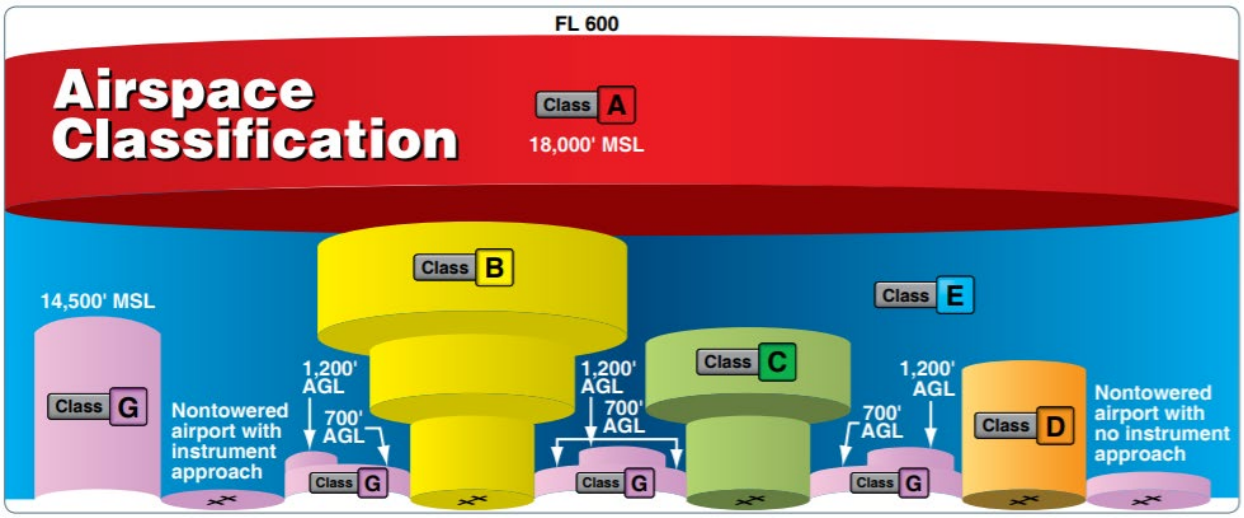
Airspace consists of both controlled and uncontrolled areas. Controlled airspace and the constructs that manage it are known as the NAS. This system is "…a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures; technical information; and manpower and material" (FAA 2015b). Navigable airspace is airspace above the minimum altitudes of flight prescribed by Title 49, Subtitle VII, Part A, Air Commerce and Safety, and includes airspace needed to ensure the safety of aircraft launch, recovery, and transit of the NAS (49 U.S.C. 40102).

Congress has charged the FAA with the responsibility of developing plans and policies for the use of navigable airspace and assigning, by regulation or order, the use of the airspace necessary to ensure efficient use and the safety of aircraft (49 U.S.C. 40103(b)). The FAA also regulates military operations in the NAS through the implementation of FAA Order JO 7400.2N, and FAA Order JO 7610.4W, *Special Operations*. FAA Order JO 7610.4W was jointly developed by the DoD and the FAA to establish policy, criteria, and specific procedures for ATC planning, coordination, and services during defense activities and special military operations. The use and management of airspace by the DAF is defined in Department of Air Force Manual (DAFMAN) 13-201 *Airspace Management* and Air Force Instruction (AFI) 11-214 *Air Operations Rules and Procedures.* Different classifications of airspace are defined by different types of altitude measurements. The classifications commonly referred to throughout this section are:

- AGL - The distance above ground level.
- MSL - The altitude above mean sea level as defined by altimeter instrumentation.
- Flight Level (FL) - Altitudes expressed in hundreds of feet.

IFR and VFR are the two basic modes of flying. IFR is a method of air navigation that relies on instrumentation, and which is always under the direction of ATC. As aircraft launch at one airport, traverse the sky, and then land at a different airport, every movement is directed by the ATC. Control is transferred from one ATC to another as aircraft cross jurisdictional lines as designated by the FAA. VFR is a method of air navigation that relies primarily on visual reference for location and see-and-avoid techniques for safe separation of aircraft. VFR flying is subject to weather conditions.

Controlled airspace is a limited section of airspace where ATC is provided to IFR and VFR traffic. Controlled airspace classifications include Classes A through E and Class-G (there is no Class-F) (**Figure 3-1**).



Source: Pilot's Handbook of Aeronautical Knowledge, Chapter 15 (FAA 2019)

Figure 3-1. Airspace Classification Diagram

- Class-A airspace is the region between above 17,999 ft MSL and FL600 over the contiguous U.S. All traffic in this airspace follows IFR. The airspace is dominated by commercial traffic using designated flight routes between 18,000 ft MSL and FL450.
- Class-B airspace is typically associated with larger airports to manage large numbers of sorties and types of aircraft. It is typically configured in multiple layers resembling an upside-down layer cake. The first layer (inner circle) is typically from surface to 10,000 ft MSL and 10 to 20 NM in diameter. The next circle typically extends from 1,200 ft AGL to 10,000 ft MSL and 30 NM in diameter. The outer circle lies outside of the second and may extend from 2,500 ft AGL to 10,000 ft MSL and 40 NM in diameter.
- Class-C airspace is the most common class for airports with control towers, radar approach control, and a certain number of IFR operations. While each Class-C airspace is specifically tailored to the needs of the airport, a typical configuration consists of an inner circle of 5

NM extending from surface to 4,000 ft MSL, and an outer circle of 10 NM extending from 1,200 ft AGL to 4,000 ft MSL.

- Class-D airspace extends upward from the surface to 2,500 ft above the airport elevation surrounding airports with operational control towers. Each Class-D airspace area is individually tailored, and instrument procedures for their use are published.
- Class-E airspace is any controlled airspace that is not Class A, B, C, or D. It extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Class-E transitional airspace is also used by transiting aircraft during take-off and landing from 700 ft AGL up to 17,999 ft MSL. Federal airways are Class-E airspace, as well as offshore airspace areas below 18,000 ft MSL.
- Class-G airspace that is not Class A, B, C, D, or E is Class-G (uncontrolled airspace) and is not subject to restrictions that apply to controlled airspace. Limits of uncontrolled airspace typically extend from the surface to 1,200 ft AGL below Class-E airspace. Uncontrolled airspace can extend above these altitudes to as high as 14,500 ft MSL if no other types of controlled airspace have been assigned. ATC does not exercise control over aircraft within Class-G airspace. Primary users are general aviation aircraft operating with VFR.

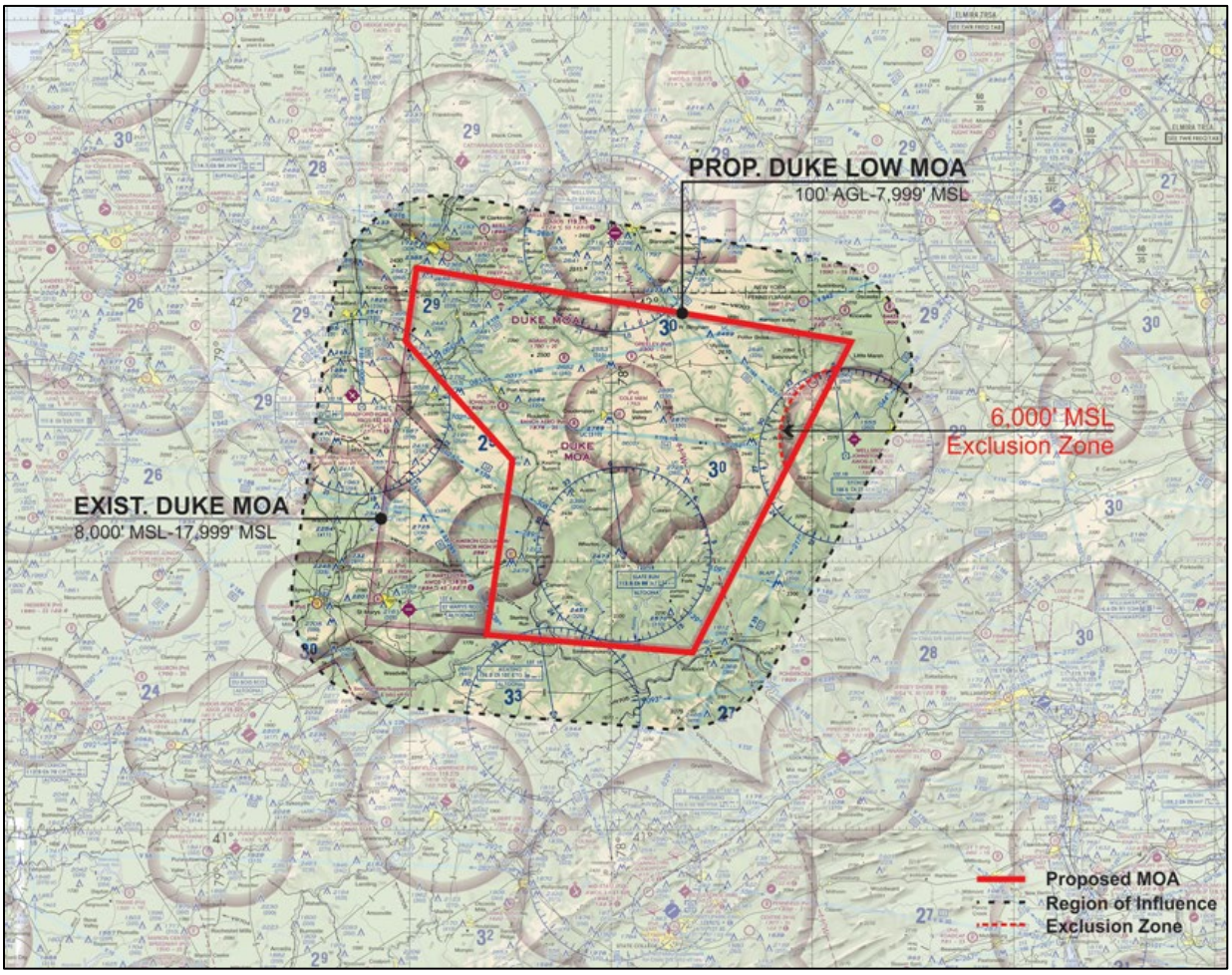
Civilian aircraft operating under IFR are allowed to fly through active MOAs under certain conditions. ATC may clear IFR traffic through an active MOA, if minimum IFR separation distances can be provided by ATC and procedures are described in a Letter of Agreement between the military unit and the ATC controlling agency (FAA Order JO 7400.2). If separation distances cannot be maintained, ATC will reroute or restrict IFR traffic from entering the active MOA.

Civilian aircraft may also operate under VFR in an active MOA while using see-and-avoid flight procedures to avoid military training activities. These aircraft are operated using outside visual references for navigation, weather avoidance, traffic separation, and obstruction clearances. VFR aircraft are not under positive control by ATC, nor are they required to establish two-way communication with ATC. Because aircraft under VFR are not required to be in constant communication with ATC, private pilots should exercise increased vigilance, or request ATC flight-following service, due to unusual or dangerous activity that might be occurring. ATC flight following services are provided to requesting pilots on an ATC workload permitting basis. Flight following services will assist VFR aircraft flying through the MOA by identifying potential conflicting traffic to the pilot.

All MOAs and Restricted Areas are depicted on sectional charts identifying the exact area, the name of the airspace, altitudes of use, published hours of use, and the controlling agency. ATCAAs are uncharted airspace above 17,999 ft MSL that accommodate high-altitude military flight training. ATC routes IFR traffic around ATCAAs when activated.

3.1.2 Affected Environment

The ROI for the airspace analysis includes parts of the following Pennsylvania counties: Elk, Cameron, Clinton, McKean, Potter, and Tioga. In addition, a small fraction of the northwest corner of the Duke MOA overlies portions of Cattaraugus and Allegany counties in New York. The ROI is an area extending 10 NM outside the Duke MOA (**Figure 3-2**).



Source: Sky Vector Flight Planning/Aeronautical Charts (https://skyvector.com/) and Duke Aeronautical Proposal

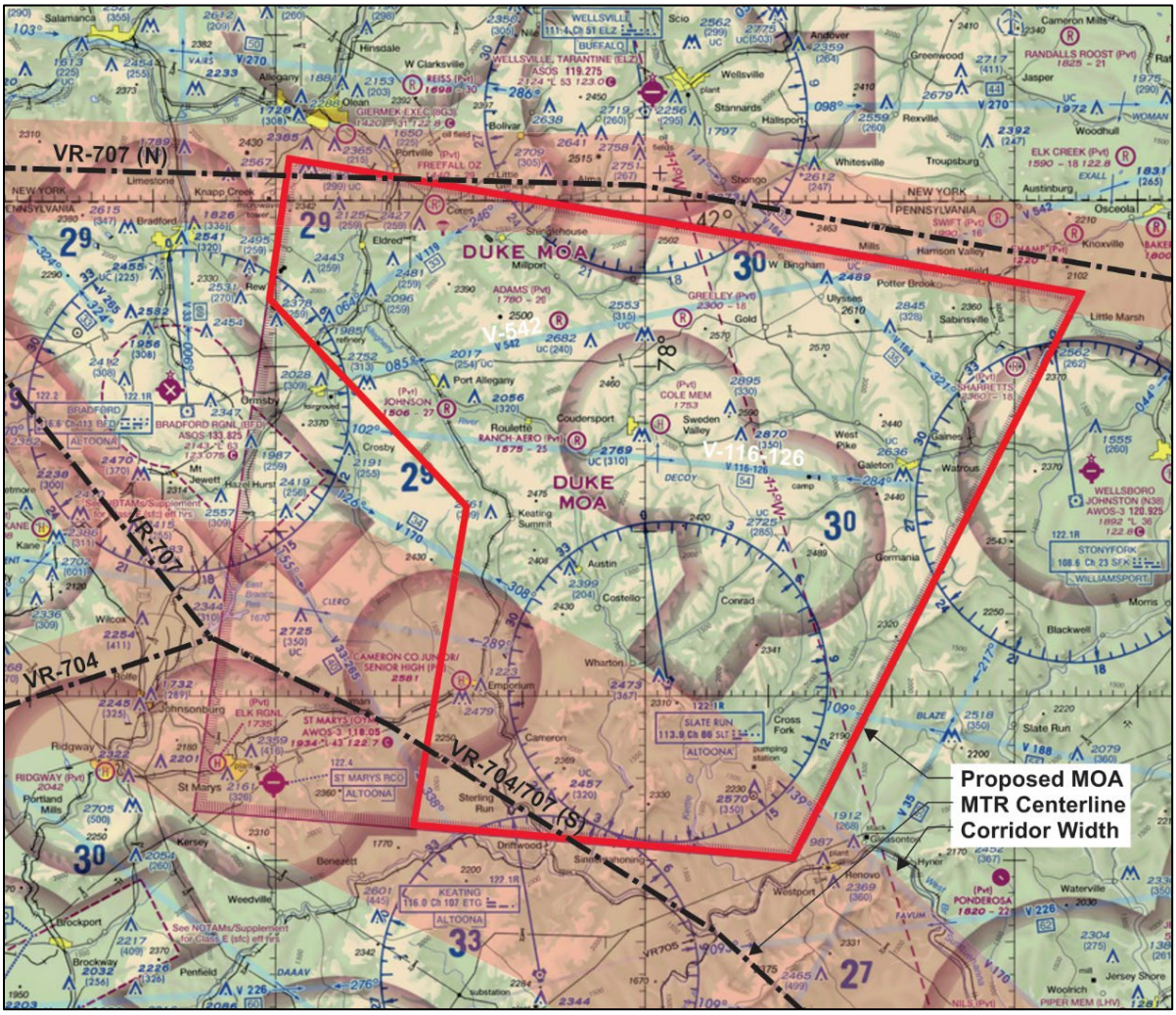
Figure 3-2. ROI for Duke MOA

3.1.2.1 Military Operations Area

The existing Duke MOA extends from 7,999 ft AGL up to 17,999 ft MSL. The airspace charted activation times are intermittent and other times by NOTAM. It encompasses an area of 2,178 SNM, mostly over northern Pennsylvania with a small triangular wedge extending into southern New York State. It lies entirely within and is controlled by the Cleveland ARTCC. The eastern boundary of the MOA runs along the jurisdictional line between Cleveland Center (ZOB) and New York Center. The primary user is the 175 WG (104 FS) of the Maryland ANG.

3.1.2.2 Military Training Routes

There are several established MTRs used by the military for low-level training (**Figure 3-3**). MTRs also provide access to and from ranges and between installations in the area. MTRs include visual routes (VR), instrument routes (IR), and slow routes. Each route is identified by two letters, followed by either four numbers for routes below 1,500 ft AGL, or three numbers for those above 1,500 ft AGL. IR routes are flown under ATC, while VRs are not. The MTRs within the ROI, VR-707-N and VR-707-S, intersect a small portion of the proposed Duke Low MOA. In the area beneath both the existing Duke MOA and the proposed Duke Low MOA, VR-707 and VR-704 are contiguous, sharing a common centerline and route width. **Table 3-1** identifies the characteristics and annual usage of the MTRs in the ROI.



Source: Sky Vector Flight Planning/Aeronautical Charts (https://skyvector.com/) and Duke Aeronautical Proposal

Figure 3-3. Military Traffic Routes in the ROI

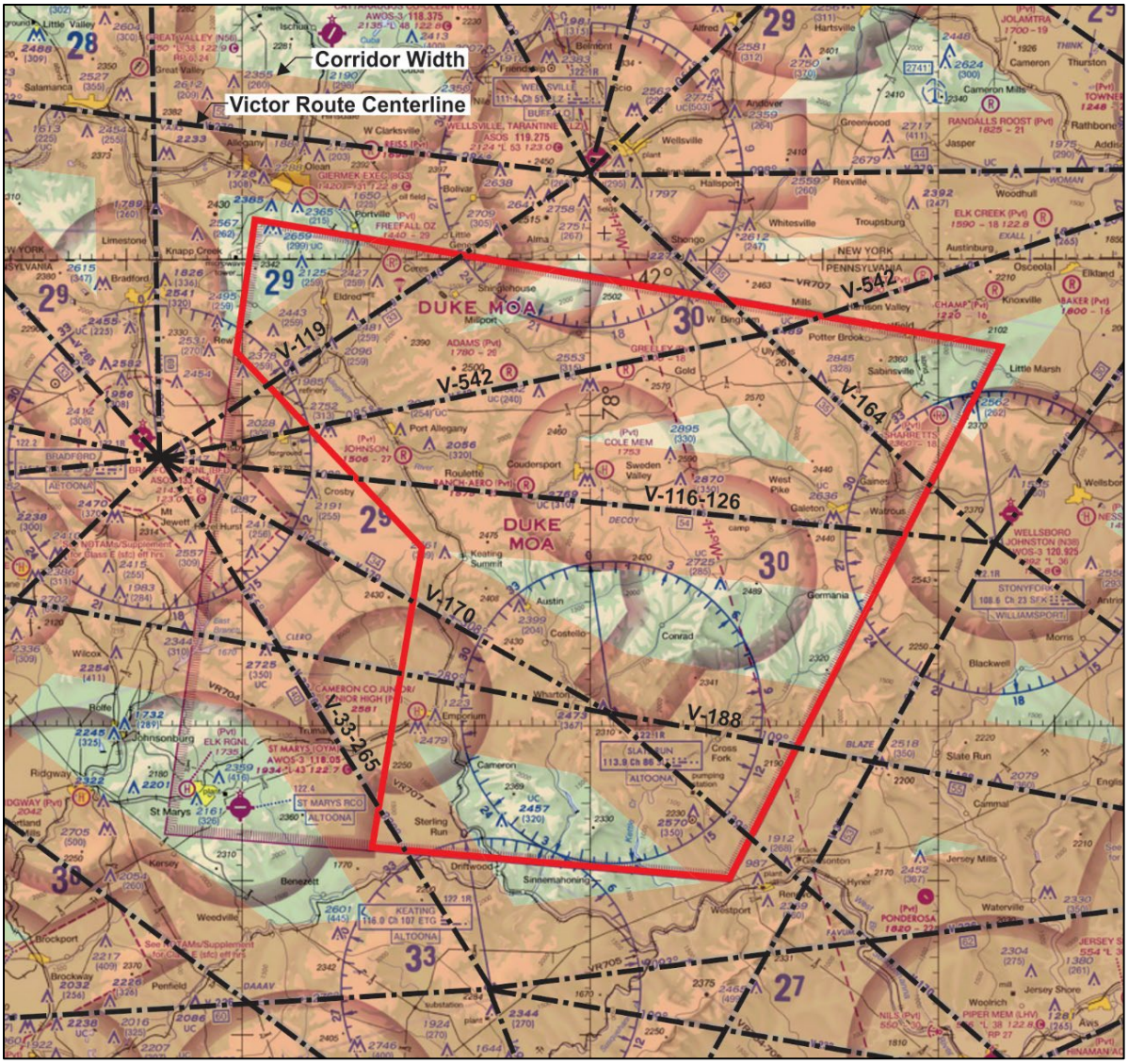
Table 3-1. Military Training Route Characteristics

Route	Width (NM)	Altitude	Usage (# sorties/yr)	Scheduling Agency
VR-704	6-20	100’ AGL - 11,000’ MSL	137	193 SOW/Det 1
VR-707-N	6	500’ MSL - 5,000’ MSL	38	193 SOW/Det 1
VR-707-S	6- 20	100’ AGL - 11,000’ MSL	38	193 SOW/Det 1

Source: DoD 2022

3.1.2.3 Federal Air Corridors

Federal airways are linear routes that extend between navigational beacons which broadcast directional information allowing aircraft to maintain course along a route (**Figure 3-4**). Federal



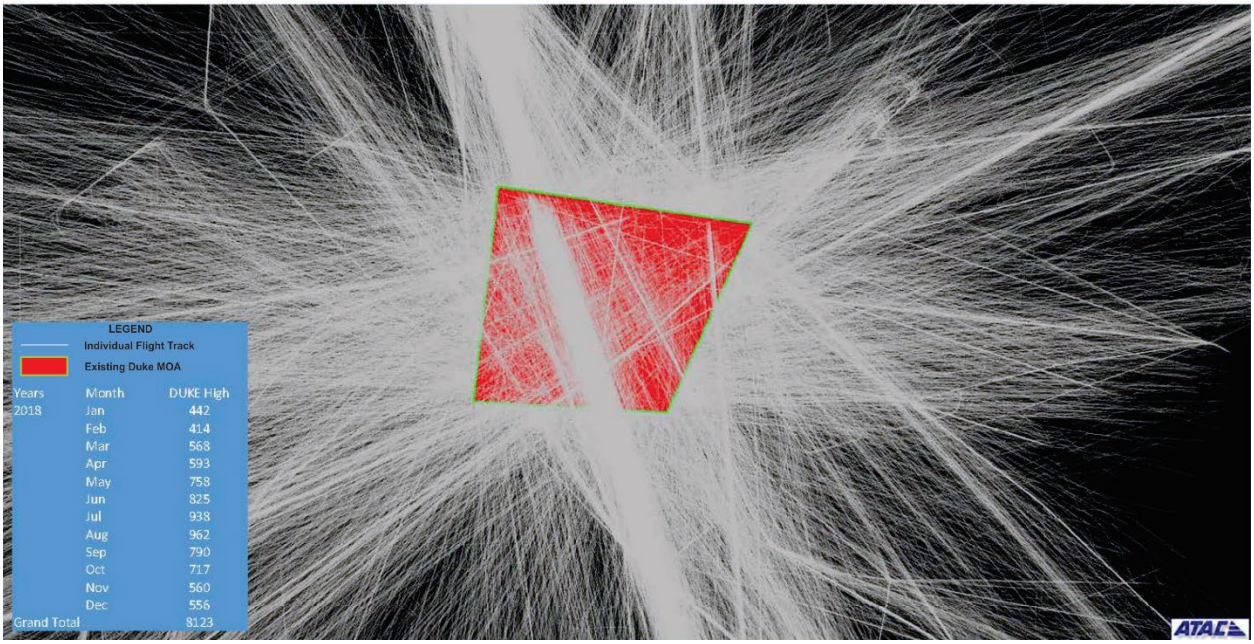
Source: Sky Vector Flight Planning/Aeronautical Charts (https://skyvector.com/) and Duke Aeronautical Proposal

Figure 3-4. Victor Airways in the ROI

airways include low-altitude victor airways and high-altitude jet routes. Victor airways extend from 1,200 ft AGL to 18,000 ft MSL in Class-E airspace. There are seven Victor airways that traverse the ROI. High-altitude commercial "J" routes and "Q" routes extend from FL180 to FL450 and provide a more systematic flow of high-altitude air traffic. There are several commercial J-Routes and Q–Routes in the high IFR airspace that traverse the ROI. All the high-altitude routes are above the existing Duke MOA.

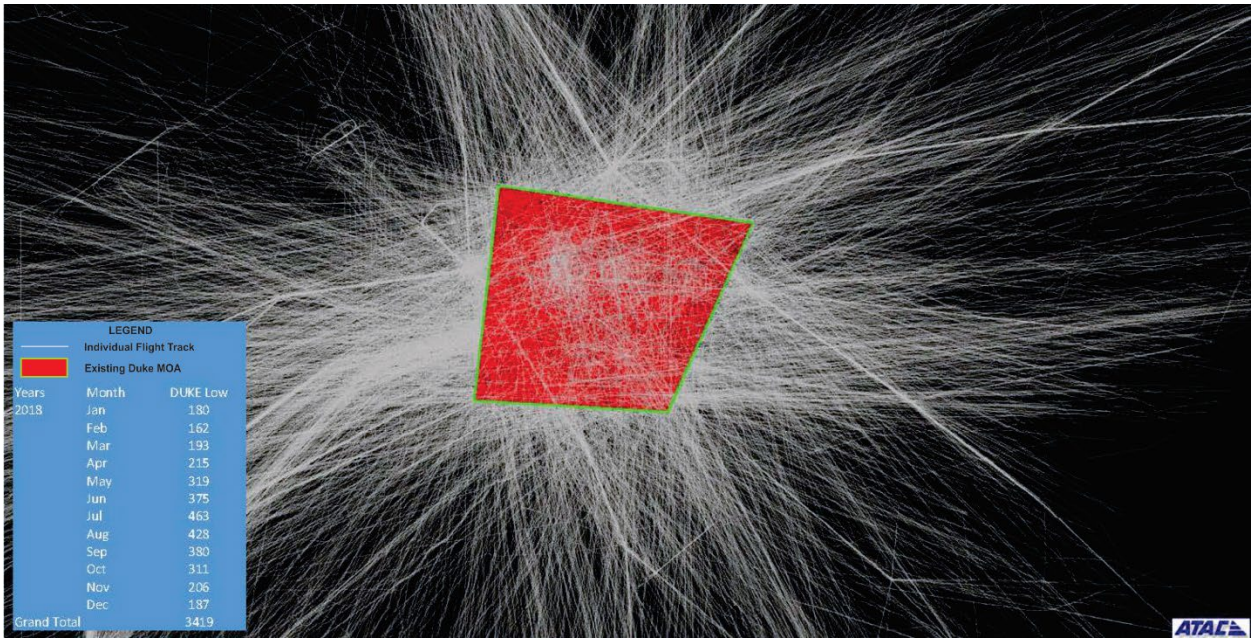
3.1.2.4 Existing Aircraft

Aircraft in the region are tracked in the Performance Data and Reporting System (PDARS). This data includes Victor airways flights, military air operations, and all aircraft with active transponders. **Figure 3-5** shows the flight tracks for aircraft that flew through the Duke MOA in 2018, and **Figure 3-6** shows the flight tracks for aircraft that flew through the proposed Duke Low MOA in 2018. Due to changes in air traffic from the COVID-19 pandemic, the 2018 data was chosen as the most reflective of what future operations would be as opposed to using later operations numbers. **Table 3-2** outlines the total number of aircraft that flew through the Duke MOA and the proposed Duke Low MOA in 2018. In 2018, 8,123 aircraft flew through the Duke MOA, and 3,419 flew through the proposed Duke Low MOA airspace.



Source: FAA Aviation Simulation and Analysis Air traffic Operations (https://www.atac.com/).

Figure 3-5. Existing Flight Tracks (8,000-18,000 ft MSL) – Duke MOA



Source: FAA Aviation Simulation and Analysis Air traffic Operations (https://www.atac.com/).

Figure 3-6. Existing Flight Tracks (100 ft AGL-7,999 ft MSL) – Proposed Duke Low MOA

Table 3-2. Annual Aircraft in the Airspace

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total
Proposed Duke Low MOA	180	162	193	215	319	375	463	428	380	311	206	187	**3,419**
Duke MOA	442	414	568	593	758	825	938	962	790	717	560	556	**8,123**

Notes: Duke MOA is 8,000 ft MSL – 17,999 ft MSL. Proposed Duke Low MOA is Surface to 7,999 ft MSL.
Source: PDARs provided by FAA ATAC

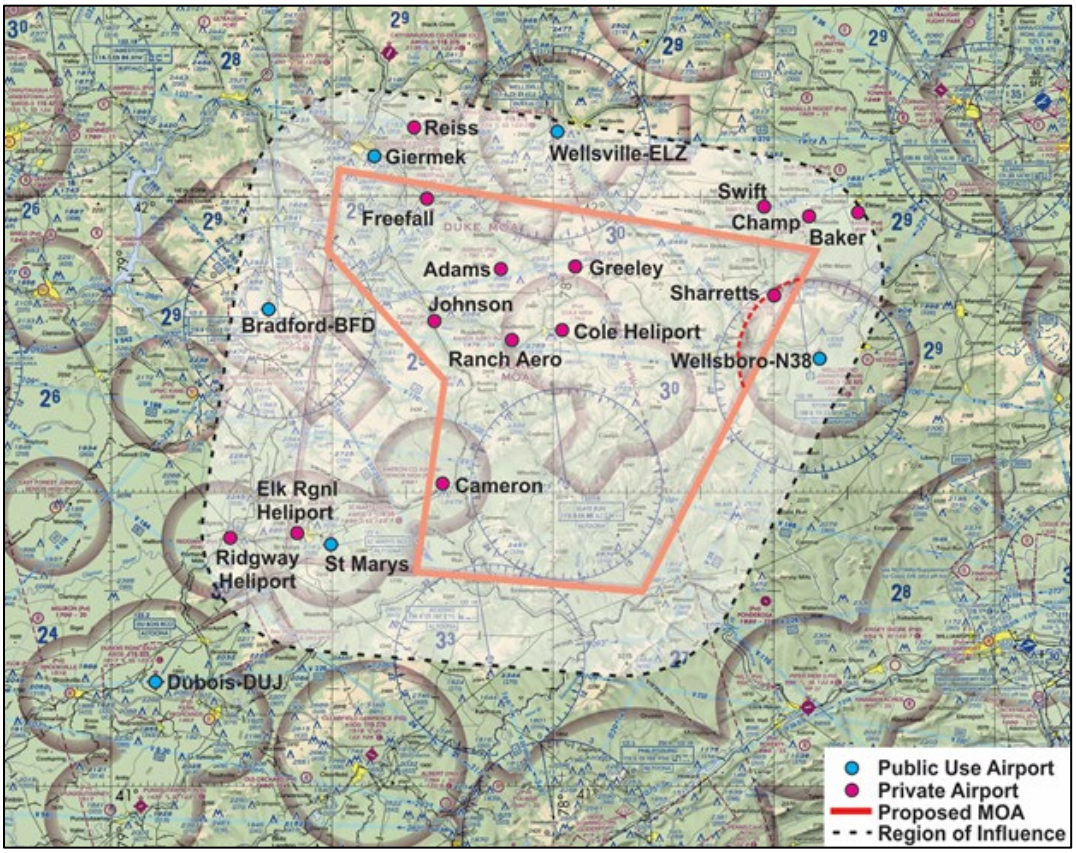
3.1.2.5 Airfields

Table 3-3 and **Figure 3-7** provide information on civilian airfields located within the ROI. There are three public and eight private airports within the ROI. There is an Area Navigation (RNAV) instrument approach for the Wellsboro Johnston Airport that extends into the proposed exclusion zone on the eastern boundary of the proposed Duke Low MOA. Aircraft using the airports under the proposed Duke Low MOA would arrive and depart essentially unimpeded. Pilots could fly under VFR through MOA airspace when it is activated. Some revectoring may be required during periods when the Duke Low MOA is activated.

Table 3-3. Civilian Airfields in the ROI

Airport Name	ID	Status (Public/ Private)	IFR or VFR
Beneath Proposed MOA			
Adams Airport	90PA	Private	VFR
Cameron County High School Heliport	8PN7	Private	VFR
Charles Cole Memorial Hospital Heliport	PN09	Private	VFR
Freefall OZ Airport	06PA	Private	VFR
Greeley Airport	PN15	Private	VFR
Johnson Airport	2PA5	Private	VFR
Ranch-Aero Airport	PN90	Private	VFR
Sharretts Airport	PN91	Private	VFR
Within ROI			
Baker Airport	PA75	Private	VFR
Bradford Regional Airport	KBFD	Public	IFR
Champ Field Airport	6PS3	Private	VFR
Elk Regional Medical Center Heliport	7PS9	Private	VFR
Giermek Executive Airport	8G3	Public	VFR
Nessmuk Heliport	25PN	Private	VFR
Reiss Game Farm Airport	75NY	Private	VFR
Ridgeway Heliport	PN89	Private	VFR
St Marys Municipal Airport	KOYM	Public	IFR
Swift Aero Field Airport	2PN1	Private	VFR
Wellsboro Johnston Airport	N38	Public	IFR
Wellsville Municipal Airport	KELZ	Public	IFR

Source: AirNav.com



Source: Sky Vector Flight Planning/Aeronautical Charts (https://skyvector.com/) and Duke Aeronautical Proposal

Figure 3-7. Sectional Showing Airports Within the ROI

3.1.3 Significance Criteria

Effects to airspace use and management would not be considered significant unless the Proposed Action would (1) result in a violation of FAA (FAA Order 7400.2N Chg 1) or DAF criteria (DAFMAN 13-201); (2) undermine the safety of military, commercial or civil aviation; or (3) cause conflicts, congestion, or delays for a substantial number of non-participating aircraft. CEQ regulation (40 CFR 1508.27) direct that significance criteria are to be used as a guide, as significance must take into consideration the context and intensity of the Proposed Action. The airspace significance criteria present the context and intensity relative to regulations and guidance, safety, and general aviation use of airspace.

3.1.4 Environmental Consequences of the Proposed Action

The Proposed Action would not result in significant effects to airspace use and management. The Proposed Action would result in minor effects in the form of conflicts, congestion, or delays to non-participating aircraft. The Proposed Action would not (1) result in a violation of FAA or DAF criteria; (2) undermine the safety of military, commercial or civil aviation; or (3) cause conflicts, congestion, or delays for an appreciable number of non-participating aircraft.

3.1.4.1 Air Traffic

Table 3-4 outlines the number of non-military flights that could be affected by the Proposed Action. Approximately 7,300 non-military aircraft fly through the existing Duke MOA and 3,200 non-military aircraft fly through the airspace beneath the existing Duke MOA. The Proposed Action would affect approximately 950 VFR and 870 IFR civilian flights annually; 100 VFR and 270 IFR flights would be affected from the implementation of the proposed Duke Low MOA, and 850 VFR and 600 IFR flights would be affected from changes in activation of the existing Duke MOA. This would be 16 percent of the total flights through the existing Duke MOA and the proposed Duke Low MOA airspace. The flights that would typically fly through the proposed Duke Low MOA would either alter their flight path or modify their flight times slightly to avoid any conflicts during the activation of the airspace. While 16 percent of the total flights would be affected, delays would be considered minimal in accordance with FAA JO 7400.2.

Table 3-4. Flights Potentially Affected by Proposed Action

Function	Proposed Low MOA Airspace	Existing MOA Airspace	Total
Non-Military Traffic (aircraft per year)	3,200	7,300	10,500
Non-Military VFR Traffic (aircraft per year)	1,300	2,900	4,200
Non-Military IFR Traffic (aircraft per year)	1,900	4,400	6.300
VFR Flights Affected (aircraft per year)	100	850	950
IFR Flights Affected (aircraft per year)	270	600	870
Total Flights Affected (aircraft per year)	**370**	**1,450**	**1,820**

Sources: FAA 2018, AOPA 2019.

This assessment assumes (1) 5 percent of the aircraft would traverse both the high and low airspaces, all military aircraft would utilize both altitude blocks, (2) 40 percent of non-participating aircraft would be operating VFR (FAA 2018), (3) based on an Aircraft Owners and Pilots Association (AOPA) survey (AOPA 2019), 50 percent of pilots flying VFR would choose to avoid the Low MOA airspace based on charted activation times, and (4) 90 percent of non-participating aircraft would conduct operations between 9:00 a.m. and 10:00 p.m. (FAA 2018).

Because VFR aircraft are not required to maintain radio and radar contact with ATC at lower altitudes, the actual number of VFR aircraft potentially flying through the proposed SUA is unattainable. This EA approximates the percentage of VFR aircraft affected to be 50 percent based on a 2019 AOPA national survey which had limited responses. Although this survey provides good insight to how the respondents operate in the NAS, this survey is not directly related to the proposed airspace. This assessment was not designed to provide exact numbers, but to provide a rough-order-of-magnitude estimate of the number of aircraft potentially affected to determine the effects under NEPA.

As specified below in the management actions and special operating procedures, military training occurring within the proposed Duke Low MOA would maintain contact with the controlling agency (FAA, Cleveland ARTCC) to ensure proper separation with all non-participating aircraft, to include non-scheduled LIFE FLIGHT helicopters en route to UPMC Cole Hospital or other medical events. LIFE FLIGHT helicopters would not be impacted under the Proposed Action. The Duke Low MOA would only be activated and used when conditions allow pilots sufficient visibility to maintain visual separation from terrain and other aircraft. In addition, the Mid-Air Collision and Avoidance (MACA) educational and outreach program (SeeAndAvoid.org website) would continue to be utilized to ensure a comprehensive online flight-safety community.

Table 3-5 outlines some of the potential effects from establishing the Duke Low MOA on existing air traffic. Effects to individual flights would vary, ranging from minor inconveniences like additional flight planning, to moderate effects such as operating with an elevated risk of conflict with military training operations. Other effects to aircraft using these airports may include the need to operate with limited line-of-sight in mountainous terrain, and interference with radar and radio communication with ATC and other aircraft.

Table 3-5. Potential Effects to Aircraft and Airports

IFR Aircraft	VFR Aircraft	Airports
• Pilots may need additional flight planning to determine activation status of MOA. • Aircraft may need to reroute around or below MOAs when active. • Pilots may have potential conflict to flight plans while in transit due to unanticipated activations of MOA.	• Pilots may have potential conflict to flight plans while in transit due to unanticipated activations of MOA. • Pilots may have to operate with an elevated risk of conflict with military training operations – particularly at very low altitudes.	• The airports under this MOA are uncontrolled airfields. Pilots have no requirements for control tower operations.

The following management actions and special operating procedures would be implemented:

- Military aircraft training in the proposed Duke Low MOA would maintain contact with the controlling agency (FAA, Cleveland ARTCC) to ensure proper separation with all non-participating aircraft.
- The proposed Duke Low MOA would only be activated and used when visual meteorological conditions exist in the MOA as determined from the air, whereas VFR flight rules would always be adhered to in the Duke Low MOA. Pilots would always have sufficient visibility to maintain visual separation from terrain and other aircraft during approach and departure from the airports.
- Military safety officers would continue to utilize the MACA educational and outreach program to conduct public awareness and outreach. The SeeAndAvoid.org website helps all pilots safely share the skies. The site integrates and links with related sites such as FAA SUA, Aircraft Owners and Pilots Association's Air Safety Foundation, and others to create a comprehensive online flight-safety community.
- Upon request from the FAA or airports affected, written procedures could be established (per FAA JO 7400.2) to ensure proper IFR separation.

3.1.4.2 Airports

There are three public airports and eight private airports within 10 NM of the proposed Duke Low MOA. **Table 3-5** specifies that airports under the proposed Duke Low MOA are uncontrolled airfields with no requirements for control tower operations. Although aircraft can fly under VFR through MOAs when activated, additional coordination by the pilots using these airports may be necessary. Aircraft utilizing these airports would arrive and depart essentially unimpeded. Some revectoring as an IFR service provided by the appropriate ATC service may be required during periods when the existing Duke MOA and the proposed Duke Low MOA are active. On the days

that the proposed Duke Low MOA would be activated, it would normally be used for one hour in the morning between the hours of 10:00 a.m. – 12:00 p.m. and one hour in the afternoon between the hours of 2:00 p.m. and 4:00 p.m. The Proposed Action includes an exclusion zone for the Wellsboro Johnston Airport from surface to 6,000 ft MSL to allow for IFR traffic using the RNAV instrument approach for Runway 10. The proposed utilization would be approximately 495 hours per year spread throughout the airspace. These effects would not be considered significant.

3.1.5 No Action Alternative

The No Action Alternative would result in no change to the existing Duke MOA airspace use and management. Modification of the existing Duke MOA altitudes, establishing the proposed Duke Low MOA would not occur under the No Action Alternative. Airspace use and management would remain unchanged when compared to existing conditions. Existing management practices, as outlined above, would remain in place.

3.2 NOISE

3.2.1 Definition of Resource

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as aircraft operations, construction, or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighing", measured in dBA, approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their sound levels are provided in **Table 3-6**.

Table 3-6. Common Sounds and Their Levels

Outdoor	Sound Level (dBA)	Indoor
Jet flyover at 1,000 ft	100	Rock band
Gas lawnmower at 3 ft	90	Food blender at 3 ft
Downtown (large city)	80	Garbage disposal
Heavy traffic at 150 ft	70	Vacuum cleaner at 10 ft
Normal conversation	60	Normal speech at 3 feet
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room

Source: Harris 1998.

The sound pressure level noise metric describes steady noise levels, although few noises are, in fact, constant; therefore, additional noise metrics have been developed to describe noise including:

- Maximum Sound Level (L_{max}) – L_{max} is the maximum sound level of an acoustic event in dB (e.g. when an aircraft is directly overhead).
- Equivalent Sound Level (L_{eq}) - L_{eq} is the average sound level in dB
- Sound Exposure Level (SEL) – SEL is a measure of the total energy of an acoustic event. It represents the level of a one-second long constant sound that would generate the same energy as the actual time-varying noise event such as an aircraft overflight. SEL provides a measure of the net effect of a single acoustic event, but it does not directly represent the sound level at any given time.
- Day-night Sound Level (DNL) – DNL is the average sound energy in a 24-hour period with a penalty added to the nighttime levels. Because of the potential to be particularly intrusive, noise events occurring between 10:00 p.m. and 7:00 a.m. are assessed a 10 dB penalty when calculating DNL. DNL is a useful descriptor for aircraft noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. DNL provides a measure of the overall acoustical environment, but as with SEL, it does not directly represent the sound level at any given time.
- Onset-Adjusted Monthly DNL (L_{dnmr}) is the average sound energy in a 24-hour period with a 10 dB penalty added to the nighttime levels, and up-to an additional 11 dB penalty for acoustical events with onset rates greater than 15 dB per second, such as high-speed jets operating near the ground. L_{dnmr} is assessed for the month with the highest number of events, and as with DNL and SEL, it does not directly represent the sound level at any given time. Because of the penalties for rapid onset, L_{dnmr} is always equal to or greater than DNL.

3.2.2 Methodology

This noise analysis uses the MR_NMAP (v3.0) as part of the NoiseMAP computer suite to predict noise levels associated with aircraft operations beneath the proposed Duke Low MOA (DAF 2019). The parameters considered in the modeling included aircraft type, airspeed, power settings, aircraft operations, vertical training profiles, and the time spent within each airspace block. MR_NMAP is approved by FAA for subsonic military aircraft noise within specified airspace boundaries (FAA 2020).

Baseline data for the Duke MOA was collected during a site visit in February 2019. During the site visit, pilots with the 175 WG were interviewed and provided existing operations data and aircraft noise data profiles. Air operational data for the proposed MOA was provided by ANG operational personnel and checked for consistency with the traditional use of the existing airspace.

The primary users of the proposed Duke Low MOA would conduct exercises with A-10C, while the secondary users utilize F-16C, and C-130J aircraft. The Noise Study Report, available in **Appendix F** of this EA, contains the operational data used in MR_NMAP.

L_{dnmr} is the accepted noise metric for the DAF when determining noise levels from aircraft operations within SUA; however, average annual DNL is the accepted noise metric for the FAA when determining noise levels from aircraft operations within SUA. MR_NMAP was used to model the overall sound levels with both L_{dnmr} and DNL and both have been carried forward for use in this analysis to meet the requirements for both agencies. L_{dnmr} is based on average busiest month aircraft operations with rapid onset penalty, whereas DNL is based on annual air operations without rapid onset penalty. Due to the onset penalty and the use of busiest month operations, L_{dnmr} always equals or exceeds DNL.

As the action encompasses an area that is larger than the immediate vicinity of an airport and includes actions above 3,000 feet AGL, the noise analysis includes a discussion on a change-in exposure over sensitive receptors as well as population areas and examines the change in noise levels as compared to population and demographic information from the U.S. Census blocks. The assessment of (1) the population within areas exposed at or above DNL 65 dB, at or above DNL 60 but less than DNL 65 dB, and at or above DNL 45 dB but less than DNL 60 dB has been included in the discussion (FAA 2015a). In addition, change-of-exposure tables were developed to identify where noise would change by 1.5, 3, and 5 dBA (FAA 2015a). FAA Order 1050.1F defines the thresholds for "significant" noise impacts and the thresholds for "reportable" noise impacts. To assist the FAA in meeting its NEPA review, this EA includes data indicating locations/instances where increases of greater than 5 dBA DNL occur in areas where the dBA DNL is between 45 and 60 DNL. Data are also provided on instances where increases of greater than 3 dBA DNL would occur in areas where the current dBA DNL is between 60 dBA DNL and less than 65 dBA DNL. In addition, increases in noise levels by more than 1.5 dBA DNL in a noise sensitive area exposed to noise above 65 dBA DNL would be considered significant.

Supplemental Metrics. Both the DAF and the FAA encourage the inclusion of supplemental noise metrics in the assessment of noise from airspace actions. It is understood that the sole use of DNL and land-use compatibility cannot accurately describe the nature and effects from aircraft noise. This is particularly true for airspace actions which have effects of low- to medium- intensity over large geographical areas, as opposed to high-intensity effects over a smaller area (e.g., noise near an airport or air installation). MR_NMAP was also used to calculate L_{max} and SEL for individual overflights within the proposed Duke Low MOA. These metrics were used to assess the potential for disturbance to speech, to determine if individual acoustic events would be loud enough to damage hearing or structures, and to provide the public with a better understanding of the specific effects.

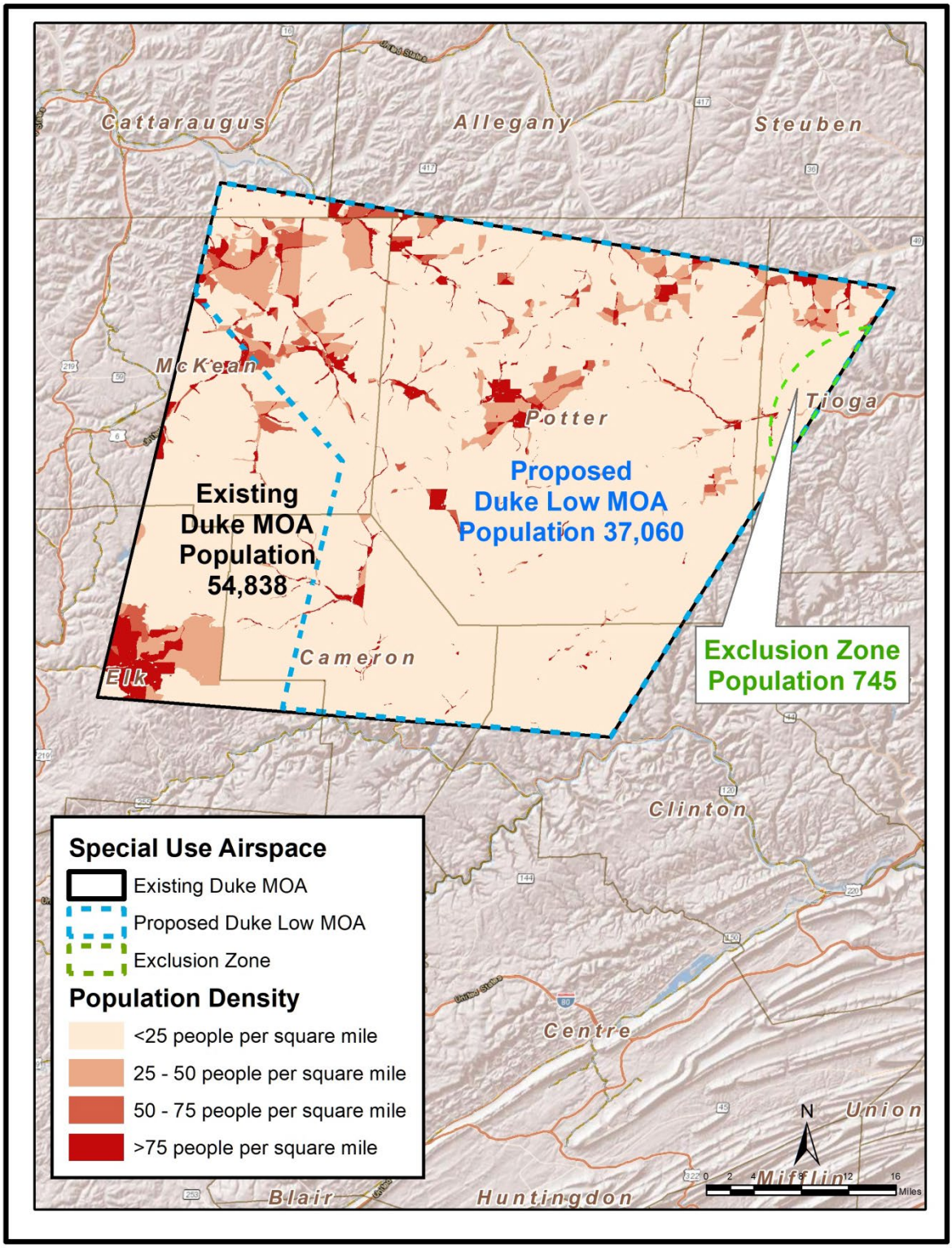
3.2.3 Population and Sensitive Land Uses

U.S. Census block data was used to determine the population exposed to aircraft noise. Other than visual counts, this is the narrowest available geo-referenced data set available. The existing Duke MOA is vast, covering 2,178 SNM, and the census block data was appropriate for this scale of activity. **Table 3-7** and **Figure 3-8** outline the population under the proposed Duke Low MOA. There are approximately 55,000 individuals and 35,000 households beneath the existing Duke MOA, approximately two-thirds of which reside beneath the proposed Duke Low MOA. In addition to individuals, there are 29,053 acres of state parks and 406,250 acres of state forests beneath the proposed Duke Low MOA. To further clarify the components of the Proposed Action, NGB coordinated with the 175 WG and PA DCNR to address the sensitive area concerns while ensuring the Maryland ANG A-10C training mission.

Table 3-7. Estimated Population Beneath the Proposed Duke SUA Complex

Airspace	Population	Households	Area (SNM)
Existing			
Duke MOA	54,838	34,892	2,178
Proposed			
Duke Low MOA	37,060	25,669	1,727

Source: U.S. Census Bureau 2018.



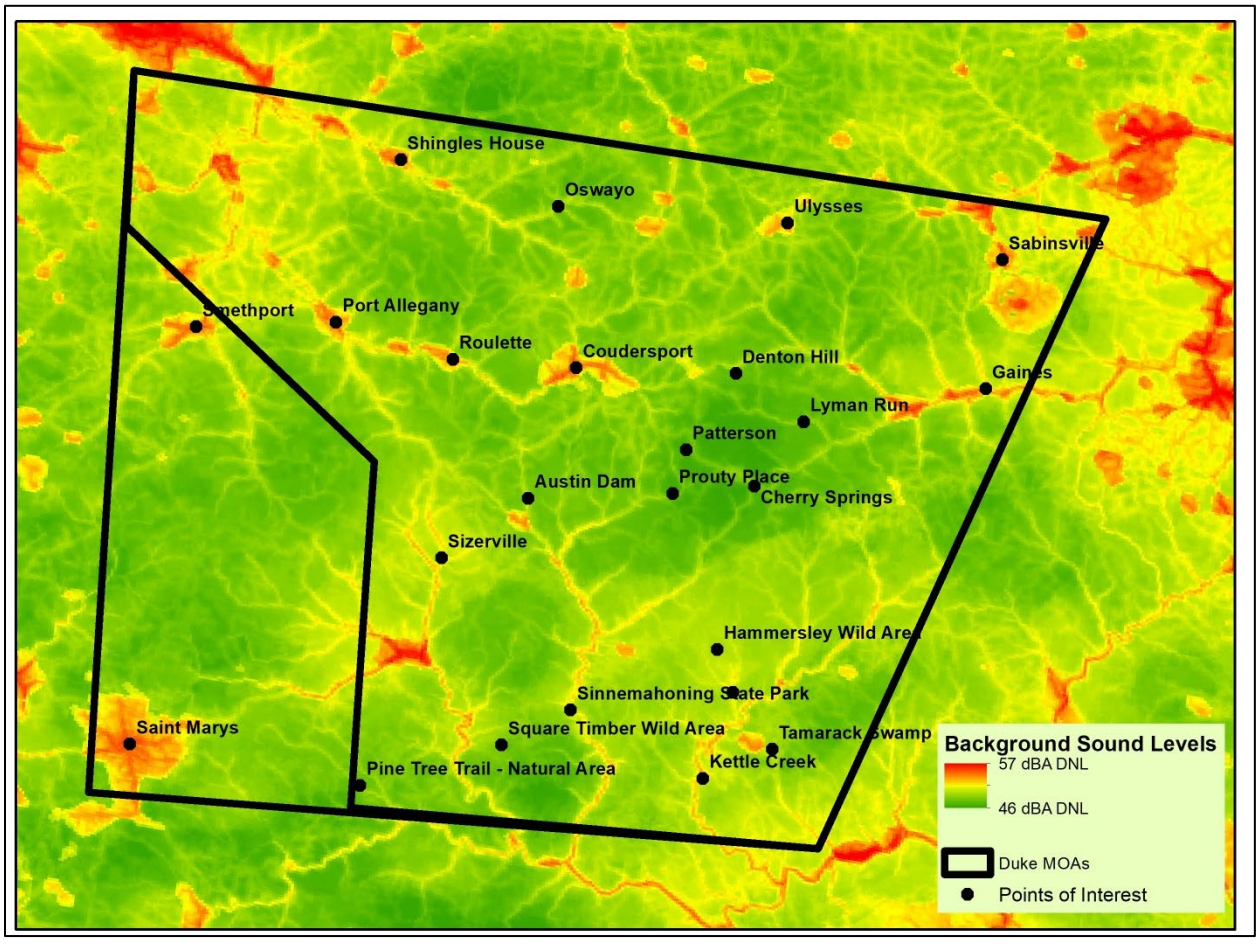
Source: U.S. Census 2018 and ESRI 2019.

Figure 3-8. Population Density

3.2.4 Affected Environment

3.2.4.1 Background Noise Levels

To provide context and a comparative baseline to gauge the intensity of the effects, a review of the background noise levels below the proposed Duke Low MOA was conducted. **Figure 3-9** shows background noise levels (DNL) without any aircraft activities and select points of interest below the Duke MOA. These points of interest were selected to represent the population centers and the range of recreational, wild and natural areas beneath the proposed Duke Low MOA. Background sound levels range from 46 to 57 dBA DNL. The estimated background levels shown include biological, geophysical, climatic, and anthropogenic components. Most of the land beneath the proposed Duke MOA is rural; however, there are several small towns and villages. In general, background levels are above 50 dBA DNL in the population centers, and less than 50 dBA DNL in more remote areas, such as wild and natural areas, state parks, and state forests.



Source: ASA 2013.

Figure 3-9. Points of Interest and Background Noise Levels

3.2.5 Existing Overall Aircraft Noise

DNL is the average sound energy in a 24-hour period with a penalty added to the nighttime levels. L_{dnmr} is the average sound energy in a 24-hour period with a 10 dB penalty added to the nighttime levels, and up-to an additional 11 dB penalty for overflights with rapid onset rates. The estimated DNL and L_{dnmr} from existing aircraft operations are both less than 35 dBA in areas beneath the Duke MOA. The overall average noise from aircraft operations is greater than 10 dBA DNL lower than the background noise levels beneath the existing MOA, and do not contribute appreciably to the overall background levels throughout the region. In general, the aircraft operations are spread throughout the 2,178 SNM beneath the existing Duke MOA. Noise from existing aircraft operations does not exceed 65 dBA DNL, and is compatible with all land uses (DAF 2017 and FAA 2015a). The FAA's determination of significant impacts on land use also considers the significance of impacts in other resource categories. Approximately one aircraft every one to two days flies under the southwest portion of the Duke MOA on VR-704/VR707. These MTR operations are very small and do not contribute to the overall sound levels under the Duke MOA.

3.2.6 Individual Overflight Noise

Although operational noise levels are too low to result in incompatibility with existing land uses, noise from individual overflights generate distinct acoustical events that exist momentarily (e.g., clap of thunder). **Table 3-8** outlines the L_{max} and SEL for individual aircraft overflights for the primary users of the existing Duke MOA. L_{max} and SEL are completely different from DNL. L_{max} is the maximum sound level of an acoustic event (e.g., when an aircraft is directly overhead). SEL is a measure of the total energy of an acoustic event. It represents the level of a one-second long constant sound that would generate the same energy as the actual time-varying noise event such as an aircraft overflight. Elevations under the Duke MOA range from approximately 1,000 ft to 2,000 ft MSL, and 6,000 ft AGL outlined in **Table 3-8** is representative of the lower portions of the existing Duke MOA (8,000 ft to 9,000 ft MSL).

Table 3-8. Estimated Sound Levels for Individual Overflights

Altitude (ft AGL)	L_{max} (dBA)[a]			SEL (dBA)[b]		
	A-10C[c]	F-16C[d]	C-130J[e]	A-10C[c]	F-16C[d]	C-130J[e]
6,000	74	78	62	81	87	72
10,000	64	70	54	74	80	66
20,000	-	58	44	-	70	57

Source: DAF 2021.
Notes:
[a] L_{max} is the maximum sound level during an individual overflight.
[b] SEL is the sound level if the entire overflight was compressed into one second and does not represent the actual noise at any given time.
[c] A-10C operating at 97% Engine Core RPM (NC) at 350 knots.
[d] F-16C operating at 90% NC at 450 knots.
[e] C-130J operating at 1400 HP at 200 knots.

Mid-altitude overflights in the existing MOA are similar to, but somewhat louder than high altitude commercial aircraft overflights. Overflights conducted in the existing Duke MOA are distant but

audible to individuals who are outdoors. Effects from these mid-level overflights are distributed throughout areas below and adjacent to the existing Duke MOA. These overflights are brief, intermittent, distributed throughout the MOA, and normally do not occur repeatedly at any one location. While these levels would be perceptible, they would be well below the threshold of 65 DNL considered to be incompatible with existing land uses beneath the existing Duke MOA.

Speech Interference. In general, low- to mid-altitude aircraft overflights can interfere with communication on the ground, and in homes, schools or other buildings directly under their flight path. The disruption of routine activities in the home, such as radio or television listening, telephone use, or family conversation, can give rise to frustration and irritation. The threshold at which aircraft noise may begin to interfere with speech and communication is 75 dBA (DNWG 2009). This level is consistent with, and more conservative than, the thresholds outlined in the American National Standards Institute's *Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools* (ANSI 2010). **Table 3-8** outlines the L_{max} for individual aircraft overflights for the primary users of the existing Duke MOA. L_{max} at 6,000 ft AGL are 74 dBA for an A-10C, 78 dBA for an F-16C, and 62 dBA for a C-130J. On occasions, F-16Cs operating in the lower levels of the existing Duke MOA are loud enough to cause brief interruptions in speech on the ground; whereas, A-10C and C-130J are not normally loud enough to interfere with communication on the ground.

Damage to Hearing. The USEPA has identified 55 decibel (dB) DNL as a level that protects public health and welfare with an adequate margin of safety (USEPA 1974). This means that 55 dB DNL is a threshold below which adverse noise effects are usually not expected to occur. 65 dB DNL is widely used as a noise criterion for airports. It represents a compromise between acceptable noise and economic practicality. According to the Federal Interagency Committee on Urban Noise, noise exposure greater than 65 dB DNL is considered generally incompatible with residential, public use (i.e., schools), or recreational and entertainment areas (Federal Interagency Committee on Urban Noise 1990).

Noise-related hearing loss due to long-term exposure (many years) to continuous noise in the workplace has been studied extensively, but there has been little research on the potential for noise induced hearing loss on members of the community from exposure to aircraft noise. Unlike workplace noise, community exposure to aircraft overflights is not continuous, but consists of individual events where the sound level exceeds the background level for a limited time. Over 40 years, an individual would need to be exposed to average sound level of 75 dBA, 8 hours per day for 40 years to experience hearing loss (CHABA 1977), as such Occupational Safety & Health Administration (OSHA) and the ANG have adopted an exposure of 80 dBA for 8 hours per day as the threshold for hearing protection (DAF 2016). As aircraft overflights are intermittent and not continuous, no individuals are exposed to sound levels exceeding 80 dBA for 8 hours per day beneath the Duke MOA. In addition, OSHA and the ANG have adopted a threshold of 140 dB instantaneous noise level as a threshold for short-term exposure that may induce hearing loss. As individual aircraft overflights within the Duke MOA are not supersonic, and do not generate sonic

booms, no individuals beneath the MOA are exposed to instantaneous sound levels exceeding 140 dB.

Damage to Structures. Noise vibrations from low-level aircraft overflights can cause buildings under their flight path to vibrate, which the occupants experience as shaking of the structure and rattling of the windows. However, based on experimental data and models, noise and vibrations from subsonic aircraft overflights do not cause structural damage to buildings. An impact noise (i.e., blast noise or sonic boom) above 140 dB is required to generate sufficient energy to damage structures (Siskind 1989, and Bureau of Mines 1980). Individual overflights within the Duke MOA are not supersonic, and do not generate sonic booms above 140 dB; therefore, there is no potential to cause damage to structures.

3.2.7 Significance Criteria

The FAA significance criteria indicates that the effects from noise would not be considered significant unless the Proposed Action would (1) increase noise levels by more than 1.5 dBA DNL in a noise sensitive area exposed to noise above 65 dBA DNL, or (2) that a noise sensitive area is exposed to noise levels at or above 65 dBA DNL due to a 1.5 dB DNL increase when compared to the No Action Alternative for the same timeframe. In addition, if individual acoustic events generate noise levels loud enough to damage hearing or structures, it would be considered significant. Although the Proposed Action would not result in significant effects, this EA includes a discussion of effects to both individuals and sensitive land uses from changes in the overall average noise and noise from individual overflights.

3.2.8 Environmental Consequences of the Proposed Action

The Proposed Action would not result in significant effects on the noise environment. Effects would be due to noise from the introduction of low-altitude military overflights in areas beneath the proposed Duke Low MOA. The Proposed Action would not increase noise levels by more than 1.5 dBA DNL in a noise sensitive area that is exposed to noise above 65 dBA DNL, nor would it generate individual acoustic events loud enough to damage hearing or structures. The Proposed Action would incrementally increase the overall background sound levels (DNL) between 0.1 and 0.3 dBA in areas beneath the proposed Duke Low MOA, including land within wild and natural areas, state parks, and state forests.

3.2.8.1 Overall Aircraft Noise

DNL is the average sound energy in a 24-hour period with a penalty added to the nighttime levels. L_{dnmr} is the average sound energy in a 24-hour period with a 10 dB penalty added to the nighttime levels, and up-to an additional 11 dB penalty for overflights with rapid onset rates. **Table 3-9** outlines the overall sound levels for points of interest under the Duke MOA and proposed Duke Low MOA. These estimates include the aircraft avoidance and mitigation areas shown in **Figure 2-3**. The existing range of background noise of 47.1 to 52.9 dBA DNL would increase to a range

of 47.4 to 53.0 dBA DNL for the 24 representative locations under the proposed Duke Low MOA. The estimated L_{dnmr} (i.e., busiest month noise) would increase from a range of 47.1 to 52.9 dBA to 48.4 to 53.3 dBA beneath the proposed Duke Low MOA. The overall average noise environment would be similar to, but slightly greater than, existing background levels in areas beneath the proposed Duke Low MOA.

Land Use Compatibility. Noise from aircraft operations under the Proposed Action would not exceed 65 dBA DNL and would be compatible with all land uses (DAF 2017; FAA 2015a). This includes being compatible with all wilderness areas, residential areas, churches, schools, and recreational areas underneath the proposed Duke Low MOA. Detailed guidelines for the compatibility of various land uses with noise exposure levels are included in **Appendix F**, *Noise Analysis*. These effects would not be considered significant.

Change in Overall Noise. The Proposed Action would increase overall noise levels by between 0.1 and 1.3 dBA L_{dnmr} and 0.1 and 0.3 dBA DNL for areas beneath the proposed Duke Low MOA. These changes in noise levels would not be perceptible when compared to existing conditions, and noise from aircraft would continue not to contribute appreciably to the overall background levels throughout the region. These changes in noise would not be "reportable" under FAA guidance (FAA Order 1050.1F), and these effects would not be considered significant. The Proposed Action would increase overall noise levels by between 0.4 and 1.3 dBA L_{dnmr} and 0.1 to 0.3 dBA DNL for all state parks and forests, and other wildlife and recreational areas under the proposed Duke Low MOA. This would constitute a negligible increase in the annual average noise when compared to existing conditions.

The overall levels with the Proposed Action for all areas under the proposed Duke Low MOA would be well below the 65 DNL threshold for land use restrictions (FICUN 1990; FAA 2015a; and DAF 2020).

Table 3-9. Overall Sound Levels With and Without the Proposed Action

Points of Interest	Overall Sound Levels (dBA)				
		DNL		L_{dnmr}	
	Existing Background Level (DNL/Ldnmr)	With Proposed Aircraft Noise	Change from Existing	With Proposed Aircraft Noise	Change from Existing
Population Centers (Geographical Centers)					
Cherry Springs	47.8	48.0	0.2	48.9	1.2
Coudersport	52.6	52.7	0.1	53.0	0.4
Gaines	51.2	51.3	0.1	51.3	0.1
Oswayo	49.3	49.5	0.2	50.1	0.9
Port Allegany	52.2	52.3	0.1	52.7	0.5
Roulette	51.7	51.8	0.1	52.2	0.5
Sabinsville	52.9	53.0	0.1	53.3	0.4
Saint Marys	52.9	53.0	0.1	53.0	0.1
Shingles House	50.7	50.8	0.1	51.3	0.6
Smethport	52.1	52.2	0.1	52.2	0.1
Ulysses	51.8	51.9	0.1	52.3	0.5
Wildlife/Recreational Areas					
Austin Dam	49.2	49.4	0.2	50.1	0.9
Denton Hill State Park	47.4	47.6	0.3	48.6	1.2
Forrest Dutlinger Natural Area	49.4	49.5	0.2	49.8	0.5
Hammersley Wild Area	48.6	48.8	0.2	49.2	0.5
Kettle Creek	50.6	50.7	0.1	50.9	0.4
Lyman Run	48.3	48.6	0.2	49.4	1.0
Patterson State Park	47.1	47.4	0.3	48.4	1.3
Pine Tree Trail - Natural Area	48.2	48.4	0.2	49.1	0.9
Prouty Place State Park	47.3	47.6	0.3	48.6	1.3
Sinnemahoning State Park	52.3	52.4	0.1	52.8	0.4
Sizerville State Park	49.9	50.0	0.2	50.6	0.7
Square Timber Wild Area	48.1	48.3	0.2	49.2	1.1
Tamarack Swamp	48.9	49.1	0.2	49.9	0.9

Source for existing background noise level: ASA 2013.

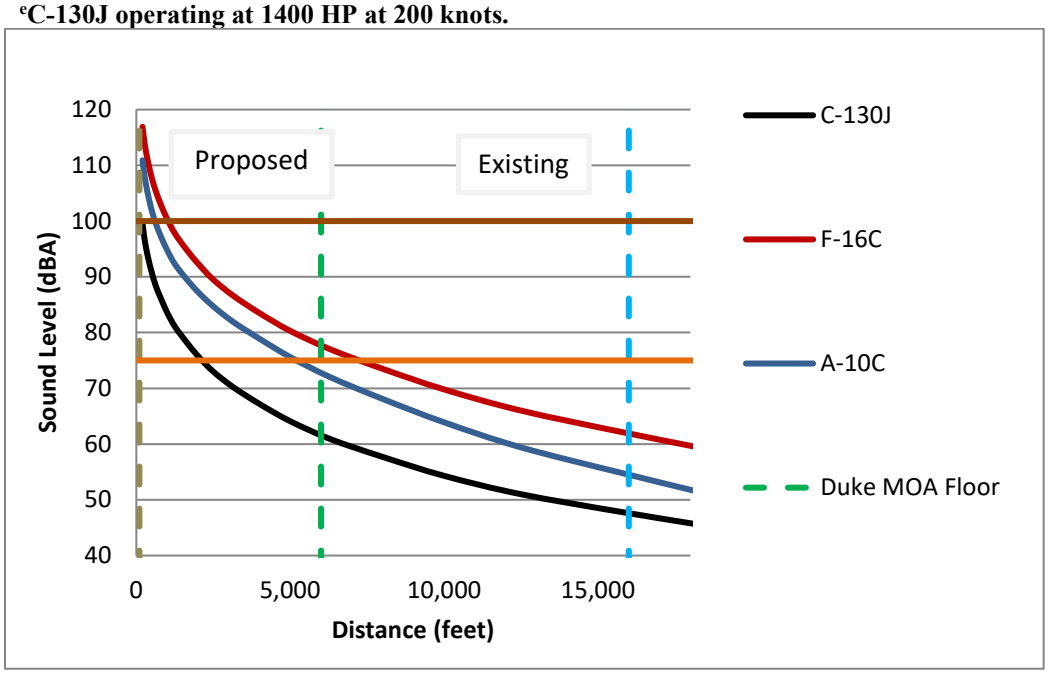
3.2.8.2 Individual Overflight Noise

Noise levels for individual overflights would be appreciably higher than existing conditions for areas beneath the Duke Low MOA. L_{max} and SEL are completely different from DNL. L_{max} is the maximum sound level of an acoustic event (e.g. when an aircraft is directly overhead). SEL is a measure of the total energy of an acoustic event. It represents the level of a one-second long constant sound that would generate the same energy as the actual time-varying noise event such as an aircraft overflight. Areas beneath the proposed MOA would intermittently experience aircraft overflights that would range from loud to very loud, exceeding 75 dBA L_{max} at any given point on the ground (**Table 3-10** and **Figure 3-10**). Elevations under the Duke MOA range from approximately 1,000 ft to 2,000 ft above MSL, and 6,000' AGL outlined in **Table 3-5** is representative of the lower portions of the existing Duke MOA (8,000' to 9,000' above MSL).

Table 3-10. Estimated Sound Levels for Individual Overflights

Altitude (ft AGL)	L_{max} (dBA)[a]			SEL (dBA)[b]		
	A-10C[c]	F-16C[d]	C-130J[e]	A-10C[c]	F-16C[e]	C-130J[e]
100	114	-	-	113	-	-
500	102	108	91	104	110	94
1,000	95	100	84	98	105	89
5,000	74	78	62	81	87	72
10,000	64	70	54	74	80	66
20,000	-	58	44	--	70	57

Source: DAF 2021
Notes:
[a] L_{max} is the maximum sound level during an individual overflight.
[b] SEL is the sound level if the entire overflight was compressed into one second and does not represent the actual noise at any given time.
[c] A-10C operating at 97% Engine Core RPM (NC) at 350 knots.
[d] F-16C operating at 90% NC at 450 knots.
[e]C-130J operating at 1400 HP at 200 knots.



Source: DAF 2021 and DNWG 2009.
Note: L_{max} is the maximum sound level during the overflight.

Figure 3-10. Estimated Lmax for Individual Overflights

Table 3-11 outlines the lateral distance on the ground from a flight track where aircraft interfere with outdoor speech. For overflights at the indicated altitudes and lateral distances indicated, aircraft noise would be loud enough to briefly interfere with individuals talking. Individuals would need to briefly pause and allow the overflights to pass before continuing with general conversation. An F-16C operating in the Duke Low MOA would interfere with speech for individuals within approximately 0.9 to 1.3 miles of the flight track directly below the aircraft. An A-10C would

interfere with speech for individuals within 0.9 miles, and a C-130J would interfere with speech for individuals within 0.3 to 0.4 miles of the flight track directly below the aircraft.

Table 3-11. Lateral Distance from Flight Track for Speech Interference

	Overflight Altitude (ft AGL)		
	500	1,000	5,000
Aircraft	Lateral Distance from Flight Track for Speech Interference [ft (miles)]		
A-10C	4,975 (0.9)	4,899 (0.9)	
F-16C	6,982 (1.3)	6,928 (1.3)	4,899 (0.9)
C-130J	1,936 (0.4)	1,732 (0.3)	

Source: DAF 2021

Additional Considerations. Several flight constraints would be in effect in certain areas and times of year in the proposed Duke Low MOA, limiting the loudest noise levels at these times and places:

- AFMAN 11-203v3*, Flight Operations*, requires flights over towns and other congested areas to remain more than 1,000 ft above the highest obstacle within 2,000 ft horizontally of the aircraft, and in uncongested areas, aircraft should not fly within 500 ft of any person, vehicle, or structure.

- FAA Advisory Circular 91-36D, *Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas*, was implemented to mitigate complaints concerning low flying aircraft over federally owned noise sensitive, including areas such as National Parks, National Wildlife Refuges, Waterfowl Production Areas, and Wilderness Areas. This Advisory Circular recommends pilots make every effort to fly at altitudes no less than 2,000 ft AGL, unless doing so would be expedient to accomplishing their mission over federally owned noise sensitive areas. No federally owned noise sensitive areas are located beneath the proposed Duke Low MOA.

- Exclusions and avoidance areas with minimum overflight altitudes would be established in certain places beneath the proposed Duke Low MOA, including population centers, wild and natural areas, state parks, and recreational areas. Minimum overflight altitude mitigation over state parks and state forests are illustrated on **Figure 2-3**.

Implementing these constraints would move aircraft overflights and associated noise to other less sensitive areas beneath the 1.4 million acres of the proposed Duke Low MOA.

Even at times and places within the proposed Duke Low MOA where no special flight restrictions apply, experiencing noise from an aircraft that is both overhead and at the lowest possible altitude would be rare. In addition to AFMAN 11-203v3 and other restrictions outlined above, the frequency of low altitude overflights is limited by these factors:

- Flight at low altitudes requires an extreme level of vigilance on the part of the aircrew, and time spent at the lowest available altitudes would be very limited and only as needed to accomplish very specific training requirements.

- The proposed Duke MOA encompasses a large area, and any particular location on the ground would be overflown at low altitudes relatively infrequently.

- For a person on the ground, the airspace that is "overhead" (i.e., within 45 degrees of the horizon) increases with altitude, such that only 0.03 square miles is "overhead" at 500 ft AGL, 0.11 square miles at 1,000 ft AGL, and 0.45 square miles at 2,000 ft AGL. This combined with the vast distribution of aircraft within the proposed Duke Low MOA and the limited amount of time at these altitudes, the time an aircraft was "overhead" at any given point on the ground would be extremely limited (e.g., seconds to minutes per year).

Damage to Hearing or Structures. As with existing conditions, and for similar reasons, aircraft overflights would not generate individual acoustic events loud enough to damage hearing or structures. Although aircraft overflights would not be loud enough to damage hearing or structures, individual low-level overflights would be loud and abrupt enough to startle individuals and cause readily perceptible vibrations in homes and buildings directly under their flight paths. These effects would not be considered significant.

Conclusions. The Proposed Action would not result in significant adverse effects on the noise environment. Minor effects would be due to noise from the introduction of low-altitude military overflights in areas beneath the proposed Duke Low MOA. The Proposed Action would not increase noise levels by more than 1.5 dBA DNL in a noise sensitive area that is exposed to noise above 65 dBA DNL, nor would it generate individual acoustic events loud enough to damage hearing or structures. The Proposed Action would not increase noise levels by more than 5 dBA DNL in rural and remote areas beneath the proposed Duke Low MOA, this includes wild and natural areas, state parks, and state forests.

3.2.9 No Action Alternative

Selecting the No Action Alternative would result in no change in effects on the noise environment. The modification to the existing Duke MOA would not occur. The noise environment would remain unchanged when compared to existing conditions.

3.3 LAND USE

3.3.1 Definition of Resource

"Land use" is the term used to describe the human use of land. It represents the economic and cultural activities (e.g., agricultural, residential, industrial, mining, and recreational uses) that are practiced at a given place. Public and private lands frequently represent very different uses. For example, urban development seldom occurs on publicly owned lands (e.g., parks, federally designated wilderness areas and state designated wild areas), while privately owned lands are infrequently protected for wilderness (wildland) uses.

Land use differs from land cover in that some uses are not always physically obvious (e.g., land used for producing timber but not harvested for many years and forested land designated as wild or natural areas will both appear as forest-covered, but they have different uses). Natural land use categories include state and national forests, wild and scenic rivers, state and national parks, federally designated wilderness areas, state designated wild areas, and other similar areas. Human-modified land categories include recreation areas, agricultural areas, research areas, pipelines and powerlines, airports and private airstrips, and other areas developed from natural land cover conditions. Sensitive land use includes those uses intended to preserve natural or cultural resources, contain unique recreational opportunities and public access, or provide for the integrated management of public lands.

3.3.2 Affected Environment

The North Central Pennsylvania Region has developed a Regional Action Plan to enhance the integration of transportation and land use planning with economic development for Cameron, Clearfield, Elk, Jefferson, McKean and Potter counties (North Central Pennsylvania Regional Planning and Development Commission, 2022). The keystone principle to maintain and improve recreational and heritage assets and infrastructure includes parks and forests, greenways and trails, heritage parks, historic sites and resources, fishing and boating areas, and game lands offering recreational and cultural opportunities to Pennsylvanians and visitors. Additional keystone principles include reuse and redevelopment of brownfields and previously developed sites in urban, suburban, and rural communities; conserve Pennsylvania's exceptional heritage resources; improve existing utilities and transportation infrastructure; support infill and greenfield development that conserves land and is consistent with other land uses; increase job opportunities and foster sustainable businesses; promote development that respects and enhances the state's natural lands and resources; enhance recreational and heritage resources; and expand housing opportunities.

The Tri-County Comprehensive Plan (Funkhouser et al. 2019) for Cameron, McKean, and Potter counties covers most of the land beneath the proposed Duke Low MOA. This region is described as one of the best outdoor recreation destinations in North America. The region is largely rural and forested, has a rich history and unique small-town culture, and offers breathtaking beauty and fresh air. Increasing tourism, agriculture, and natural resources are among the primary goals to strengthen the economic base in the region.

Figures 3-11 and **3-12** show the natural land use features and designated land use under the proposed airspace. There are 29,053 acres of State Parks and 406,250 acres of State Forests, with 21 designated recreational areas (campgrounds) beneath the proposed Duke Low MOA. In accordance with Article 1 Section 27 of Pennsylvania's constitution, state parks and forests are in the public natural resource trust. There are 15 areas within the Pennsylvania state forest system designated as Wild Areas (see **Figure 2-3**). These state forest wild areas include large expanses of relatively undisturbed forest that are set aside to protect wild character. They have very limited

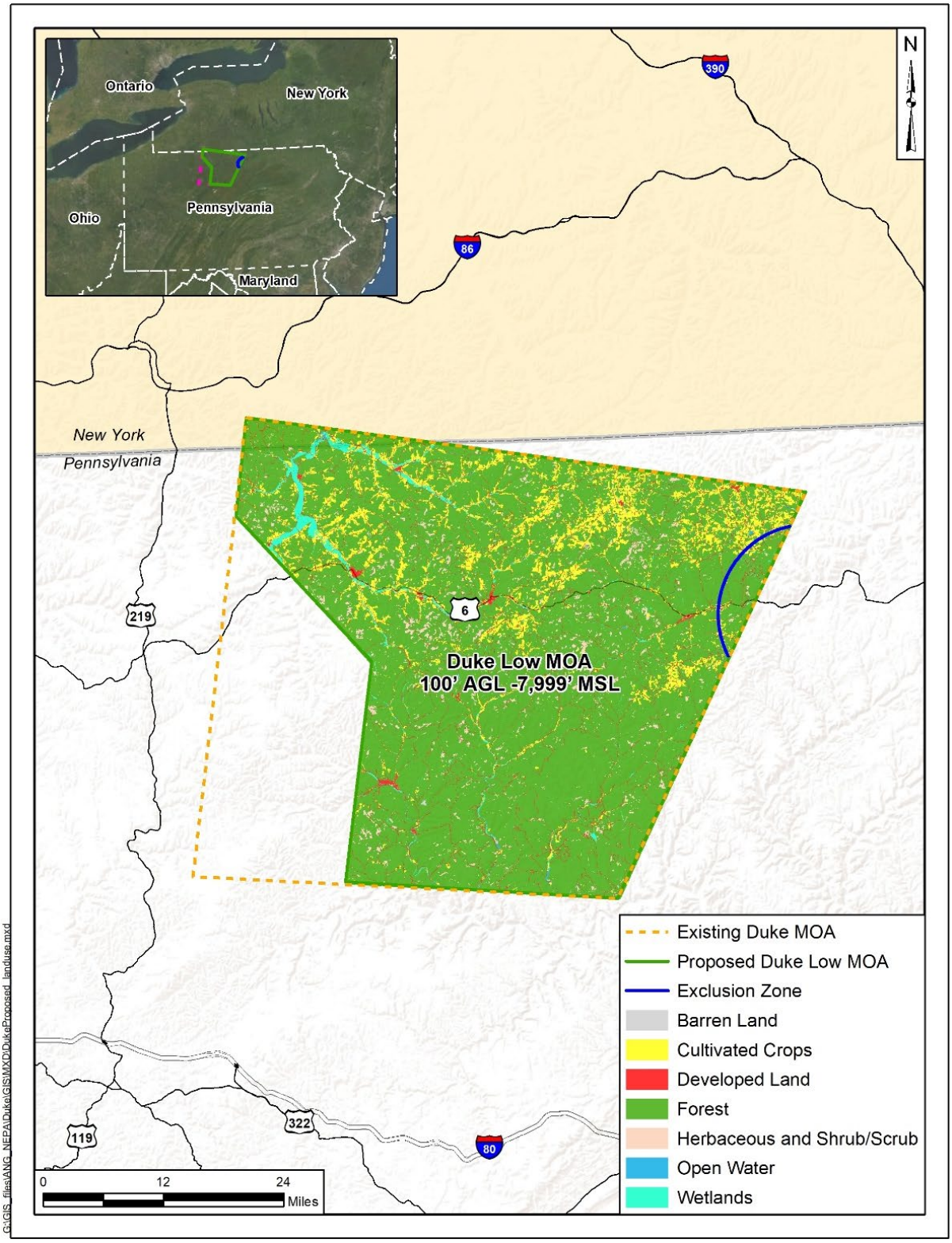
human disturbance, including roads and management activities such as timber removal. They are open to the public for recreation and enjoyment. There are no national forests or federally designated wilderness areas underlying the proposal. There are no national or state designated wild and scenic rivers under the proposed airspace (PA DCNR 2022a). The natural land features under the proposed Duke Low MOA include 919,100 acres of forest; 33,800 acres of herbaceous and scrub/shrub land; 1,367 acres of open water; 18,560 acres of wetlands; and 32,900 acres of barren or sparsely vegetated land with rock cover.

The proposed Duke Low MOA would overlay part of the Pennsylvania Wilds region, over two million acres of public land managed for conservation and outdoor recreation (Figure 3-13) (Pennsylvania Wilds, 2022). It is one of the most rural and sparsely populated regions of Pennsylvania. The Pennsylvania Wilds region contains the greatest concentration of public lands in the state, the largest wild elk herd in the Northeast, two designated National Wild & Scenic Rivers, thousands of miles of land and water trails, and some of the darkest night skies in the country. The region contains 29 state parks, eight state forests, and 50 state game lands. The region provides outdoor recreation for hikers, bikers, backpackers, campers, hunters, fishermen, horseback riders, cross-country skiers, boaters, wildlife watchers, and astronomers and stargazers. Tourism is a driving economic force in the region, accounting for a $1.8 billion industry that makes up 11 percent of the economy in the Pennsylvania Wilds region (Tourism Economics 2019). Cherry Springs State Park is a remote and wild state park, named for the large stands of black cherry trees originally found in the area. Night sky enthusiasts flock to the park to experience dark skies and views of the Milky Way, planets, and hard to see phenomena (PA DCNR 2022b).

3.3.3 Significance Criteria

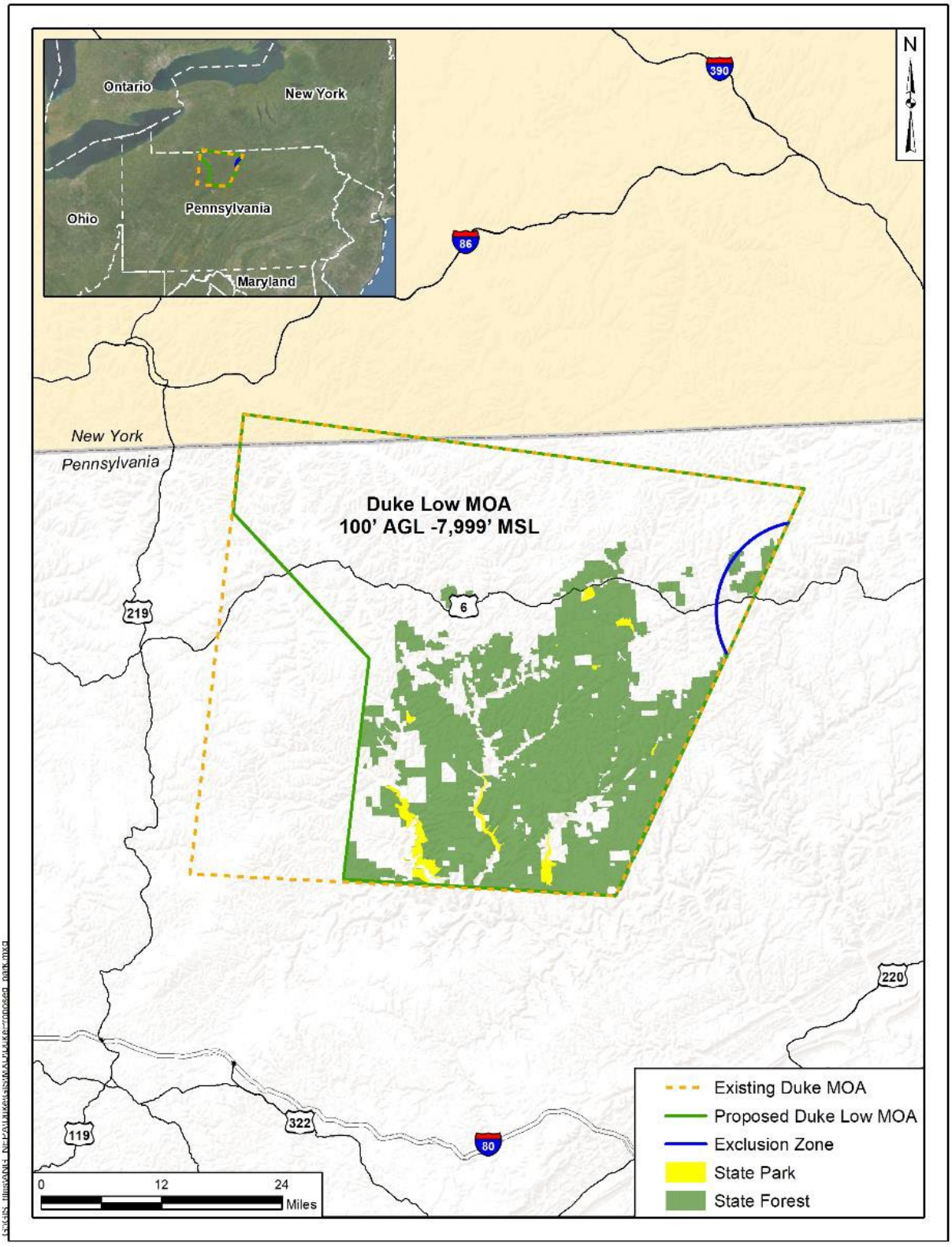
Effects on land use would be considered significant if the Proposed Action would: 1) be inconsistent with applicable land use plans or policies; 2) preclude an existing land use; 3) preclude continued use of an area; or 4) be incompatible with adjacent or vicinity land use to the extent that public health or safety is endangered. The analysis of environmental effects includes assessment of the regulatory setting for existing land uses and spatial analysis of land uses.

The FAA does not identify specific, independent factors when considering the significance of potential land use impacts. The FAA's determination of significant impacts on land use considers the significance of impacts in other resource categories, including but not limited to outdoor recreation, tourism, and socioeconomics. A land use impact would occur if a noise level over a land use was greater than the compatible noise levels associated with a range of land use activities presented in FAA Order 1050.1F. For the purposes of this EA, a significant impact would occur if noise levels increased by 1.5 dB or more at or above 65 dBA DNL.



Source: NLCD https://www.mrlc.gov/

Figure 3-11. Natural Land Use Features



Source: PA DCNR 2022c

Figure 3-12. Designated Land Use Features

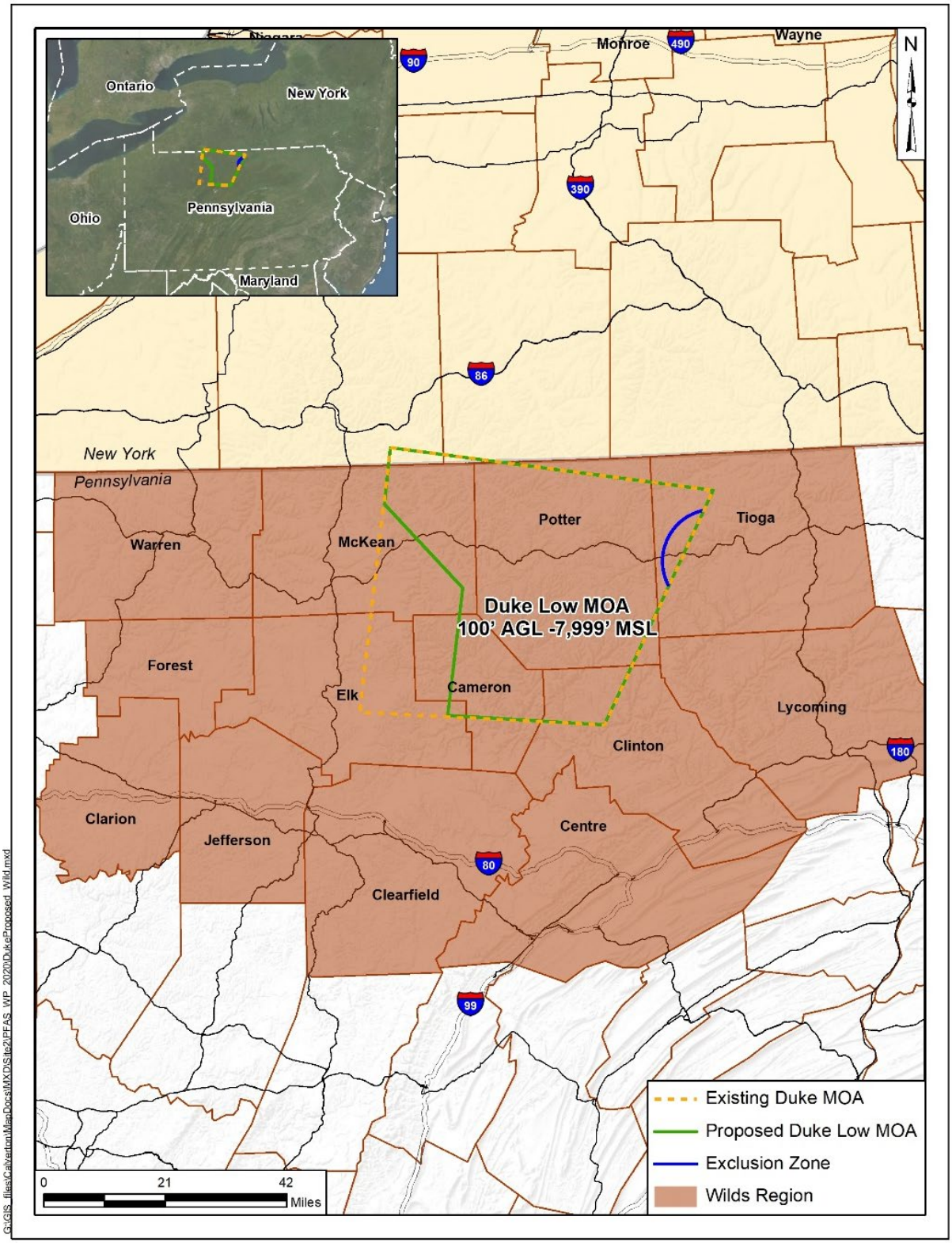
3.3.4 Environmental Consequences of the Proposed Action

The Proposed Action would not result in significant impacts to land use. Effects would be due to the intermittent introduction of low-altitude military overflights within the proposed Duke Low MOA. There would be no short- or long-term changes in land use due to the Proposed Action. There would be no changes in personnel, no construction, and no changes in ground-based operations or training due to the Proposed Action. The Proposed Action would not 1) be inconsistent with applicable land use plans or policies; 2) preclude an existing land use; 3) preclude continued use of an area; or 4) be incompatible with adjacent or vicinity land use to the extent that public health or safety is endangered. All land uses would remain unchanged when compared to existing conditions. The NGB and the 175 WG prepared have proposed altitudinal mitigation measures (see **Figure 2-3**) to address concerns associated with sensitive areas concerns while ensuring the Maryland ANG A-10C training mission needs are met to further clarify the components of the Proposed Action.

Changes in the natural or constructed environment that alter, detract, or eliminate use or enjoyment of a place affect overall land use. Since the Proposed Action would not involve any ground disturbing activities, the potential effects on land use would be associated with noise from aircraft operations in the proposed Duke Low MOA. Aircraft operations in the existing Kinzua ATCAA (18,000-45,000 ft MSL) overlying the Duke MOA would be comparable to high altitude civilian aircraft and would not generate sound levels loud enough to affect land use or land users; therefore, they were not carried forward for detailed evaluation.

In accordance with AFMAN 11-202v3, aircraft would continue to follow low-level guidance and remain 1,000 ft above the highest obstacle and 2,000 ft laterally when over congested or populated areas, as well as 500 ft above all known or observed antennas and obstacles. All obstacles within the proposed Duke Low MOA would be documented by pilots to ensure avoidance during training missions. In addition, pilots would continue to employ see and avoid tactics and avoidance of noise-sensitive areas would be emphasized to all flying units using the Duke MOA (see **Chapter 5**, Management Actions and Special Procedures).

The FAA considers 65 dBA DNL as the threshold of significance for assessing noise impacts (refer to **Section 3.2**, Noise). However, special consideration is given to the impacts of noise in areas where the ambient noise environment is very low, and a quiet setting is a generally recognized purpose and attribute. Under the Proposed Action, no areas beneath the proposed Duke Low MOA would experience noise levels greater than or equal to the 65 dBA DNL threshold. In addition, the Proposed Action would not exceed the FAA significance threshold in rural and remote areas, including wild and natural areas. Areas beneath the proposed Duke Low MOA would experience an overall increase in noise levels by between 0.4 and 1.3 dBA L_{dnmr} and 0.1 to 0.3 dBA DNL. Since the increase in noise would be less than the FAA significance threshold, noise impacts associated with implementation of the Proposed Action would not be significant. Noise effects are described in greater detail in **Section 3.2**, Noise.



Source: PA Wild Center https://www.pawildscenter.org/about-us/attachment/map-pa-wilds-2017-low-res/

Figure 3-13. Pennsylvania Wilds Region

3.3.4.1 Duke Low MOA

The proposed Duke Low MOA extends above land uses considered sensitive. Sensitive areas include historic properties, parks and recreation areas, state forests, state designated wild areas, and research areas. Aircraft operations and the periodic occurrence of aircraft-generated noise above sensitive land use settings could be perceived as intrusive. The Proposed Action would not increase noise levels by more than 1.5 dBA DNL in a noise sensitive area that is exposed to noise above 65 dBA DNL or generate individual acoustic events loud enough to damage hearing or structures. The Proposed Action would incrementally increase the overall background sound levels (DNL) between 0.1 and 0.3 dBA in areas beneath the proposed Duke Low MOA, including land within sensitive areas, such as wild and natural areas, state parks, and state forests. The Proposed Action would increase overall noise levels by between 0.4 and 1.3 dBA L_{dnmr} and 0.1 to 0.3 dBA DNL for all state parks and forests, and other wildlife and recreational areas under the proposed Duke Low MOA. This would constitute a negligible increase in the annual average noise when compared to existing conditions for the 24 points of interest (see **Figure 3-9** and **Table 3-9**) under the proposed Duke Low MOA. Aircraft operations would be dispersed throughout the proposed airspace. Noise effects would be intermittent over any given area, and no areas would be exposed to noise effects for an extended period of time. The overall average noise environment would be similar to, but slightly greater than, existing background levels in areas beneath the Duke MOA and proposed Duke Low MOA. Therefore, effects on land use and land users would not be considered significant.

The Pennsylvania Department of Environmental Protection (DEP) advised on the potential presence of multiple temporary oil and gas drilling rigs that may be erected more than 100 ft above the ground. A map of locations where the DEP has issued permits in the last 16 months for drilling rigs that could exceed 100 ft in height is presented in **Figure 3-14**. In accordance with AFMAN 11-202v3, aircraft would continue to follow low-level guidance and remain 500 ft above all known or observed antennas and obstacles. Therefore, effects on land use for oil and gas drilling would not be considered significant.

The USEPA indicated that aircraft operations in the existing Duke MOA above 8,000 ft MSL may have minimal effects on the Pennsylvania Wilds region and that low-flying aircraft in the proposed Duke Low MOA could impact residents in the rural areas and the natural experience of visitors.

The Pennsylvania Wilds region is responsible for $1.8 billion in nature and heritage tourism. As a trustee of Pennsylvania's natural resources, PA DCNR is mandated to prevent and remedy any degradation, diminution, or depletion of the natural resources. The Proposed Action would not alter, prohibit, or otherwise limit the public's access to the recreational areas beneath the proposed Duke Low MOA. PA DCNR advised that six state forests, thousands of acres of forest and wild and natural areas, and 12 state parks would be affected by the Proposed Action. PA DCNR provided recommendations to lessen the anticipated impacts of the Proposed Action on hunting by avoiding interference with key recreational activities (see **Appendix A** for further information).

The Proposed Action would comply with this recommendation to the extent practicable by minimizing interference with hunting activities because there would be very little use on weekends, no use on federal holidays, and the majority of hours (approximately two hours per activation day) used would occur during the mid-day, when hunting is least affected. Early morning and late evening are the times when wildlife is most active, and the airspace would not be used. Wildlife such as elk are most active around dusk and dawn, which are outside of the proposed Duke Low MOA activation periods (Banfield and Rosenberry 2020). The nature and tempo of the Proposed Action would not be at a level that individuals recreating and hunting within the Duke Low MOA would experience extreme, consistent or daily overflights. As indicated below, management actions and special procedures (see **Chapter 5**), and altitudinal mitigation (see **Figure 2-3**) for state parks and state forests would be implemented to further reduce the effects on land use, which are not considered significant.

Individual overflights would be loud enough to momentarily interrupt speech on the ground. These events would annoy some individuals beneath the proposed Duke Low MOA, but would not be frequent enough to create areas of incompatible land use within population centers or wild and recreational areas. Based on information provided in **Tables 2-2** and **2-3** and **Section 3.2**, the noise exposure from A-10C and F-16C operations conducted below 7,000 ft MSL would be loud enough to interfere with communication on the ground for approximately 0.7 to 1.2 miles in all directions or an average area of 2.4 square miles at any given time while in the proposed Duke Low MOA. Every four days on average an individual on the ground may experience an individual aircraft overflight that would interfere with speech on the ground for approximately 22 seconds. Utilization of the existing Duke MOA has occurred historically for decades, so aircraft noise is not new to the region; however, intermittent operations would occur at lower altitudes than what is currently conducted.

Management actions and special procedures specified in **Chapter 5** would be implemented under the Proposed Action to reduce the potential effects on outdoor recreation and conservation management. Prior to implementation of the Proposed Action, the ANG Eastern Area Defense Sector would coordinate with the PGC to establish a communications plan with protocols to allow for de-confliction of the airspace as needed during activities, such as annual species population surveys. The Proposed Action would not exceed the FAA significance threshold in rural and remote areas, including wild and natural areas. Noise levels in areas beneath the proposed Duke Low MOA would experience increases of up to 0.3 dBA DNL. Since the increase in noise would be less than the FAA significance threshold, noise impacts associated with implementation of the Proposed Action would not be significant. Aircraft would spend approximately ten minutes or less below 1,000 ft AGL in a given hour of usage during a 2-hour activation window. Overall, during each sortie, aircraft would be down in the low altitude ranges between 100 ft to 500 ft for two to three minutes per activation. The LASDT training down to 100 ft AGL would be only several seconds and less than 0.5 miles overland in the two to three minutes of flight in the low altitude ranges.

The proposed Duke Low MOA altitudinal mitigation map for state parks and state forests (see **Figure 2-3**) was prepared by the NGB and the 175 WG to address concerns for the most critical sensitive areas. Altitudinal flight modifications of 500 ft and 1,000 ft AGL are widely used by the ANG and the DAF as standardized practices for overflight altitudes over sensitive areas, such as eagle nesting sites. The altitude mitigation map developed for the proposed Duke Low MOA was specifically designed to address concerns raised by PA DCNR at specific locations. Specifically, PA DCNR raised concerns regarding potential impacts to key recreational, historical, and tourist destinations, as well as the avoidance of impacts to raptor migration and elk rut. In addition, coordination with the Pennsylvania Wilds Center indicated that the region hosts the largest wild elk herd in the Northeast. Low altitude avoidance and noise sensitive areas for the proposed airspace would be identified in the local flight instructions for pilots. Pilots would be instructed to avoid these locations by horizontal (1 NM lateral boundary) and vertical distances (500 and 1,000 ft AGL) to enhance flight safety, noise abatement, and environmental sensitivity. A 1,000 ft AGL floor would be implemented over sensitive areas of concern in the southern portions of the Duke Low MOA, specifically over the Hammersley Wild Area, Forrest H. Dutlinger Natural Area and the Kettle Creek State Park. A 500 ft AGL floor would be implemented over sensitive areas of concern in the remaining portions of the proposed Duke Low MOA, such as over the State Parks, Sinnemahoning Creek and the historical Austin Dam ruins. In addition, night operations would not occur at altitudes below 1,000 ft. Night operations currently occur within the existing Duke MOA. Considering implementation of management actions and special procedures (see **Chapter 5**), and altitudinal mitigation (see **Figure 2-3**) for state parks and state forests, the Proposed Action would not significantly impact land use.

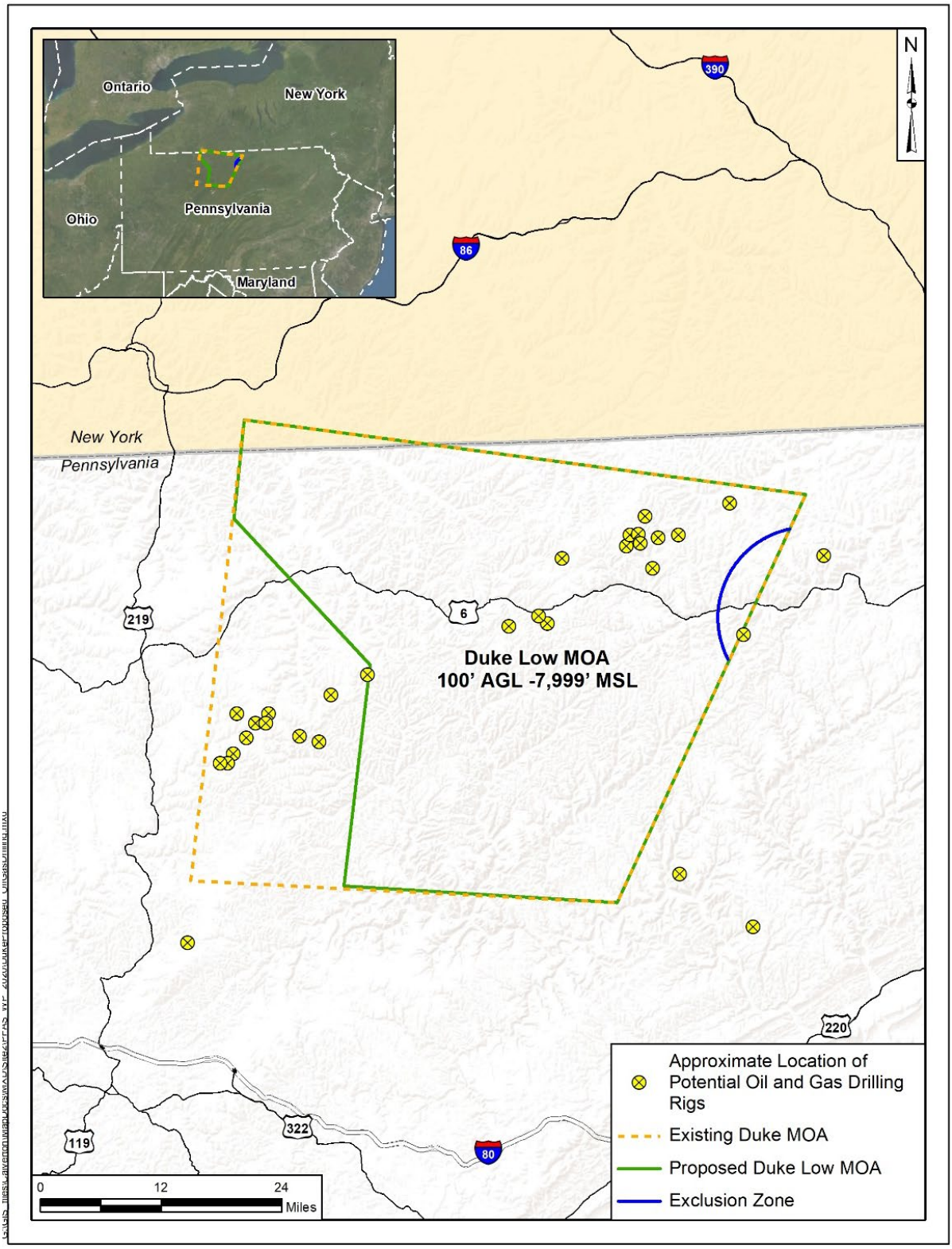
3.3.5 No Action Alternative

The No Action Alternative would result not result in significant impacts on land use or land users. Under the No Action Alternative, modification of the Duke MOA would not occur. There would be no changes in the natural or built environment that would alter, detract, or eliminate use or enjoyment of a place. Land use conditions would remain unchanged when compared to existing conditions.

3.4 BIOLOGICAL RESOURCES

3.4.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats in which they live, including vegetation, wildlife, and threatened, endangered, or sensitive species in a given area. Biological resources are necessary for ecosystem integrity. The existence and preservation of biological resources are important to society for aesthetic, recreational, and socioeconomic purposes.



Source: ArcGIS Online data. PA DEP Oil and Gas Program

Figure 3-14. Potential Oil and Gas Drilling Rigs Over 100 ft AGL

Under the Proposed Action, there would be no ground-disturbing activities, no infrastructure changes, no supersonic flight activities, no release of chaff and flares, no weapons firing, and no ordnance deployment. As a result, effects to ground-dwelling wildlife (i.e., mammals, reptiles, amphibians, fish, and invertebrates) or their associated habitats from the implementation of the Proposed Action would be negligible. In addition, water resources (i.e., wetlands, floodplains, surface waters, groundwater, or wild and scenic rivers) were dismissed from detailed analysis for the same reason. The ongoing use of chaff and flares in the existing Duke MOA would continue and represents no change in effects on biological resources.

Threatened, endangered, or sensitive species include plant and animal species listed and proposed for listing by the USFWS under the ESA, and by state natural resources agencies. The federal ESA protects federally listed endangered and threatened plant and animal species and designated critical habitats. State listed species in the Commonwealth of Pennsylvania are protected by the Fish and Boat Commission under section 2305 of the Fish and Boat Code. The law states that the Commission "may promulgate rules and regulations governing the catching, taking, killing, importation, introduction, transportation, removal, possession, selling, offering for sale or purchasing of threatened and endangered species" (Steiner 2019). Species determined to be endangered or threatened in the State of New York are protected under the Environmental Conservation Law, which authorizes the State Department of Environmental Conservation to implement and enforce protective legislature (NYDEC 2019).

3.4.2 Affected Environment

The existing Duke MOA covers approximately 2,178 SNM (1.8 million acres) over parts or all of the northern Pennsylvania counties of Elk, Cameron, Clinton, McKean, Potter, and Tioga with a small portion of the airspace lying over the state of New York in Cattaraugus and Allegany counties. The proposed Duke Low MOA would cover approximately 1,727 SNM (1.4 million acres). The rural landscape consists of extensive steeply sloping hills, ridges, and valleys of the Appalachian Mountains. Abundant forests and wildlife, as well as public land in the form of state forests, contribute greatly to the store of biological resources in this region. There are no federally designated wilderness areas, national forests, or New York state forests underlying the proposed Duke Low MOA. Pennsylvania state forests include the Susquehannock, Tioga, Elk, and Sproul forests, totaling approximately 406,255 acres (635 square miles) of public land underneath the proposed airspace (**Figure 3-15**) (PA DCNR 2022c).

3.4.2.1 Land Cover Types

Land cover can be grouped into seven generalized categories according to the National Land Cover Database (MRLC 2018) and are as follows: forest, crops and pasture, developed land, herbaceous and shrub lands, wetlands, open water, and barren land (**Figure 3-16**). Most of the airspace within the proposed Duke Low MOA would encompass counties in northern central Pennsylvania, with a small proportion of the airspace overlying parts of New York. Deciduous, evergreen, and mixed

forests comprise the majority of vegetation cover in the region, approximately 1,436 square miles (82 percent of the land beneath the proposed Duke Low MOA). Crops and pastureland are the next category of land type, covering approximately 156 square miles (9 percent of the region). Developed land and herbaceous/shrublands each account for 3 percent of the land cover underlying the proposed Duke Low MOA. The remaining 3 percent of land cover is comprised of wetlands, open water, and barren land.

3.4.2.2 Wildlife

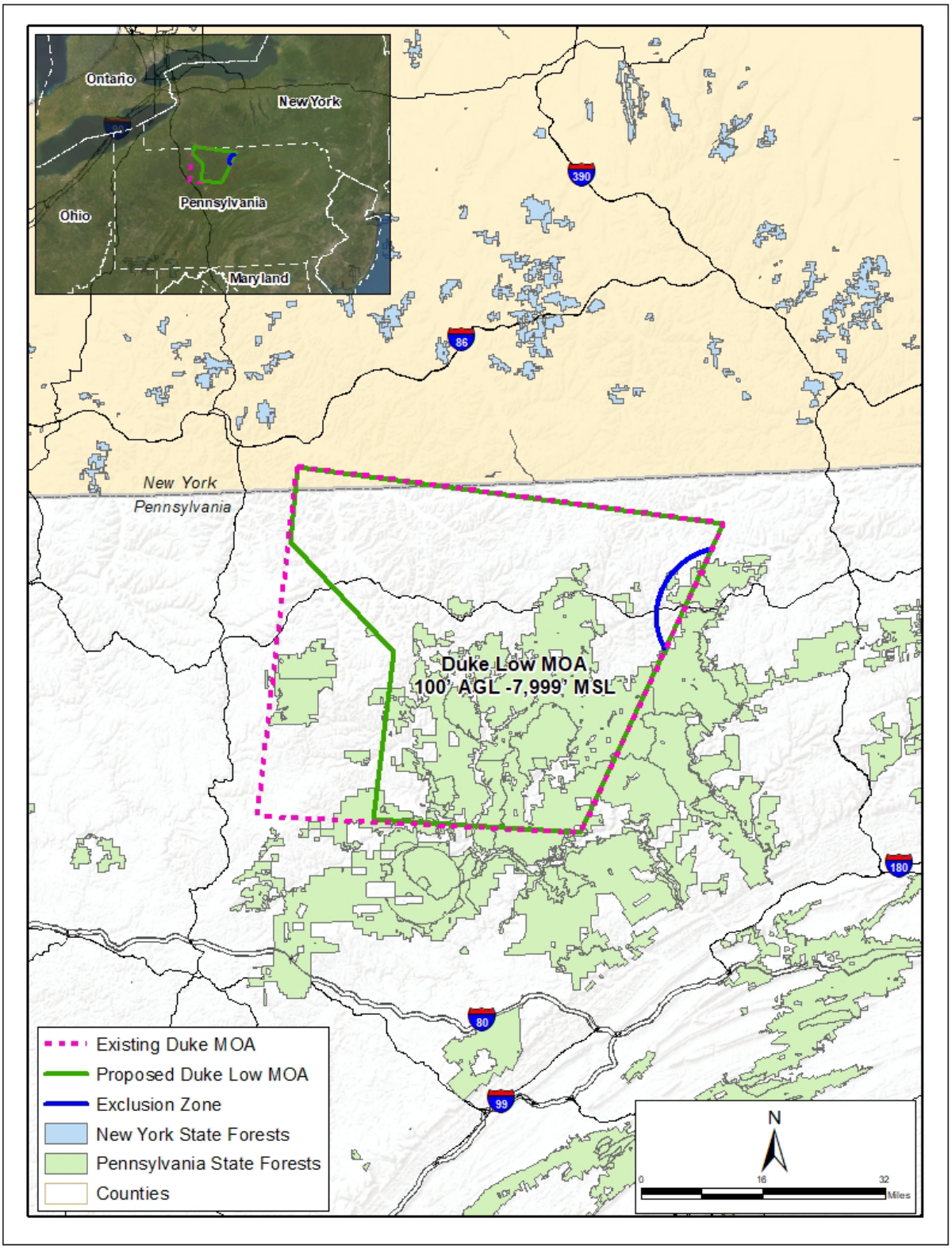
The abundant forests located in the valleys of the Appalachian Mountains in the region underlying the proposed Duke Low MOA provide habitat for a variety of wildlife. A mix of deciduous and evergreen forests create ideal environments for mammals such the Gray Fox, Northern Flying Squirrel, Northern Long-eared bat, Black Bear, Bobcat, and White-tailed Deer, and other species. Bird species found in the region include the Wood Duck, Wild Turkey, Common Loon, Double-crested Cormorant, Baltimore Oriole, Long-eared Owl, Pileated Woodpecker, Great Blue Heron, and other terrestrial and aquatic species (PGC 2019c).

There are four migratory bird flyways recognized in the U.S. that are used during the spring and fall seasons (**Figure 3-17**). Most of bird migrations occur below 3,000 ft AGL (Lincoln et al. 1998).

The Proposed Action lies on the western edge of the Atlantic Flyway. Although there is considerable variation, most birds fly below 500 ft AGL except during migration. Spring migration peaks in March-May, and in September-November during the fall. During these months, there is a higher risk of bird-aircraft strikes at low altitudes ranging from 100 ft AGL to 500 ft AGL. During non-migration months, there still exists a moderate to high risk of bird-aircraft strikes due to the presence of non-migratory species using the forests and airspace of the proposed Duke Low MOA (USAF 2019b). The Avian Hazard Advisory System (AHAS) classifies the risk of bird-aircraft strikes in the current Duke MOA as low to moderate during peak spring and fall migration months (USAF 2015).

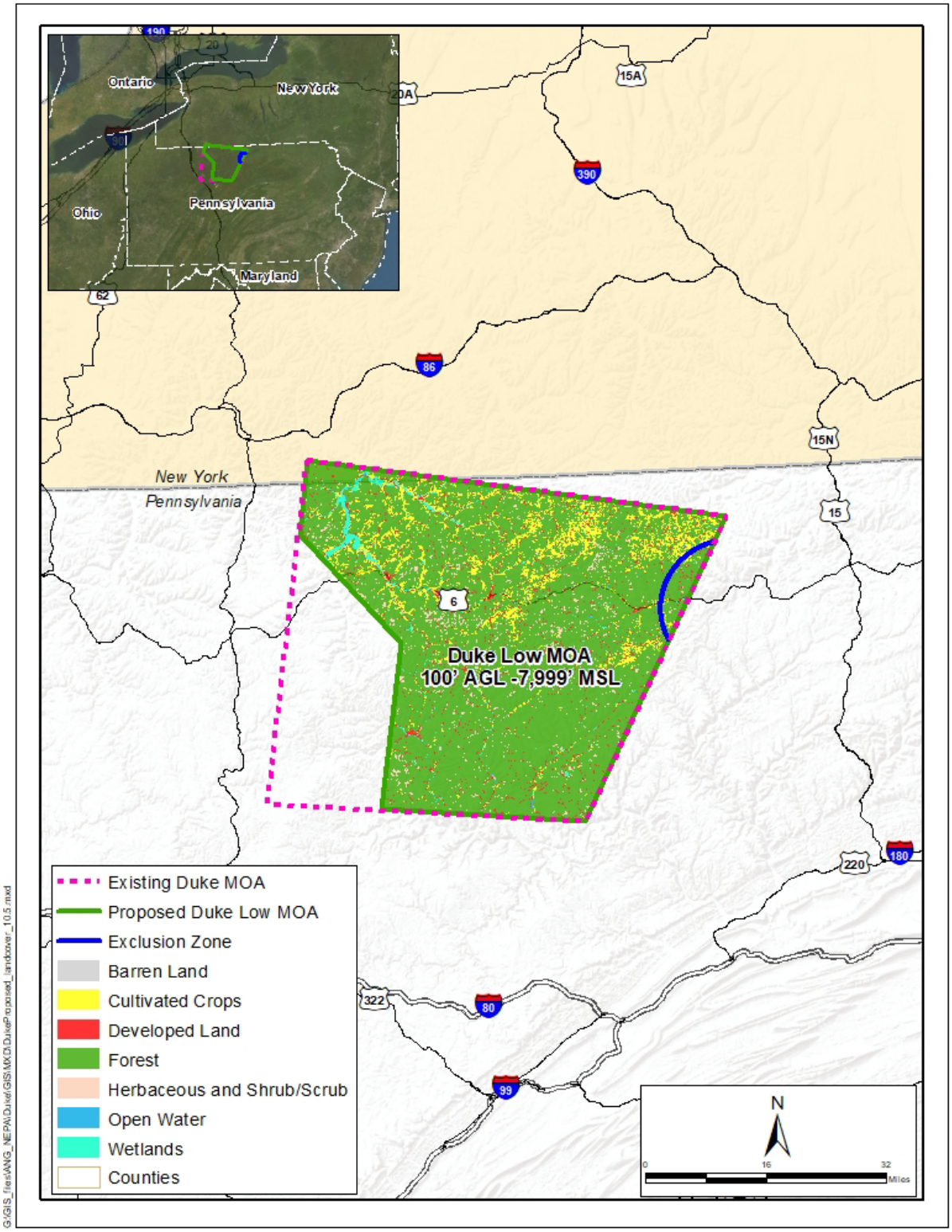
The process for using airspace in the Duke MOA includes a daily briefing by the special operations force's airspace planner for each scheduled flying period. All pilots on the flying schedule will attend this briefing. The briefing will cover local and target area weather, bird conditions, current NOTAMs, a review of pilot currency requirements, special interest items, a review of the emergency procedure-of-the-day, and a review of any significant operational factors affecting the schedule. The notes/restrictions for bird watch conditions are listed below.

- Low: Normal operations
- Moderate: To the maximum extent possible, all operations in range/training area/low-level flights will avoid bird hazard areas and should be above 1,500 AGL when practical.
- Severe: To the maximum extent possible, all operations in range/training area/low-level flights will avoid bird hazard areas and should be above 2,500 AGL when practical.



Source: PA DCNR 2022c

Figure 3-15. State Forest Beneath the Proposed Duke MOA



Source: NLCD https://www.mrlc.gov/

Figure 3-16. Land Cover Types Beneath the Proposed Duke MOA

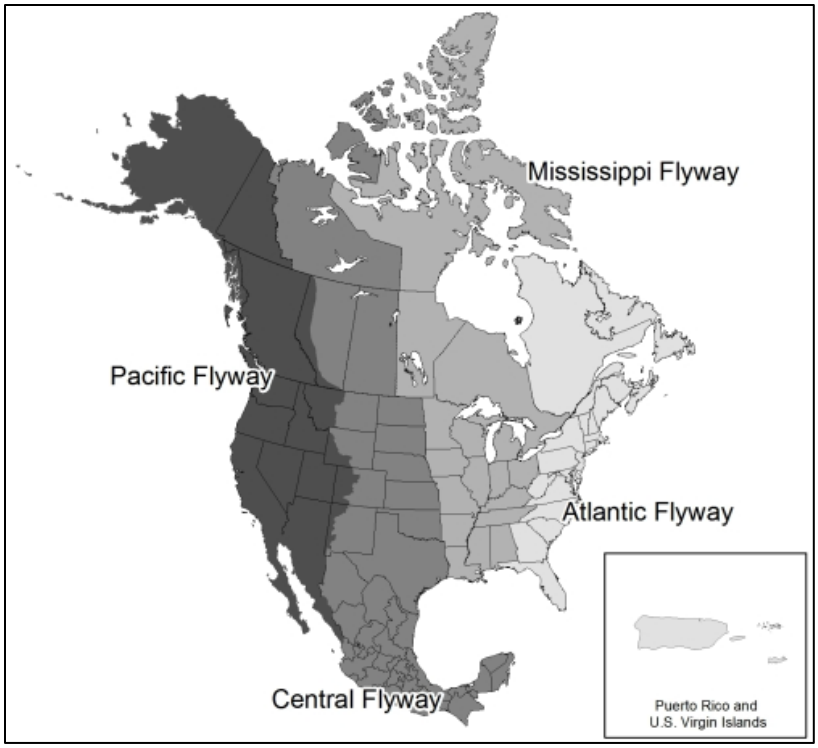


Figure 3-17. Migratory Flyways Over the U.S.

Pennsylvania's elk population is a valuable public resource available for the enjoyment and benefit of all people (Banfield and Rosenberry 2020). In 1913 the Pennsylvania Game Commission began reintroducing elk to Pennsylvania. Over the past 20 years, the Pennsylvania public has embraced the existence of their elk population and elk are valued as a source of recreation by hunters and non-hunters alike. Management goals focus on the long-term sustainability of elk in Pennsylvania, which includes annual hunting during the rutting period in September and October. Pennsylvania's elk management area (**Figure 3-18**) covers approximately 3,757 square miles and encompasses all of Cameron County and portions of Elk, Clinton, Potter, Clearfield, Tioga, Jefferson, Lycoming, and McKean counties. Pennsylvania's elk management area is beneath a significant portion of the proposed Duke Low MOA.

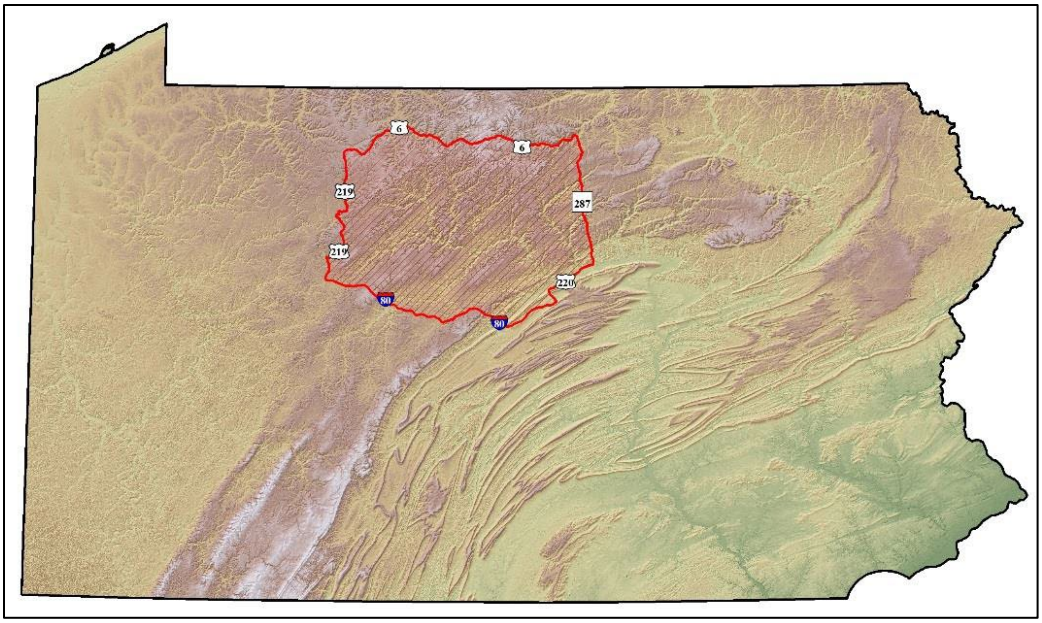


Figure 3-18. Map of Pennsylvania's Elk Management Area, 2006-Present

3.4.2.3 Threatened and Endangered Species

The known or expected range of federally listed threatened and endangered species in the area underlying the proposed Duke Low MOA includes animal species and one plant species. The animals include two bat species, the Indiana bat and the Northern Long-eared bat, as well as two mussel species. There are no federally listed large mammals or birds under the proposed Duke Low MOA (USFWS 2019b). Bat species are described in further detail at the end of this section. Mussel species are not discussed in detail as the Proposed Action would have no effect on them. No critical habitats have been determined to exist in the area beneath the proposed Duke Low MOA. This data was obtained from the USFWS Information for Planning and Consultation (IPaC) tool.

There are 16 migratory bird species known or expected to occur in the area underlying the proposed Duke Low MOA. These species are protected under the Migratory Bird Treaty Act (MBTA). Many of these species are passerines/near passerines (perching birds), with the rest being non-passerines and raptors such as the Bald Eagle, Golden Eagle, and Northern Saw-whet Owl (USFWS 2019b). The Armed Forces are exempt from the incidental take of migratory birds during authorized military readiness activities under the National Defense Authorization Act for Fiscal Year 2003 (Public Law 107-314, 116 Stat. 2458). Furthermore, in accordance with 50 CFR 21.15, the Armed Forces may take migratory birds incidental to military readiness activities provided that the Armed Forces confer and cooperate with the USFWS to develop and implement appropriate conservation measures for any activities that may result in a significant adverse effect on a population of a migratory bird species. Bald Eagles are no longer protected under the ESA and Section 7 consultation with the USFWS is no longer necessary. However, the Bald Eagle remains protected under the Bald and Golden Eagle Protection Act (BGEPA). There are seven bald eagle nesting

sites with 15 active nests beneath the proposed Duke Low MOA. The bald eagle nest information is from the Pennsylvania Bald Eagle Nesting Site Map which was last updated on January 3, 2022. The nesting sites were identified using historical data, aerial surveys and field observations during the 2015 to 2021 nesting seasons (USFWS 2022b). The breeding seasons for species known or likely to occur within the proposed Duke Low MOA, which are protected under the species the MBTA and BGEPA, are listed in **Table 3-12**.

Table 3-12: Species Protected under the MBTA and BGEPA and their Breeding Seasons

Common Name	Scientific Name	Breeding Season
Bald eagle	*Haliaeetus leucocephalus*	September 1 to August 31
Black-billed Cuckoo	*Coccyzus erythropthalmus*	May 15 to October 10
Black-capped Chickadee	*Poecile atricapillus practicus*	April 10 to July 31
Bobolink	*Dolichonyx oryzivorus*	May 20 to July 31
Canada Warbler	*Cardellina canadensis*	May 20 to August 10
Cerulean Warbler	*Dendroica cerulea*	April 27 to July 20
Eastern Whip-poor-will	*Antrostomus vociferus*	May 1 to August 20
Golden Eagle	*Aquila chrysaetos*	Breeds elsewhere
Golden-winged Warbler	*Vermivora chrysoptera*	May 1 to July 20
Henslow's Sparrow	*Ammodramus henslowii*	May 1 to August 31
Kentucky Warbler	*Oporornis formosus*	April 20 to August 20
Northern Saw-whet Owl	*Aegolius acadicus*	March 1 to July 31
Prairie Warbler	*Dendroica discolor*	May 1 to July 31
Red-headed Woodpecker	*Melanerpes erythrocephalus*	May 10 to September 10
Rusty Blackbird	*Euphagus carolinus*	Breeds elsewhere
Wood Thrush	*Hylocichla mustelina*	May 10 to August 31

Source: U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) tool

The Pennsylvania Game Commission lists 29 mammal and bird species as threatened or endangered in the Commonwealth of Pennsylvania (PGC 2021). The New York Department of Environmental Conservation lists 19 species as threatened or endangered (NYDEC 2019). Mammals include three species of bat, two species of shrew, one rat species, and one squirrel species. Bird species include both terrestrial and aquatic birds. A list of federally and state listed species is presented in **Table 3-13**.

Table 3-13. Federal and State Listed Threatened and Endangered Species

Common Name	Scientific Name	Federal Status	PA Status	NY Status
Allegheny Woodrat	*Neotoma magister*		T	
American Bittern	*Botaurus lentiginosus*		E	
Bald Eagle	*Haliaeetus leucocephalus*			T
Black Rail	*Laterallus jamaicensis*			E
Black Tern	*Childonias niger*		E	E
Black-crowned Night Heron	*Nycticorax*		E	
Blackpoll Warbler	*Setophaga striata*		E	
Common Tern	*Sterna hirundo*		E	T

Common Name	Scientific Name	Federal Status	PA Status	NY Status
Dickcissel	*Spiza americana*		E	
Great Egret	*Adrea alba*		E	
Henslow's Sparrow	*Ammodramus henslowii*			T
Indiana bat	*Myotis sodalis*	E	E	E
King Rail	*Rallus elegans*		E	T
Least Bittern	*Ixobrychus exilis*		E	T
Least Shrew	*Cryptotis parva*		E	
Least Tern	*Sterna antillarum*			T
Little Brown Bat	*Myotis lucifugus*		E	
Loggerhead Shrike	*Lanius ludovicianus*		E	T
Long-eared Owl	*Asio otis*		T	
Northern Flying Squirrel	*Glaucomys sabrinus macrotis*		E	
Northern Goshawk	*Accipiter gentilis*		E	
Northern Harrier	*Circus cyaneus*		T	T
Northern Long-eared bat	*Myotis septentrionalis*	T	E	T
Pied-billed Grebe	*Podilymbus podiceps*			T
Piping Plover	*Charadrius melodus*		E	
Red Knot	*Calidris canutus*		T	T
Sedge Wren	*Cistothorus platensis*		E	T
Short-eared Owl	*Asio flammeus*		E	E
Small-footed Bat	*Myotis leibii*		T	
Spruce Grouse	*Falcipennis canadensis*			E
Tri-Colored Bat	*Perimyotis subflavus*		E	
Upland Sandpiper	*Bartramia longicauda*		E	T
West Virginia Water Shrew	*Sorex palustris punctulatus*		T	
Yellow-bellied Flycatcher	*Empidonax flaviventris*		E	
Yellow-crowned Night-Heron	*Nyctanassa violacea*		E	

Notes: E= Endangered, T-Threatened

Source: U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) tool

A brief description of federal and state listed species follows:

Indiana Bat – The Indiana bat was listed as federally endangered in 1973 due to disturbance of their hibernation habitats and loss of their summer habitats. These bats hibernate in large numbers in few caves (20,000-50,000 bats per cave), leaving their population vulnerable to disturbance from even a single event. Almost half of all Indiana bats hibernate in southern Indiana with the rest of the population spread out over the eastern half of the U.S. Females give birth to a single pup in the spring. In the summer, Indiana bats migrate to wooded areas to roost under the peeling bark of dead and dying trees in groups of 100 or more (USFWS 2018).

Northern Goshawk – The Northern Goshawk is listed by the Pennsylvania Game Commission as endangered. The range in Pennsylvania has decreased over the last 20 years. In the 1980s, there

was a stable population in the state of 150-200 territories but dropped to 10-13 annually occupied territories from 2017-2019, and to two territories in 2021 (PGC 2022). Threats to the species include habitat loss and degradation, disease, disturbance near nests, predation and prey availability, and climate change. They nest in a variety of tree species within a territory and may use the same nest for consecutive years. Nesting occurs in April and May.

Northern Long-eared Bat – The Northern Long-eared bat was federally listed as threatened in 2015 primarily due to white-nose syndrome. However, other factors such as hibernation disturbance and summer habitat loss are also possible causes. During the winter, these bats hibernate in caves and mines with constant temperatures, high humidity, and no air currents. In the summer they roost in cavities or crevices of both live and dead trees. The Northern Long-eared bat has a wide range including much of the eastern and north central U.S., and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia (USFWS 2019c).

Little Brown Bat – The little brown bat is listed by the Pennsylvania Game Commission as endangered. The range of these bats is wide and extends from Alaska and central Canada into the southeastern and southwestern U.S. They roost in a variety of habitats containing trees, caves, and rocks. The primary threat to the little brown bat is white-nose syndrome, a disease that threatens a number of bat species. Other threats include loss of habitat and hibernacula due to deforestation and human disturbance (USFWS 2019a). The USFWS is currently conducting a discretionary review of the species. The proposed timeframe provided in the USFWS National Listing Workplan is 2023 to propose listing, make the species a candidate for listing, provide notice of a not warranted candidate assessment, or other action as appropriate.

Tricolored Bat – The tricolored bat is listed by the Pennsylvania Game Commission as endangered. These bats can be found throughout forests of the eastern U.S., roosting mainly in trees. The primary threat to the tricolored bat is white-nose syndrome. However, habitat loss and disturbance are contributing factors to their population decline (USFWS 2017). The USFWS initiated a status review in December 2017 based on a 2016 petition to the Secretary of Interior for listing as threatened or endangered from the Center for Biological Diversity and Defenders of Wildlife. No determination for listing by the USFWS has been made from the status review.

Small-footed Bat – The small-footed bat is listed as threatened by the Pennsylvania Game Commission. These bats can be found in forests of the eastern U.S. with the largest populations being in Pennsylvania, New York, Virginia, and West Virginia. During the summer, small-footed bats typically roost in trees, while in the winter they hibernate in caves and mines. The most prominent threat to these bats is the destruction and disturbance of their habitat sites (PGC 2019a).

Most of the listed bird species are shorebirds or wading birds and are more commonly found in areas with marshes and open water. The landscape beneath the proposed Duke Low MOA is mostly mountainous forest. Five of the bird species are passerines (songbirds/perching birds). These species are found in forests but are likely to stay lower to the ground while foraging/hunting for

food. Five species of raptors are also known or likely to occur, and all are commonly found in forests, grasslands, and wetlands (PGC 2019b).

3.4.3 Significance Criteria

Under the Proposed Action, Effects on biological resources would be considered significant if it would reduce the distribution or viability of threatened or endangered species. Significance of potential impacts to biological resources is determined by the Pennsylvania Fish and Boat Commission as authorized by Section 2305 of the Fish and Boat Code; New York Department of Environmental Conservation Endangered and Threatened Species Regulations as authorized by 6 New York State Codes, Rules and Regulations Part 182, the ESA (16 U.S.C. §§1531-1544, as amended); the MBTA (16 U.S.C. §§703-712 as amended); and the BGEPA (16 U.S.C §§668-668c, as amended).

The state regulations protect and manage threatened and endangered animal species listed by prohibiting the "catching, taking, killing, importation, introduction, transportation, removal, possession, selling, and offering for sale or purchasing of threatened and endangered species" unless permitted to do so by the Executive Director (Steiner 2019, NYDEC 2019). The ESA specifies that effects to biological resources would be considered significant if the Proposed Action would jeopardize the continued existence of a federally listed threatened or endangered species. The MBTA provides that it is unlawful to take any migratory bird (50 CFR 10.13), or any part, nest, egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior. Take is defined in regulations as: pursue, hunt, shoot, wound, trap, kill, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect. The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles (pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb), including their parts, nests, or eggs. Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, or (3) nest abandonment.

3.4.4 Environmental Consequences of the Proposed Action

The Proposed Action would not result in significant impacts to biological resources. Based on the findings in the noise study, the Proposed Action would not impact the distribution or viability of species or habitats of concern; jeopardize the continued existence of a federally listed threatened or endangered species; or result in the destruction or adverse modification of federally designated critical habitat. Approximately 95 percent of the aircraft operation under the Proposed Action would be conducted above 1,000 ft AGL. As such, impacts associated with the visual presence of low-level overflights are not expected to be significant.

Existing studies on the effects of noise on wild and domestic species have found that the type of noise, the duration and the source of the noise, and that aircraft overflight under most circumstances has minimal biological significance on unconfined wildlife and domestic animals

(e.g. Manci et al. 1988; Ellis et al. 1991; Radle 2007; NPS 2011; Shannon et al. 2016). Short term, indirect effects could result from noise associated with aircraft overflights. However, the Proposed Action would not introduce a consistent noise source. These effects would cease and return to existing conditions when aircraft are not periodically flying overhead. Long-term effects would be similar in nature and overall level as the short-term effects. The Proposed Action would not be expected to impact Pennsylvania's elk herd because the frequency of overflights below 1,000 ft AGL would be extremely limited (e.g., seconds to minutes per year).

As discussed under **Section 3.4.3,** the BGEPA of 1940 (16 USC §§ 668–668c) Injury to Bald and Golden Eagles, decreases in nesting productivity, or nest abandonment, as described in the BGEPA, are not anticipated.

3.4.4.1 Noise Effects on Wildlife

Noise effects on wildlife can be classified as hearing, masking, physiological, or behavioral (Dufour 1980, Shannon et al. 2016). Wildlife could habituate to repeated exposure to aircraft noise; however, habituation (i.e., the diminishing of a physiological or emotional response to a frequently repeated stimulus) seems unlikely given the widely dispersed nature of aircraft operations and the infrequency of the activities proposed in the Duke Low MOA. The effect of external noise on wildlife is of greater concern for continuous and near continuous noise sources (e.g., generators, airports, highways) than for intermittent brief noise exposures such as military jet overflights (Manci et al. 1988). The potential noise impacts on wildlife from such events would be limited to startle (behavioral) responses to the sporadic noise events with a subsequent return to normal behavior (Dufour 1980). Such reactions have been especially noticed with low-level rotary wing aircraft flights. Manci et al. (1988) found that sound levels above 90 dB may impact mammals and may be associated with a number of behaviors such as retreat from the sound source, freezing, or a strong startle response. Escape behavior would represent a strong startle response, but it is rarely observed in response to overflights above 500 ft AGL (Bowles 1994; Dufour 1980).

Ungulates

Studies have been conducted to evaluate the impact of aircraft noise and sudden visual appearance of aircraft on wildlife (Dufour 1980; Manci et al. 1988; Ellis et al. 1991). Studies of the noise effects on wildlife have resulted in a wide range of behavioral response ranging from immediate fright response to no visible reaction. Species appear to be influenced more by sight than by sound of low-flying jet aircraft. Bowles (1995) notes that wildlife react to visual stimuli (e.g., aircraft overflights) that are below 1,000 ft AGL.

No changes in behavior were found in Sonoran pronghorn directly exposed to military overflights (Krausman and Harris 2002, Krausman et al. 2004). Overflights of A-10 and F-16 military aircraft had marginal influence on Sonoran pronghorn behavior. The Sonoran pronghorn behavioral patterns were similar with and without the military aircraft stimuli and the exposed animals had similar behavior to pronghorn not exposed to regular military activity (Krausman et al. 2004).

Studies evaluating the effects on behavior and heart rate of captive mule deer and mountain sheep exposed to simulated low-altitude jet noise found that changes in heart rate during overflights returned to pre-disturbance conditions within 60-180 seconds (Weisenberger et al. 1996). Changes in behavior from simulated jet noise were also observed but returned to pre-disturbance conditions in less than five minutes. Wild mountain sheep exposed to F-16 overflights exhibited similar heart elevations in 21 out of 149 overflights with heart rates returning to pre-overflight levels within 120 seconds (Krausman et al. 1998). No changes in the use of habitat or behavior were observed in the wild mountain sheep.

Studies on ungulates (e.g., elk, pronghorn, bighorn sheep, and mule deer) show that disturbances from subsonic aircraft noise are transient and short in duration which suggests that they habituate to the sounds. In a heavily used MOA in Alaskan caribou, military jet overflights did not cause mortality of caribou calves or result in increased movement of cow-calf pairs over the 24- hour period following exposure to overflights (Lawler et al. 2005, Magoun et al. 2003). Observations of caribou in Alaska exposed to fixed-wing aircraft and helicopters showed running and panic reactions occurred when overflights were at an altitude of 200 feet or less. The reactions decreased with increased altitude of overflights, and, with more than 500 feet in altitude, the panic reactions stopped (Lawler et al. 2005). Caribou exhibited mild short-term responses compared to reactions to predators. At altitudes of 200 ft or less, caribou ran and panicked when fixed-wing aircraft approached, and reactions decreased as flight altitudes increased; above 500 ft panic responses were not observed (Klein 1973).

Effects of the Proposed Action on Pennsylvania's elk herd would not be considered significant because the frequency of overflights below 1,000 ft AGL at any given point would be extremely limited (e.g., seconds to minutes per year). Based on the sporadic and infrequent change in sound level from baseline and the predicted wildlife startle response; temporary behavioral effects, and lack of reported impacts on reproduction, mortality, or survivorship, the Proposed Action would not result in significant effects to biological resources (Dufour 1980; Manci et al. 1988; Smith et al. 1988; Ellis et al. 1991; Weisenberger et al. 1996; Grubb & Bowerman 1997; Krausman et al. 1998, Krausman & Harris 2002; Krausman et al. 2004; Lawler et al. 2005.).

Birds

Studies have shown that birds are particularly susceptible to noise disturbance when exposed to repeated aircraft overflights (Manci et al. 1988, Ellis et al. 1991). While such responses have been observed, little information is available on indirect or long-term effects on the vigor or survivability of wildlife populations due to overflight noise compared to other environmental factors. Ellis et al. (1991) examined behavioral and reproductive effects of several raptor species to low-level flight. They found no incidents of reproductive failure and that site re-occupancy rates were high the following year.

Several studies have found that impacts to raptors and other birds (e.g., waterfowl, grebes) from low-level aircraft flights were brief and not detrimental to reproductive success (Smith et al. 1988;

Ellis et al. 1991; Grubb & Bowerman 1997). Johnson and Reynolds (2002) reported that Mexican spotted owls exhibited little to no response to F-16 aircraft flying at low altitudes. Behaviors of owls during 25-second fly-by periods ranged from "no response" (no body movements) to "intermediate response" (sudden turning of head). Bowels et al. (2003) also found that Mexican spotted owls do not exhibit escape flights from roost groves or nests after exposure to military jet aircraft.

In a literature review of raptor responses to aircraft noise, Manci et al. (1988) found that most raptors did not show a negative response to overflights. When negative responses were observed, they were predominantly associated with rotor-winged aircraft or jet aircraft that were repeatedly passing within 0.5 miles of a nest. Effects reported in noise-wildlife studies were temporary with no acute (i.e., sudden) effects on reproduction, mortality, or survivorship. Ellis et al. (1991) performed a study to estimate the effects of low-level military jet aircraft and mid- to high altitude sonic booms (both actual and simulated) on nesting peregrine falcons and seven other raptors (common black hawk, Harris' hawk, zone-tailed hawk, red-tailed hawk, golden eagle, prairie falcon, bald eagle). The study found that the impact of frequent low-level jet overflights on nesting peregrine and prairie falcons were minimal and not associated with reproductive failure; a few seconds after an overflight the birds quickly resumed their normal activities. Re-occupancy and productivity rates were within or above expected values for self-sustaining populations. Under the Proposed Action, aircraft would maintain a 1,000 ft overflight buffer and a 0.5 NM lateral buffer around Bald Eagle nests beneath the proposed Duke Low MOA, in accordance with recommendations from USFWS (**Appendix A**). Additionally, the ANG Eastern Area Defense Sector would coordinate with PA and NY USFWS Ecological Services Field Offices for consistency with bald eagle management guidelines and conservation measures (USFWS 2007).

Noise-related effects on birds involve the masking of communications among members of the same species, reducing the detectability of biologically relevant signals including the sounds of predators and prey, and temporarily or permanently decreasing hearing sensitivity (Dooling & Popper 2007). Birds typically hear a narrower frequency bandwidth compared to humans (Dooling & Popper 2007). A study of captive zebra finches (*Taeniopygia guttata*) given a choice of foraging in noisy and quiet area found no significant difference in the amount of time birds spent in noisy and quiet areas though those foraging in noisy areas spent more time being vigilant, resulting in less efficient foraging than those in quiet areas (Evans et al. 2018). In a study of ovenbirds, Habib et al. (2007) found chronic noise exposure near compressor stations affected pairing success, attributable by masking and distorting the song of breeding males on territories. In birds, hearing loss is difficult to characterize since birds regenerate hair cells even after substantial losses that can result in temporary threshold shifts (Bowles 1995). The Proposed Action would not reduce the distribution or viability of species or habitats of concern.

3.4.4.2 Noise Effects on Domestic Animals

. The effects of aircraft noise on domestic animals indicates that they exhibit some behavioral responses to military overflights but generally seem to habituate to the disturbances over a period of time. Many studies on domestic animals suggest that some species appear to acclimate to sound disturbance (Manci et al. 1988). The effects of noise on domestic animals have been studied since the late 1950's and based on these studies, the effects from conducting low-altitude flights over agricultural areas would be small (Bowles et al. 1990). Noise generated by low-altitude, high-speed aircraft overflights typically have no direct effect on large domestic livestock (USAF 1994).

In a technical bulletin, the Department of Defense Noise Working Group published a summary of an extensive body of pertinent scientific data on domestic fowl accumulated over the past 40 years. The technical bulletin concluded that the most serious potential damages to poultry are injuries and suffocations that occur when panicked birds pile or crowd. It was noted that any type of aircraft noise of sufficient sound level can induce piling and crowding; however, only naive birds (with no prior exposure to aircraft noise) panic, and birds habituate quickly to noise. The technical bulletin noted that the likelihood of damaging panicked responses is small based on experimental studies and interviews with growers. Based on the existing experimental evidence, effects on productivity (effects on growth and egg production) were considered unlikely and predictions of the potential for effect could not be made because little is known about the physiological effects of stress, in general, on birds. The summary noted that effects of aircraft overflights on marketability are possible; however, the economic losses due to aircraft overflights would be minimal (DNWG 2013). More severe responses are possible depending on the number of birds, the frequency of exposure, and environmental conditions (Wyle Laboratories 2008). Given the volume of the proposed Duke Low MOA airspace, no single location would be subjected to repeated or continuous overflights. Based on the findings in the studies on the effects of aircraft noise on domestic animals and livestock, the potential for noise disturbance from aircraft operations under the Proposed Action would not be considered significant.

3.4.4.3 Threatened and Endangered Species

The Proposed Action would not result in significant effects on the federal and state listed species known or expected to occur under the proposed Duke Low MOA. Due to the fact that no infrastructure changes, no ground-disturbing activities, no supersonic flight activities, no release of chaff and flare, no weapons firing, and no ordnance deployment would occur, no effects to ground-dwelling wildlife (i.e., shrews, reptiles, amphibians, fish, and invertebrates) or their associated habitats would result from implementation of the Proposed Action. Water resources (i.e., wetlands, floodplains, surface waters, groundwater, or wild and scenic rivers) were also dismissed from detailed analysis for the same reason.

Bat species found within the ROI spend the majority of their lives in caves or forests. As bats are nocturnal, they would be less likely to be impacted as the aircraft operations would occur during

daytime hours. Existing nighttime training activities in the Duke MOA would continue to be limited to above 1,000 ft AGL under the Proposed Action. The Proposed Action is within the known range of northern long-eared bat (all counties under the proposed airspace) and the Indiana bat (specifically Clinton County). According to the USFWS, the southern portion of Clinton County is within 0.25 miles of a known northern long-eared bat hibernaculum. In addition, McKean, Potter, Tioga, Elk, and Clinton counties contain known, occupied maternity roost trees throughout the counties. While no ground disturbance would occur under the Proposed Action; potential impacts from ground vibrations associated with airspace use at 100 ft AGL and above could occur.

Under the Proposed Action, there could be a limited number of overflights that occur at night when many bat species are active. Some species of bat migrate or hunt at altitudes of 1,100 ft AGL, however based on the behavior of migrating bats, it is likely that they are flying just above treetop level. In addition, bats stop to forage throughout the night, indicating that they are likely flying low enough detect areas for feeding, drinking, and roosting (Peurach 2009; Roby 2019). Northern long-eared bats primarily fly through the understory of forested areas while hunting make short migrations to their winter hibernacula (USFWS 2022a). A study that looked at 147 recorded bat strikes, in which the pilots reported awareness of the strikes, concluded that the average altitude of bat-aircraft strike occurrence is approximately 1,100 ft AGL (Peurach 2009). Given that aircraft would spend approximately 10 minutes or less below 1,000 ft AGL during each sortie, and nighttime operations would not occur below 1,000 ft AGL, the potential for bat-aircraft strikes is negligible.

Few studies exist on the effects of sound on Indiana Bats. Many of the existing studies have concentrated on documenting the response of hibernating Indiana Bats to sound. Data on Indiana Bat response to military sound was limited in the 3D/Environmental (1997) study that found hibernating Indiana Bats and Little Brown Bats did not appear to respond to intense sound simulations (recordings of actual military activities played over a loudspeaker system). Dalton and Dalton (1993) investigated the effects of low-level (500 ft AGL) military jet flights on the lesser long-nosed bat in a mine that served as a day roost at Organ Pipe Cactus National Monument. Bats exposed to low-level flights exhibited no acute responses (panic flights, falling young bats, or startle responses). No significant differences in bat orienting responses were noted before, during, or after jet flights, but depressed levels of bat flights were noted for up to 30 minutes following the jet noise. Low-level jet noise attenuated rapidly within the roost, particularly the high frequency sounds to which bats are particularly sensitive.

Combined with the vast distribution of aircraft within the proposed Duke Low MOA and the limited amount of time at these altitudes, the time an aircraft was “overhead” at any given point on the ground would be extremely limited (e.g., seconds to minutes per year). In their study of low-altitude aircraft activity near the runway of an international airport, Le Roux and Waas (2012) found no statistically significant difference in mean bat activity during and after overflights compared with pre-aircraft activity. They concluded that both correlative and experimental data

suggests that aircraft activity and noise may not have major impacts on bat activity. Studies indicate that sound pressure level decreases rapidly with increasing distance from the source when dispersed through a forest canopy. Noise attenuation, or absorption, is highest at the ground level, though the tree canopy also provides noise attenuation (Heisler & Herrington, 1977). Therefore, potential impacts to bats associated with low altitude overflights produced under the Proposed Action would not be considered significant.

The existing and proposed airspace areas are located within the Atlantic Flyway; therefore, the greatest potential for bird strikes under existing and proposed conditions would occur during spring and fall migrations, when the number of birds in the air column increases and birds are typically flying at higher altitudes.

In response to concerns raised by PA DCNR regarding potential noise impacts to sensitive species, the NGB raised the floor to 500 ft AGL over state parks and undeveloped areas that are considered noise sensitive. These areas include Denton Hill, Lyman Run, Patterson, Prouty Place, Cherry Springs, Sinnemahoning, Ole Bull, and Sizerville state parks. The airspace floor would also be raised to 500 ft AGL over Johnson Run Natural Area, Pine Tree Trail Natural Area, Bucktail State Park Natural Area, Tamarack Swamp Natural Area, and Square Timber/Big Run Wild Area. In addition, the floor of the MOA would be raised to 1,000 ft AGL over the Forrest H. Dutlinger Natural Area, Hammersley Wild Area, and Kettle Creek State Park in an effort to minimize potential impacts to those wild and recreational areas. Based on the sporadic and infrequent change in sound level from baseline and the predicted wildlife startle response, significant impacts to threatened and endangered species as a result of noise disturbance from aircraft operations are not anticipated (Dufour 1980; Manci et al. 1988; Ellis et al. 1991).

3.4.5 No Action Alternative

Selecting the No Action Alternative would result in no additional effects on biological resources. The modification of the Duke MOA would not occur. The noise environment and existing habitat would remain unchanged when compared to existing conditions.

3.5 CULTURAL RESOURCES

3.5.1 Definition of Resource

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and Executive Orders. Cultural Resources include the following subcategories:

- Archaeological (i.e., prehistoric or historic sites where human activity has left physical evidence of that activity, but no structures remain standing);

- Architectural (i.e., buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance); and
- Traditional Cultural Properties (TCPs - resources of traditional, religious, or cultural significance to Native American tribes and other communities).

The NRHP is a listing maintained by the federal government of prehistoric, historic, and cultural buildings, structures, sites, districts, and objects that are considered significant at a national, state, or local level. Listed resources can have significance in the areas of history, archaeology, architecture, engineering, or culture. Cultural resources listed in the NRHP, or determined eligible for listing, have been documented and evaluated according to uniform standards, found in 36 CFR 60.4, and have been found to meet criteria of significance and integrity. Cultural resources that meet the criteria for listing on the NRHP, regardless of age, are called *historic properties*. Resources that have undetermined NRHP eligibility are treated as historic properties until a determination otherwise is made.

Federal laws protecting cultural resources include the Archaeological and Historic Preservation Act of 1960 as amended, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and the NHPA, as amended through 2016, and associated regulations (36 CFR 800). The NHPA requires federal agencies to consider effects of federal undertakings on historic properties prior to making a decision or taking an action and to integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the Section 106 consultation process, as set forth in 36 CFR Part 800. Section 106 of the NHPA requires federal agencies to consider the effect of their undertakings on historic properties. The ACHP regulations that implement Section 106 (36 CFR Part 800) describe the process for identifying and evaluating historic properties; assessing effects of federal actions on historic properties; and consulting to avoid, minimize, or mitigate any adverse effects.

Section 106 of the NHPA requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects on historic properties (36 CFR 800.1[a]). For cultural resource analysis, the Area of Potential Effects (APE) is used as the ROI. APE is defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist," (36 CFR 800.16[d]) and thereby diminish their historic integrity. The APE for this EA includes all the lands under the proposed Duke Low MOA.

As a federal agency, the DAF and the NGB have a responsibility to consult with federally recognized tribes on a government-to-government basis in accordance with DAFI 90-2002. Section 101(d)(6) of the NHPA mandates that federal agencies consult with Tribes and other Native American groups who either historically occupied the project area or may attach religious or cultural significance to historic properties in the region.

3.5.2 Affected Environment

3.5.2.1 Cultural and Historical Setting

The following summary provides a broad overview of the cultural history of the APE and is taken from the EReferenceDesk (2019a and 2019b). The first known inhabitants in the region were the Paleo-Indians, early hunters and gatherers who arrived sometime before 11,000 BC. Around this time, glaciers made for long, hard winters and short, cool summers. In the Appalachian region, the mountain slopes were bare and tundra-like. The first people lived in small family units or bands. These extended families moved seasonally throughout a broad territory to hunt and forage, taking advantage of resources such as game and plants during particular seasons. The bands hunted mega-fauna, such as mastodons, mammoths, and buffalo, as well as large game, such as caribou, elk, moose, and deer, with spears that had fluted projectile points. These stone points, along with other stone tools such as scrapers, gravers, perforators, wedges, and knives, have been found throughout Pennsylvania, especially along major rivers and streams. These tools were used to spear game, cut meat, scrape and cut hides, and split and carve bone.

Starting around 8,000 BC, the cold, moist climate of the Pleistocene age began to change to a warmer, drier one. Glaciers melted, sea levels rose, and the ocean became warmer. Over the following 7,000 years, known as the Early and Middle Archaic periods, in habitants of the region incorporated new adaptations to this new moderate and more inviting environment. During the Early Archaic, populations grew and families lived in larger bands, and though they remained mobile, their territories were limited to smaller, fertile areas. The seasonal movements of the bands were modified so that groups stayed in one area for longer periods of time. In the Middle Archaic, people began producing large quantities of chipped stone axes. With these large axes, people could more easily cut trees and shape wood to build houses and make fires. The resulting forest clearing changed the environment, encouraging the growth of plants and trees that were beneficial to the people, such as berry bushes and fruit and nut trees. In turn, deer, bear, turkey, and other animals came to the clearings to browse on these shrubs and low-lying trees. Other changes included the use of gardens, development of primitive pottery, and harvesting of shellfish from riverine environments. The Late Archaic is marked by the settlement of people into larger villages. People began clearing sections of land with fire to encourage growth of beneficial plants annually.

The transition from the Archaic to the Early Woodland period started after 1,000 BC. During this time period, people organized into more sedentary villages and developed extensive gardens. The Early Woodland is also marked in part by the introduction of ceremonial burial mounds. The dead were left with items of importance. During the Late Woodland (1000 to 1600 BC), the region was occupied by Native Americans of varying tribes. They lived in villages and hunted (now using the bow and arrow), fished, and cultivated corn, beans, and squash.

When Europeans arrived in the 17th century, they found a flourishing population of Native peoples in Pennsylvania. Tribes included the Lenape Delaware, Erie, Honniasont, Iroquois, Saponi,

Shawnee, Susquehanna, Tuscarora, Tutelo, and Wenrohronon. These early groups traveled by canoe or on foot, lived in houses made of bark, used stone and wood tools, and wore clothing made from the skins of animals. Although some farming was done, most food was acquired through hunting and gathering. Some tribes from New York and Pennsylvania formed the Iroquois Confederacy – a powerful alliance of five Iroquois-speaking nations (Mohawk, Oneida, Onondaga, Cayuga, and Seneca). The other large linguistic group in Pennsylvania was the Algonkian, represented by the Delawares, Shawnees, and other tribes. Once the Europeans arrived, the Native peoples found themselves in competition for land and resources. They were also exposed to European diseases for the first time, to which they had no immunity, effectively decimating their populations.

3.5.2.2 National and State Listed Historic Sites

The NRHP was searched to identify historic properties that have been recognized as having historic significance and are located underlying the existing and proposed Duke MOAs (NPS 2019a and 2019b). Those properties listed on the NRHP are shown in **Tables 3-14** and **3-15**. **Figure 3-19** depicts the historic resources under the proposed airspace. There are no properties underlying the existing and proposed Duke MOAs that are designated as National Historic Landmarks (NPS 2019c).

Table 3-14. National Register-Listed Properties in Pennsylvania beneath the Duke MOAs

Status	Historic Property Name	Location
Existing Duke MOA Only (not under the proposed Duke Low MOA)		
Listed	St. Mary's Historic District	St. Mary's, Elk County
Listed	John E. Weidenboerner House	St. Mary's, Elk County
Listed	Decker's Chapel	St. Mary's, Elk County
Both Existing and Proposed Duke MOAs		
Listed	Lynn Hall	Liberty Township, McKean County
Listed	Coudersport Historic District	Coudersport, Potter County
Listed	Potter County Courthouse	Coudersport, Potter County
Listed	Coudersport and Port Alleghany Railroad Station	Coudersport, Potter County
Listed	Cherry Springs Picnic Pavilion	West Branch Township, Potter County
Listed	Austin Dam	Austin, Potter County

Source: NPS 2019a

Table 3-15. National Register-Listed Properties in New York beneath the Duke MOAs

Status	Historic Property Name	Location
Existing Duke MOA Only		
	none	
Both Existing and Proposed Duke MOAs		
Listed	House at 520 Hostageh Road	Rock City, Cattaraugus County
Listed	Ceres School	Ceres, Alleghany County

Source: NPS 2019b

A complete listing of previously recorded cultural resources that are under the existing and proposed Duke MOAs is provided in **Appendix G** (State of Pennsylvania 2020; State of New York 2020). Under the existing Duke MOA there are 642 historic resources that include religious buildings, commercial buildings, houses, farms, bridges, railroad segments, water control features, and historic districts. There are 19 recorded prehistoric and historic archaeological resources, including rockshelters, habitation sites, and farmsteads. The National Register status of these resources is nine listed resources, 24 eligible resources, 234 not eligible or destroyed, 60 unevaluated, and the rest with no available information on status. There are 2,872 historic resources of similar types and 163 archaeological sites under the existing and proposed Duke MOAs. The National Register status of these resources is 11 listed resources, 60 eligible resources, 732 not eligible or destroyed, 2,103 unevaluated, and the rest with no available information on status.

According to Pennsylvania's Historic and Archeological Resource Exchange, the following state parks that fall within the Proposed Duke Low MOA have an "undetermined" eligibility status for listing under NRHP: Cherry Springs, Denton Hill, Kettle Creek, Lyman Run, Ole Bull, and Sinnemahoning (PA-SHARE 2022).

The following state parks: Bendigo, Elk, Hyner Run, Hyner View, Patterson, Prouty Place, and Sizerville; and state forests: Elk, Sproul, Susquehannock, and Tioga do not have eligibility status records.

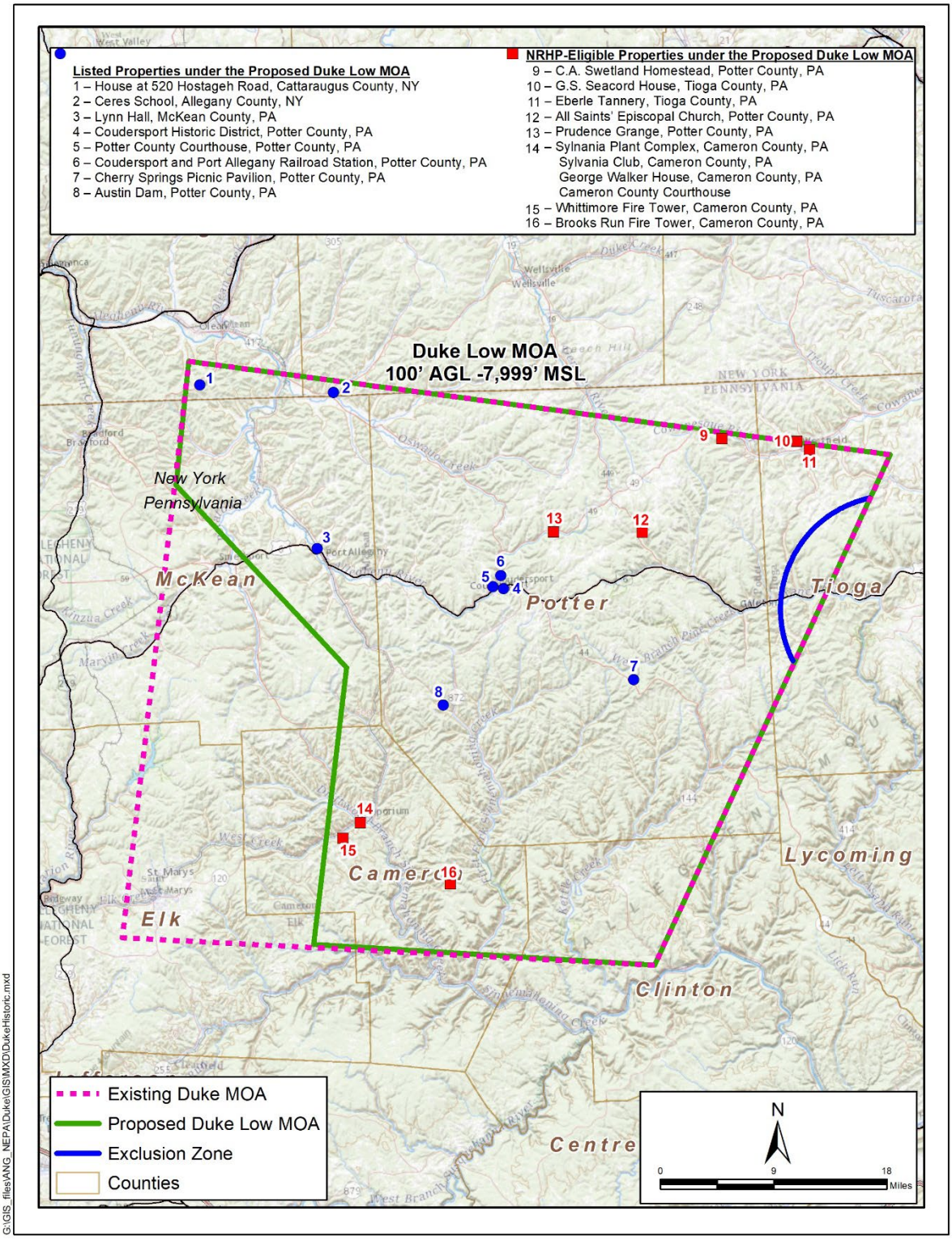


Figure 3-19. Historic Resources under the Proposed Duke Low MOA

3.5.2.3 Tribally-Significant Cultural Resources

No American Indian Reservations or lands set-aside for Native American tribes are beneath the existing or proposed Duke MOAs, and there are no current tribally owned or trust lands beneath the MOAs (USGS 2019a and 2019b). No federally recognized tribes currently reside in Pennsylvania. New York has seven federally recognized tribes, some of which also have interest in Potter County Pennsylvania. The area beneath the existing and proposed Duke MOAs was historically occupied at various times by the Shawnee, Iroquois, and Ohio Valley tribes. Consultation with federally recognized Native American representatives was undertaken to identify land, structures, or resources potentially of concern related to the Proposed Action. One response was received. The Pokagon Band Potawatomi responded to outreach efforts with an acknowledgement letter and requested a copy of the Final EA and signed FONSI once available. **Appendix B***, Tribal Consultation,* summarizes all correspondence between the project proponents and affected Native American Tribes.

- Delaware Nation, Oklahoma
- Delaware Tribe of Indians
- Tonawanda Band of Seneca
- Seneca Nation of Indians
- Seneca-Cayuga Nation

3.5.3 Significance Criteria

Adverse impacts to cultural resources might include physically altering, damaging, or destroying all or part of a resource or altering characteristics of the resource that make it eligible for listing in the NRHP. Those effects can include introducing visual or audible elements that are out of character with the property or its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency ownership (or control) without adequate enforceable restrictions or conditions to ensure preservation of the property's historic significance. Section 106 regulations provide specific criteria for assessing effects on historic properties, including:

- Physical destruction of or damage to all or part of a property;
- Physical alteration of a property;
- Removal of a property from its historic location;
- Change in the character of a property's use or of physical features within a property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or auditory elements that diminish the integrity of a property's significant historic features;
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance; or

- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of a property's historic significance (36 CFR 800.5[a][2]).

For the purposes of this EA, an effect is considered adverse if it alters the integrity or has the potential to adversely affect historic properties.

3.5.4 Environmental Consequences of the Proposed Action

The Proposed Action would introduce additional noise to historic properties located within the APE; however, those effects would not compromise those attributes that make the properties eligible for listing in the NRHP. The Proposed Action would not include construction, demolition, ground disturbance, renovation, infrastructure upgrades, chaff or flares, weapons firing, ordnance deployment, or supersonic aircraft operations. The Proposed Action would not result in noise exposure for an extended period of time in close proximity to historic resources in the APE. In accordance with AFMAN 11-202v3 aircraft would continue to follow low-level guidance and remain 1,000 ft above the highest obstacle and 2,000 ft laterally when over congested or populated areas, as well as 500 ft above all known or observed antennas and obstacles. In addition, avoidance of noise-sensitive areas would be emphasized to all flying units using the Duke MOA (see **Chapter 5**, Management Actions and Special Procedures).

The Pennsylvania State Historic Preservation Officer responded to Section 106 coordination (**Appendix A**) and advised that the proposed project could have the potential to affect historic properties, pending receipt of additional information. In addition, several comments were provided including (1) the Proposed Action should have no effect on archaeological resources, (2) the APE should take into account those areas from which the project may have direct or indirect effects on historic properties, (3) there are numerous state parks and a portion of the Allegheny National Forest in the vicinity that may have significance in the area of recreation/conservation, and (4) the NRHP listed Austin Dam in the APE is categorized as a ruin. To further clarify the components of the Proposed Action, the NGB and the 175 WG prepared a proposed altitudinal mitigation map to address the sensitive area concerns while ensuring the Maryland ANG A-10C training mission. Under the Proposed Action, aircraft would spend approximately 10 minutes or less below 1,000 ft AGL in a given hour of usage during a 2-hour activation window, aircraft operations below 500 ft AGL would occur for 2-3 minutes per activation. The LASDT training down to 100 ft AGL would be only several seconds and less than 0.5 miles overland in the 2-3 minutes of flight in the low altitude ranges. Approximately 95 percent of aircraft operations would be conducted above 1,000 ft AGL. In addition, a 1,000 ft AGL floor or a 500 ft AGL floor would be implemented over sensitive areas of concern in the southern portions of the Duke Low MOA (see **Figure 3-2**).

The natural quiet of historic properties may be one element of its cultural value and aircraft overflights could disrupt this natural quiet. The analysis of the potential impacts of the Proposed Action to historic properties is based on the noise assessment presented in **Section 3.2**. **Figure 3-3** shows background overall sound levels (DNL) without any aircraft activities and select points

of interest for areas below the Duke MOA. The Proposed Action would not increase noise levels by more than 1.5 dBA DNL in a noise sensitive area that is exposed to noise above 65 dBA DNL, or generate individual acoustic events loud enough to damage hearing or structures. In addition, disruptions would be infrequent based on the proposed use of the airspace and would not be expected to affect the way in which most people perceive the area as a whole. These changes in overall noise would be negligible when compared to existing conditions. The Proposed Action would increase overall sound levels (L_{dnmr}) between 0.1 and 1.3 dBA in areas beneath the proposed Duke Low MOA. Although the overall noise environment would not be greatly affected, there would be, on rare occasions, individual overflights that would be loud enough to interfere with speech; however, would not be loud enough to damage structures. These effects would not be considered significant.

No visual impacts on historic resources were identified. Beneath the Duke Low MOA, there would be periodic low overflights loud enough to cause brief interruptions in communication. These overflights would be brief, intermittent, distributed throughout the proposed Duke Low MOA, and would not normally occur repeatedly at any one location. These overflights would be neither loud enough, nor frequent enough, to be incompatible with any land uses or any noise sensitive activities. No settings of existing or potential historic properties would be appreciably affected by increases in noise. Noise from aircraft operations for all historic properties, and all areas under the proposed MOAs, would be well below 65 dBA DNL and would be compatible with all noise sensitive activities. While individual flyover events could be loud at times, due to the infrequency of these events in any one location and short duration of exposure, the settings of historic properties would not be subject to appreciable increases in overall noise level. There would be little degradation of the feeling or atmosphere of historic properties beneath the proposed MOA. Thus, the proposed undertaking would not significantly alter the settings of existing or potential historic properties.

In general, structural damage is possible only for non-impulsive sounds that last more than one second above an unweighted sound level of 130 dB (Committee on Hearing, Bioacoustics and Biomechanics, 1977). Noise at this intensity and duration does not typically occur anywhere except on the flightline immediately adjacent to aircraft. Sonic booms are impulsive sounds that are associated with an increased risk of structural damage at overpressures greater than four pounds per square foot. Supersonic operations over land would not occur under the Proposed Action and would not generate sonic booms of sufficient intensity to pose a risk to structures. Under the Proposed Action, overflights within the Duke Low MOA would not be supersonic and would not generate sonic booms above 140 dB or for an extended period that could cause potential damage to structures. As such, the risk to structures associated with proposed aircraft operations is uniformly minimal and there is no potential for structural damage due to noise.

The primary source of impacts to cultural resources beneath the affected airspace is through sound and vibration. The noise analysis has identified no significant noise impacts associated with the Proposed Action (see **Section 3.2.8** Noise, Environmental Consequences of the Proposed Action).

Noise levels would remain below 65 dB L_{dnmr} throughout the proposed Duke Low MOA. The largest changes in noise levels would occur within the Patterson State Park and Prouty Place State Park, with increases of 1.3 dB L_{dnmr}, but levels would remain below 49 dB L_{dnmr} in these areas. As described above, scientific studies of the effects of noise and vibration on multiple types of historic properties have concluded that overpressures generated by subsonic overflight were well below established damage thresholds (see **Appendix F**). No adverse effects to historic properties under the airspace are expected at these levels. Visual intrusions under the Proposed Action would be minimal and would not represent an increase sufficient to cause adverse effects to the settings of cultural resources since no construction or infrastructure changes would occur and given the low number of annual operations expected.

Under the Proposed Action, overflights within the Duke Low MOA would not be supersonic and would not generate sonic booms above 140 dB or for an extended period that could cause potential damage to structures. Therefore, changes in the overall noise environment and individual overflights would have no adverse effect on historic properties. Proposed operations could occur in the vicinity of the National Register-listed Austin Dam, but the operations would be intermittent and not for any extended period of time. A 500 ft AGL floor over the historical Austin Dam ruins would be implemented to further ensure avoidance of adverse effects to the Austin Dam ruins.

Tribal coordination was done through certified mail to five Tribes; follow-up phone calls to tribal recipients were conducted at 2 weeks and at 2 months after receipt verification to ask if there are any questions or concerns regarding the Proposed Action. The only response to early coordination letters and follow-up calls was from the Delaware Nation, Oklahoma (**Appendix B**). The response stated that the proposed project does not endanger cultural or religious sites of interest to the Delaware Nation.

3.5.5 No Action Alternative

Selecting the No Action Alternative would result in no impacts to cultural resources. The modification to the Duke MOA would not occur. Cultural resources would remain unchanged when compared to existing conditions. Consequently, implementation of the No Action Alternative would have no effect on cultural resources.

3.6 HUMAN HEALTH AND SAFETY

3.6.1 Definition of Resource

The primary safety concern associated with military training flights is the potential for aircraft mishaps, which may be caused by collisions with other aircraft or objects, weather difficulties, or bird-aircraft strikes. Safety of aircraft operations is often described in terms of the aircraft's mishap rate, represented by the number of mishaps per 100,000 flying hours for each aircraft type and the calculated risk for BASH.

3.6.2 Affected Environment

3.6.2.1 Aircraft Mishaps

Safety Investigation and Hazard Reporting mishaps are categorized by the USAF based on the severity of injury and the amount of damage measured in monetary value (Air Force Guidance Memorandum to DAFI 91-204, *Safety Investigations and Reports*. These are classified as Class A – D. Class A is a critical mishap (e.g., a crash) and Class D is a minor mishap (e.g., an inconsequential bird strike). **Table 3-16** outlines the Air Force-wide mishap rates for the primary aircraft utilizing the Duke MOA. Most aircraft mishaps occur during the landing and take-off phase and not during flight training in airspace; therefore, the expected mishap rates for the MOA would be lower than those outlined herein. Based on ANG records during the last five years or known previously, there have been no recorded mishaps in or near the Duke MOA.

Table 3-16. Mishap Rates Per 100,000 Flying Hours

Aircraft	Class A	Class B	Aircraft Destroyed	Total Fatalities
A-10	0.55	6.54	0.55	0.00
F-16	1.83	1.27	1.41	0.52
C-130	0.43	1.98	0.19	1.40

Source: USAF 2019b.

3.6.2.2 Safety Planning, Awareness Training, Emergency Response, and Alerts

Low-altitude operations are dynamic and highly demanding. Preflight planning, low-altitude awareness training, and in-flight warning systems make up a three-prong approach to ensure low-altitude training is conducted safely. These components emphasize ground and object avoidance, minimizing head-down-time, and implementing on-board warning systems as fail-safes during low-altitude flight.

Preflight Planning. Before each low-level training mission, pilots conduct preflight checks, mission planning and briefing. Two key components of flight preparation for low-altitude operations are route planning and map study. During route planning the pilot determines turnpoints, key references, lines of communication, minimum risk routes, and airspace coordination areas. As low-altitude flight does not allow for a considerable amount of head-down time, the memorization of flight routing and tactical reference points aids in in-flight navigation and mission safety. During map study terrain, obstacle elevations, geographic funneling features, and areas for terrain masking are reviewed. Pilots identify terrain features that are evident and can serve as a stake in the ground for orientation (e.g., a mountain, a large lake, dry lake bed, large intersection). Then a pilot identifies funneling features from these elements to help locate a target, turnpoint, or point of interest. This is known as working big to small, where the mountain or lake serves as the big and the funnel features lead to the small.

Low-Altitude Awareness Training. Pilots go through rigorous training emphasizing low-altitude awareness. Pilots develop task management skills that allow for accomplishing the mission while reducing the probability of ground impact. Pilot tasks during low-altitude missions fall into three main groups (1) terrain clearance tasks, (2) other critical tasks, and (3) noncritical tasks. The lower the pilot operates the aircraft, the more time the pilot focuses on terrain clearance. Terrain clearance becomes a noncritical task only when leaving the low-altitude environment. The following are subtasks associated with terrain clearance.

- **Aircraft Control**. Control of the aircraft is paramount.
- **Altitude Control**. Altitude control establishes the time available for a task. Consideration should be given to climbing to a higher altitude if a task is going to require significant head-down time.
- **Vector Control.** Head-down time can also be increased if there is a positive vector away from the ground and terrain clearance can be assured.

Because of the demanding nature of the low-altitude arena, becoming overtasked (i.e., task saturation) will occur at some point in time. Pilots are trained to recognize task saturation and act to reduce it. Pilots are also conditioned to develop a mental and physical cross-check that establishes acceptable terrain clearance and determines time available for other tasks.

Emergency Response. The 175 WG maintains detailed emergency and mishap response plans to react to an aircraft accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off base. Response would normally occur in two phases. The initial response would focus on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. The NGB would consult with the land use manager to minimize damage and determine site-specific mitigation measures. This would consist of those personnel and agencies primarily responsible to initiate the initial phase. This element would include the Fire Chief, who would normally be the first on-scene Commander, fire-fighting and crash-rescue personnel, medical personnel, security police, and crash-recovery personnel. A subsequent response team would be comprised of a variety of organizations whose participation will be governed by the circumstances associated with the mishap and actions required to be performed. Subsequently, an investigation would be conducted.

Regardless of the agency initially responding to the accident, efforts would be directed at stabilizing the situation and minimizing further damage. If the accident has occurred on non-Federal property, a National Defense Area would be established around the accident scene and the site would be secured to protect classified information or DoD equipment and/or material for the investigation phase. After all required investigations and related actions on the site are complete, the aircraft would be removed.

The Base Civil Engineer would be responsible for managing the cleanup of the site or contracts to an outside agency to accomplish the cleanup. Overall, the purpose of response planning is to:

• Save lives, property, and material by timely and correct response to mishaps;

• Quickly and accurately report mishaps to higher Headquarters; and

• Investigate the mishap to preclude the reoccurrence of the same or a similar mishap**.**

Low-Altitude Alerts and the Ground Collision Avoidance System. Low-altitude alerts issue warnings when descending below a pilot-selected MSL and AGL altitude. The alerts are set during pre-mission planning or changed in flight as necessary. If the warning is triggered during flight, pilots immediately climb above the altitude to reset the warning. Pilots do not maintain flight below published minimums for any reason. In addition, pilots use the Ground Collision Avoidance System (GCAS) while flying at low altitude. GCAS uses data from a variety of internal systems to provide warnings of potential ground impact. The GCAS provides prominent visual and audible warnings if the aircraft descends below 90 ft AGL or when the system predicts conditions that may result in collision with the ground. Pilots remain 1,000 ft above the highest obstacle and 2,000 ft laterally when over congested or populated areas, as well as 500 ft above all known and observed antennas or obstacles.

3.6.2.3 Bird-Aircraft Strike Hazard

The BASH prevention program parameters as required by DAF and FAA pre-flight protocols would be implemented. The 175 WG of the Maryland ANG follows the policies and procedures set in the BASH Plan as put out by the order of the Secretary of the Air Force. It implements AFI 91-202, *USAF Mishap Prevention Program*, DAFI 91-204, and DAFMAN 91-223, *Aviation Safety Investigations and Reports*. The BASH Plan applies to the entire Duke MOA and surrounding area. The BASH Plan would apply as well to the proposed Duke Low MOA.

The USAF Bird Avoidance Model (BAM) and AHAS show the risk of bird hazards for the continental U.S. and Alaska. They use online, near real-time, geographic information system data and data on bird habitat, migration, and breeding characteristics to predict bird movement and the potential risk for bird strikes (USAF 2015). With this information, pilots can informatively schedule flight routes as to minimize the hazard of bird strikes.

More than half of the forested land beneath the proposed Duke Low MOA lies within state parks. A major migration route of the Central Appalachian Northeast Corridor runs through this region, and includes raptors such as Bald Eagles, Red-shouldered Hawks, American Kestrels, Peregrine Falcons, and Golden Eagles. More than 1,000 raptors are reported annually along this route, with a watch site for the Appalachian Flyway just north of the Duke MOA reporting on average, more than 10,000 raptors annually (Hawk Mountain Sanctuary 2019). The topography of the region consists of long, narrow, parallel ridges that concentrate migrating raptor populations in

streamlined formations over the low-lying valleys. The mountainous terrain also creates updraft conditions ideal for slope soaring, an energy-saving technique favored by many raptor species.

Bird-aircraft strikes can result in damage to aircraft or injury to aircrew or local populations in the event of an aircraft crash. Aircraft can potentially encounter birds at altitudes of FL 300 or higher but most birds fly close to the ground. The existing rate of potential bird strikes based on Air Force-wide BASH rates (USAF 2019b) at the floor altitude of 8,000 ft MSL for the Duke MOA is 10.1 strikes per 100,000 hours of flying. The incidence rate of bird strikes under the existing conditions is considered low. Based on ANG records during the last five years, there have been no recorded BASH incidents in or near the Duke MOA.

3.6.3 Significance Criteria

The Proposed Action would have significant effects on safety if the Proposed Action would: substantially increase risks associated with aircraft mishap potential or flight safety relevant to the public or the environment.

3.6.4 Environmental Consequences of the Proposed Action

3.6.4.1 Aircraft Mishaps

The types of aircraft training in the Proposed Duke MOA and associated mishap rates per 100,000 hours would remain unchanged when compared to existing conditions (**Table 3-16**). The time between mishaps is calculated by comparing the mishap rate with the number of hours flown annually, and the total number of hours operating in the Duke MOAs would increase as shown in **Table 2-2**. Overall, mishaps with and without the Proposed Action would remain small and comparable to Air Force-wide rates. These effects would not be considered significant.

3.6.4.2 Safety Planning, Awareness Training, and Alerts

Under the Proposed Action, pilots would continue to conduct preflight planning, participate in low-altitude awareness training, and use low-altitude alerts and the GCAS to ensure low-altitude training is conducted safely. In addition, pilots would continue to follow low-level guidance and remain 1,000 ft above the highest obstacle and 2,000 ft laterally when over congested or populated areas, as well as 500 ft above all known or observed antennas and obstacles (1AFMAN 11-202v3).

Air crews are trained to see and avoid any risks, including in populated areas. All accidents are investigated accordingly with set procedures in place. The 175 WG would continue to follow flight safety regulations dictating emergency and accident response, and investigation include AFI 91-202, DAFI 91-204, AFI 91-204ANGSUP *Safety Investigation and Hazard Reporting*, and DAFI 91-225 *Aviation Safety Programs*. In addition, flight safety regulations such as AFMAN 11-202v1, *Aircrew Training*, AFMAN 11-202v3, AFI 11-418 *Operations Supervisio*n, and AFI 11-214 all contribute the safe operation and use of aircraft. Given the air crew safety planning and awareness

training mentioned previously, the ADS-B equipment is not necessary for the safe operation of aircraft.

International aviation laws determine who has priority when utilizing an airspace. The first priority is aircraft in distress. The second priority is air ambulance services, or small private jets or helicopters that fly to hospitals. Air crews continually monitor communications related to air ambulance services, including LIFE GUARD and life flight. Immediately upon receiving notification that air ambulance services require priority within an airspace, ATCs would contact pilots within the airspace and would evacuate the area immediately. Furthermore, the NGB operates in full compliance with current DAF and FAA requirements. In the event that fire tankers were operating in the MOA, and a Notice to Airmen (NOTAM) would be issued to close the area and NGB would not schedule training. If NGB aircraft were operating during a fire event, see and avoid procedures would be used to avoid conflict with firefighting services. Further, those aircraft would be evacuated from the area.

3.6.4.3 Bird-Aircraft Strike Hazard

The Proposed Action would not result in significant effects on bird strike risk. Most birds fly below 1,000 ft AGL except during migration (USAF 2019b). The BASH program will be used to avoid times and altitudes of heavy migration while still allowing for modified aircraft operations during the migration seasons. Before using any airport, range or airspace in the U.S., a thorough study of the BASH plan is done by aircrew. The BASH program's goal is the preservation of life and property through the reduction of wildlife hazards to aircraft operations. When hazards are severe, flight activity will be restricted to higher altitudes. This is to ensure the safety of aircrew, people on the ground, and wildlife. The development and compliance with a BASH Plan are required by the DAF and the FAA.

Under the Proposed Action, A-10C aircraft would spend approximately 10 minutes or less below 1,000 ft AGL in a given hour of usage during a 2-hour activation window. Overall, during each sortie, aircraft would be down in the low altitude ranges between 500 ft to 100 ft for 2-3 minutes per activation. The training down to 100 ft AGL would be only several seconds and less than 0.5 miles overland in the 2-3 minutes of flight in the low altitude ranges. In addition, 95 percent of aircraft operations would be conducted above 1,000 ft AGL, which is above the level of high risk of bird-aircraft strikes. The calculated number of bird strikes under the Proposed Action is less than four strikes per year based on an annual rate of strikes using the 100,000 flying hours standard. As in the existing conditions, the bird strike potential under the Proposed Action is low (**Table 3-17**). Overall, bird strike rates would remain small and comparable to Air Force-wide rates. These effects would be minor.

Table 3-17. Bird Strike Rates – Proposed Action

Altitude Block	Low Level (100-8,000)	Mid-Level (8,000-18,000)	Total
Strikes Per 100,000 Flying Hours	585.3	10.1	595
Annual Rate of Strikes			
Existing	0.00	0.04	0.04
Proposed	3.57	0.00	3.57

Source: USAF 2019b.

In addition to bird strikes, there is potential for bat-aircraft strikes given the nature of some bat species to fly at high altitudes. Under the Proposed Action, there could be a limited number of overflights that occur at night. A study that looked at 147 recorded bat strikes, in which the pilots reported awareness of the strikes, concluded that the average altitude of bat-aircraft strike occurrence is approximately 1,100 ft AGL (Peurach et al. 2009). Given that aircraft would spend approximately 10 minutes or less below 1,000 ft AGL during each sortie, the potential for bat-aircraft strikes is negligible. In addition, none of the listed bat species are recognized as species commonly found involved in bat-aircraft strikes. However, it should be noted that only 49 percent of bats in USAF reported bat-strikes have been identified to the species level (Peurach et al. 2009).

The analysis indicates that the environmental impact as well as safety impact are minimal. By implementing a BASH plan with an AHAS and BAM, pilots in the Duke MOA could effectively plan flights that reduce the potential for bird and wildlife strikes to levels not considered significant.

3.6.5 No Action Alternative

Selecting the No Action Alternative would result in no additional effects on safety. The modification of the Duke MOA would not occur. There would be no changes in the natural or built environment that could alter, detract, or eliminate use or enjoyment of a place. Safety conditions would remain unchanged when compared to existing conditions.

3.7 SOCIOECONOMICS

3.7.1 Definition of Resource

Socioeconomics is the relationship between economics and social elements, such as population levels and economic activity. There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, employment, and housing data. This analysis considers the attributes of human social and economic interactions associated with the Proposed Action and the impacts that such action may have on the ROI. The ROI is the eight-county area underlying the Duke MOA comprised of Cameron, Clinton, Elk, McKean, Potter, and Tioga counties in Pennsylvania and small portions of Allegany and Cattaraugus County in New York. Socioeconomic areas of discussion include the regional and local economy, local demographics, local housing, and community services.

Socioeconomic impacts may be defined as the environmental consequences of a proposed action in terms of potential demographic and economic changes.

3.7.2 Affected Environment

3.7.2.1 Population

In 2019, the population in the ROI was estimated to be 296,826 (U.S. Census Bureau 2019a). From 2010 to 2019, the total population in the ROI decreased 3.8 percent, which was lower than the growth rate in Pennsylvania and New York (U.S. Census Bureau 2019a). Between 2019 and 2030, the population of the ROI is projected to steadily increase. In 2030 the population in the ROI is projected to be 305,217 (Behney et al 2014 and NY State Department of Labor 2020). **Table 3-18** presents the historic and projected population of the ROI, Pennsylvania and New York.

Table 3-18. Historic and Projected Population

Area	2010	2015	2019	2020	2030	2040
Cameron, PA	5,085	4,869	4,611	4,759	4,422	3,988
Clinton, PA	39,238	39,614	38,915	41,957	44,973	48,164
Elk, PA	31,946	31,370	30,340	30,826	30,081	28,758
McKean, PA	43,450	42,884	41,401	44,480	45,099	44,445
Potter, PA	17,457	17,377	16,806	18,109	18,672	18,504
Tioga, PA	41,981	42,284	40,944	43,227	44,136	44,325
Allegany, NY	48,946	48,070	46,688	46,355	44,580	43,700
Cattaraugus, NY	80,317	78,962	77,121	76,381	73,254	70,468
Pennsylvania	12,702,379	12,779,559	12,791,530	13,230,170	13,759,594	14,132,588
New York	19,378,102	19,673,174	19,572,319	20,146,131	20,604,030	20,794,907

Source: U.S. Census Bureau 2019a, Behney et al 2014, NY State Department of Labor 2020

3.7.2.2 Income and Employment

From 2010 through 2019, the labor force in the ROI decreased 11.0 percent to 135,159 persons. During the same time period, employment in the ROI decreased by 7.0 percent to 128,150 persons, and the number of unemployed decreased by 44.3 percent, reflecting economic recovery after the recession of 2008–2010. Over that same period, the unemployment rate declined from 10.7 percent to 6.7 percent. Pennsylvania and New York experienced similar trends in unemployment rates, decreasing from 8.5 percent to 4.4 percent in Pennsylvania and 8.6 percent to 4.0 percent in New York (Bureau of Labor Statistics 2019). **Table 3-19** presents the employment profile in the ROI, as well as Pennsylvania and New York for 2010 and 2019.

Table 3-19. ROI Employment Profile

Area	Labor Force		Employed		Unemployed		Percent Unemployed	
	2010	2019	2010	2019	2010	2019	2010	2019
Cameron, PA	2,555	2,088	2,233	1,963	322	125	12.6%	6.0%
Clinton, PA	18,749	18,338	16,987	17,347	1,762	991	9.4%	5.4%
Elk, PA	16,686	15,677	15,075	14,911	1,611	766	9.7%	4.9%
McKean, PA	20,048	17,355	18,031	16,435	2,017	920	10.1%	5.3%
Potter, PA	7,802	7,209	6,991	6,784	811	425	10.4%	5.9%
Tioga, PA	20,194	19,148	18,516	18,139	1,678	1,009	8.3%	5.3%
Allegany, NY	24,240	19,441	22,022	18,380	2,218	1,061	9.2%	5.5%
Cattaraugus, NY	39,654	33,884	35,881	32,172	3,773	1,712	9.5%	5.1%
ROI	151,938	135,159	137,746	128,150	16,202	9,028	10.7%	6.7%
Pennsylvania	6,380,949	6,491,640	5,840,887	6,207,627	540,062	284,013	8.5%	4.4%
New York	9,595,362	9,514,378	8,769,723	9,137,551	825,639	376,827	8.6%	4.0%

Source: Bureau of Labor Statistics 2019

Potter County contains most of the proposed Duke Low MOA. Potter County had a per capita personal income of $45,887 and ranked 38th in the state in 2019. In 2008, the per capita was $29,089. The 2019 per capita income reflected an increase of 3.6 percent from 2018 (Bureau of Economic Analysis 2019). The median income for households in Potter County was $45,419 in 2018 (U.S. Census Bureau 2019b). Potter County had a total of 359 business establishments in 2019, with a combined annual payroll of approximately $209 million (U.S. Census Bureau 2019c).

Major employment sectors in the ROI include manufacturing, government and government enterprises, and retail trade. In Potter County, government and government enterprises accounted for approximately 12.7 percent of the total employment, followed by retail trade with 9.9 percent, and manufacturing with 8.9 percent of total employment services. Total employment was 10.2 percent (Bureau of Economic Analysis 2018).

3.7.2.3 Housing

As of 2019, the ROI had 165,481 housing units of which 27.4 percent were vacant. Of the estimated 44,923 vacant units, 2,022 were estimated to be vacant rental units, or 1.45 percent of the housing stock. A majority of vacant rental units are for seasonal, recreational, or occasional use. The percent of owner-occupied units was greater in all counties than the percent of owner-occupied units in Pennsylvania and New York. All counties in the Duke Low MOA had a lower median value of owner-occupied housing and lower monthly gross rents than in Pennsylvania and New York (U.S. Census Bureau 2019b).

3.7.2.4 Community Services

Community services within the ROI include public schools, hospitals, and public safety. Within the eight counties underlying the Duke Low MOA there are 48 school districts with 105 schools

serving a student population of 42,099 during the 2018-2019 school year (NCES 2020). There are 16 hospitals serving the ROI with seven located in Potter County. There are 111 fire departments in the ROI made up of career and volunteer firefighters. There are 72 police departments in the ROI. County Sheriff's Offices provide police protection services in cooperation with Pennsylvania and New York State Police.

3.7.2.5 Tourism

The Pennsylvania Wilds region is one of 11 official tourism regions in Pennsylvania and accounted for approximately four percent of visitor spending in Pennsylvania in 2019. The Pennsylvania Wilds region is comprised of several counties that are part of the socioeconomic ROI including, Cameron, Clinton, Elk, McKean, Potter, and Tioga counties. A review of tourism spending in the Pennsylvania Wilds area shows spending to almost $1.85 billion with visitor spending a large share of their trip budgets on transportation (Tourism Economics 2019).

The region is economically distressed and has seen decades of population loss. State, local, and federal partners have been working together for more than 15 years to establish the Pennsylvania Wilds as an outdoor recreation destination to help diversify rural economies, create jobs, inspire stewardship and improve quality of life. As the coordinating nonprofit for the Pennsylvania Wilds effort, the Pennsylvania Wilds Center for Entrepreneurship invest upwards of $1 million annually working with partners to build the Pennsylvania Wilds region as an outdoor recreation destination.

According to the Pennsylvania Outdoor Visitors Bureau, elk viewing is primarily in Elk and Cameron counties (Pennsylvania Great Outdoors Visitors Bureau, 2022). The estimated population of wild elk in Pennsylvania is 1,400. The peak of elk tourism is during the mating season (rut), which is from August through November. Approximately 520,000 people visited the Elk Country Visitor Center in 2019 (Elk Country Visitors Center, 2021).

3.7.3 Significance Criteria

The socioeconomic impact analysis examines the potential effects of modification of the Duke MOA to establish low-altitude airspace to train and prepare for current and future conflicts on the social and economic resources of the ROI. The level of impacts associated with the Proposed Action is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing, employment). In addition, if potential socioeconomic changes resulting from other factors (e.g. airspace use, noise, and safety) were to result in potential impacts on the population, housing, economic activity, and land values in the ROI secondary impacts may occur. If potential socioeconomic impacts would result in substantial shifts in community characteristics, including property values, employment, income, and social well-being, then impacts would be considered significant.

3.7.4 Environmental Consequences of the Proposed Action

The Proposed Action would be confined within the boundaries of the Duke MOA; therefore, the Proposed Action would have little to no impact on commercial uses or other public economic activity outside the ROI. There would be no construction, development, changes in ground-based operations, or any other activity that would have an effect on the local economy within the ROI. The A-10C aircraft would spend approximately ten minutes or less below 1,000 ft. Overall, during each sortie, aircraft would be down in the low altitude ranges between 500 ft to 100 ft for 2-3 minutes per activation. The training down to 100 ft AGL would be only several seconds and less than 0.5 miles overland in the 2-3 minutes of flight in the low altitude ranges. The aircraft's radar altimeter is used to measure AGL altitude. In forested areas where the tree canopy is approaching 100 ft in height, the aircraft would be at least 100 ft above the tree canopy or 200 ft AGL over the areas. In addition, noise effects would be intermittent over any given area, and no areas would be exposed to noise effects for an extended period. The proposed Duke Low MOA altitudinal mitigation map for state parks and state forests (see **Figure 2-3**) was prepared by the NGB and the 175 WG to address concerns for the most critical sensitive areas. Low altitude avoidance and noise sensitive areas for the proposed airspace would be identified in the local flight instructions for pilots. Pilots would be instructed to avoid these locations by horizontal and vertical distances specified on the map (500 and 1,000 ft AGL) to enhance flight safety, noise abatement, and environmental sensitivity. For these reasons, the Proposed Action would have no significant adverse effects on the local demographics, local economy, tourism, number of persons living in on-base or off-base housing, number of children attending schools in the area, or demand for community services (e.g., medical, police, and firefighting).

3.7.4.1 Population and Demographics

The low population density under the proposed Duke Low MOA makes it unlikely that noise from flight activity would have significant social or economic impacts on the region. Noise is considered the only stressor from the proposed military training operations that would have an effect on socioeconomics. In accordance with AFMAN 11-202v3, aircraft would continue to follow low-level guidance and remain 1,000 ft above the highest obstacle and 2,000 ft laterally when over congested or populated areas, as well as 500 ft above all known or observed antennas and obstacles. The additional considerations provided in **Section 3.2.8.2** of flight constraints would be in effect in certain areas and times of year in the proposed Duke Low MOA, limiting the loudest noise levels at these times and places. In addition, avoidance of noise-sensitive areas would be emphasized to all flying units using the Duke MOA (see **Chapter 5**, Management Actions and Special Procedures).

The Proposed Action would not increase noise levels by more than 1.5 dBA DNL in a noise sensitive area that is exposed to noise above 65 dBA DNL, or generate individual acoustic events loud enough to damage hearing or structures. The Proposed Action would increase overall sound levels (L_{dnmr}) between 0.1 and 1.3 dBA in areas beneath the proposed Duke Low MOA, this

includes wild and natural areas, state parks, and state forests. The Proposed Action would increase noise levels by between 0.4 and 1.3 dBA DNL for all state parks and forests, and other wildlife and recreational areas under the proposed Duke Low MOA. These changes in noise levels would not be perceptible when compared to existing conditions, and noise from aircraft would continue not to contribute appreciably to the overall background levels throughout the region.

3.7.4.2 Housing and Community Services

The complex nature of property valuation factors makes any estimation of the potential effects of noise from airspace modifications on land values highly speculative. Other socioeconomic factors, such as business activity, employment, interest rates, land scarcity (or availability), and the nature of the local housing market are much more likely to affect property values than the change in noise as a result of the proposed training airspace modifications.

Several studies have analyzed property values as they relate to military and civilian aircraft noise. In one study, a regression analysis of property values as they relate to aircraft noise at two military installations was conducted (Fidell et al. 1996). This study found that, while aircraft noise at these installations may have had minor impacts on property values, it was difficult to quantify that impact. Other factors, such as the local real estate market, had a larger impact on property values. Therefore, the analysis was not able to predict the impact of aircraft noise on the property values of two comparable properties.

Another study examined and summarized the results of 33 studies that attempted to quantify the impact of noise on property values (Nelson 2004). It concluded that aircraft noise has the potential to adversely impact property values, specifically, property values could be discounted between 0.5 and 0.6 percent per decibel when compared to a similar property that is not affected by aircraft noise. Additionally, the data indicate that noise effects on property value increases for noise levels above 75 DNL. As illustrated in **Section 3.2**, the noise associated with the Proposed Action is far lower than that associated with an active runway. The noise exposure would be distributed across a vast area and no single location would be expected to receive a consistently high exposure to noise. The highest DNL expected at any of the municipalities under the proposed Duke Low MOA is 53 DNL, which is an increase of 0.1 DNL when compared to existing conditions. This level is much lower than the 65 DNL threshold established for land use restrictions and significantly lower than 75 DNL which has been indicated to affect property values. Given the low expected DNL values and the distribution of the training activity across such a large area, it would not be expected that the Proposed Action would have any quantifiable impacts to the existing housing values within the region of influence.

There were no significant impacts identified for land use (**Section 3.3.4**) or wildlife (**Section 3.4.4**) that would result in impacts on the population, housing, economic activity, and land values. Aircraft operations conducted below 500 ft AGL would be approximately one percent of the overall aircraft utilization and broadly distributed over time and space within the proposed Duke

Low MOA. No significant impacts to the intrinsic qualities of the region that support tourism and local business and commerce, including the fishing industry, hunting, fishing and adventure guides and flightseeing are expected from the Proposed Action.

3.7.4.3 Outdoor Recreation and Tourism

There would be no construction, development, changes in ground-based operations, or any other ground-disturbing activity that would have an effect on tourism within the ROI. The influence of noise may impact the quality of the tourist experience, however; as discussed above, noise from aircraft would not contribute appreciably to the overall background levels throughout the region. In addition, noise effects would be intermittent over any given area in the MOA based on the proposed use of the airspace, and no areas would be exposed to noise effects for an extended period. Pilots would also be instructed to avoid noise sensitive areas. Individual overflights would be loud enough to momentarily interrupt speech on the ground. These events would annoy some individuals beneath the Duke Low MOA but would not be frequent enough to create areas of incompatible land use. This would include population centers as well as wild and recreational areas.

A Potter County Commissioner and the Pennsylvania Wilds Center for Entrepreneurship stated that the Proposed Action would be detrimental to business and tourism. Noise from aircraft operations under the Proposed Action would not exceed 65 dBA DNL, and would be compatible with all land uses. In accordance with AFMAN 11-202v3, aircraft would continue to follow low-level guidance and remain 1,000 ft above the highest obstacle and 2,000 ft laterally when over congested or populated areas. As stated below, the Proposed Action would not significantly impact tourism based on implementation of management actions, special procedures (see **Chapter 5**), and altitudinal mitigation (see **Figure 3-2**) for state parks and state forests.

Noise from the proposed aircraft operations would not be considered significant when considering the public's use and enjoyment of the state parks and forests, and other wildlife and recreational areas under the proposed Duke Low MOA. In a U.S. Forest Service study, the majority of recreational users interviewed were not annoyed by overflights (USFS 1992). The major emphasis of this study was to determine the effects of aircraft overflights on visitor enjoyment. Input from recreational visitors was obtained by means of personal and telephone interviews during and shortly after their recreational visits. No statistically reliable relationships were found between annoyance due to the sight or sound of overflights and respondents' reported intent to revisit. Intention to revisit was also unrelated to aspects of visits that respondents reported liking least. The summary of findings from the study of the impacts of aircraft overflights on wild and natural areas include the following highlights.

- Aircraft noise intrusions did not appreciably impair surveyed wilderness user's overall enjoyment of their visits to wilderness areas nor reduce their reported likelihood of repeat visits.

- The majority of wilderness users interviewed were not annoyed by overflights, a minority (16 percent) was annoyed in some degree, and a smaller minority (4 percent) highly annoyed by overflights.
- Overflights were only rarely cited as the least liked feature of visits to wilderness areas.
- Low-altitude, high-speed aircraft (i.e., military tactical aircraft) were reported as, the most annoying type of aircraft to hear or see.
- Although many respondents were not exposed to noise from low-altitude, high-speed flights, those who were exposed were often annoyed by them.
- The impact of aircraft overflights in wilderness areas differs significantly from impacts in residential or urban communities.

A National Park Service (NPS) study found that only 2 to 3 percent of visitors can be expected to report impact from hearing or seeing aircraft (NPS 1994). Park visitors reported that their enjoyment and experience is affected by noise from a number of sources including rotary and fixed-wing aircraft, snowmobile and other vehicle noise, loud talking, and other visitor sounds. The NPS study found that a variety of factors (e.g., personal, proximity, setting, activity) determine an individual's reaction to an overflight and impacts on visitors from aircraft are only one of numerous factors that can affect visitor enjoyment. The overall conclusions regarding overflights include the following highlights.

- Aircraft overflights can cause impacts to park resources and values.
- For certain visitors, for visitors engaging in certain activities, and for certain areas, there is a very real potential for overflights to impact parks' natural and cultural resources, visitor experiences, and solitude and tranquility.
- The NPS perspective is that there are impacts to visitors from aircraft overflights depending upon location, visitor activity, aircraft-produced sound exposure, ambient sound levels, and other factors.

Decades of research have reported the effects of aircraft noise on residential populations near airports. However, it has long been recognized that these effects and the corresponding residential dose-response relationships are not applicable to visitors to national parks and other natural areas as the ambient environments, aircraft overflight patterns, and population expectations in these settings are different than in residential areas surrounding airports (Rapoza et al. 2015). In their questionnaire study, Rapoza et al. (2015) assessed aircraft overflights for helicopters, propeller-aircraft, and high-altitude jets. Where possible, they identified overflights as air tour, general aviation, commercial aviation, or military. Their analysis of approximately 3,200 day-hike visitor experience surveys and associated aircraft overflight noise-exposure dose measurements from seven sites at four national parks indicated that the percent of visitors reporting moderate or more annoyance at 70 dBA DNL was approximately 10 percent from helicopter overflights and approximately five percent from propeller planes and high-altitude jets. Half of the questionnaire respondents had noise exposures mostly attributable to helicopter air tour overflights and the

remaining half had noise exposure attributable to general aviation and high-altitude commercial overflight (Rapoza et al. 2015).

There is a lack of published studies on quantifiable impact from aircraft overflights in MOAs to local economies related to outdoor recreation and tourism. While there are possible impacts on recreation and tourism in the parks and natural areas beneath the proposed Duke Low MOA airspace, there are no data to forecast a quantifiable impact on outdoor recreation and tourism from the proposed overflights. The likelihood of an individual experiencing an overflight would be low and intermittent because the distribution of proposed training would occur across a vast area of airspace (1.4 million acres).

PA DCNR provided recommendations to lessen the anticipated impacts of the Proposed Action on hunting by avoiding interference with key recreational activities. The Proposed Action would comply with this recommendation by minimizing interference with hunting activities because there would be very little use on weekends, no use on federal holidays, and the majority of the time that the airspace would be used would occur during the mid-day, when hunting is least affected. Early morning and late evening are the times when wildlife is most active and the airspace would not be used during those times, as discussed in **Section 3.3.4.1**.

Based on information provided for the Proposed Action in **Tables 2-2** and **2-3** and **Section 3.2**, the noise exposure from A-10 and F-16 operations conducted below 7,000 ft MSL would be loud enough to interfere with communication on the ground for approximately 0.7 to 1.2 miles in all directions or an average area of 2.4 square miles at any given time while in the proposed Duke Low MOA. Utilization of Duke MOA has occurred historically for decades, so to some degree, aircraft noise is not new to the region. What is new is that intermittent operations would occur at lower altitudes than what is currently conducted. Management actions and special procedures specified in **Chapter 5** would be implemented under the Proposed Action to reduce any potential effects. In addition, the proposed Duke Low MOA altitudinal mitigation for state parks and state forests (see **Figure 3-2**) would be implemented to address concerns for the most critical sensitive areas. Low altitude avoidance and noise sensitive areas for the proposed airspace would be identified in the local flight instructions for pilots. Pilots would be instructed to avoid these locations by horizontal and vertical distances specified on the map (500 and 1,000 ft AGL) to enhance flight safety, noise abatement, and environmental sensitivity. Considering implementation of management actions, special procedures, and altitudinal mitigation for state parks and state forests, the Proposed Action would not significantly impact tourism.

3.7.5 No Action Alternative

The No Action Alternative would result in no change to current Duke MOA airspace use and management. Establishment of the proposed Duke Low MOA would not occur. There would be no impacts to socioeconomic resources.

3.8 ENVIRONMENTAL JUSTICE

3.8.1 Definition of Resource

Executive Orders direct federal agencies to address disproportionate environmental and human health effects in minority and low-income communities and to identify and assess environmental health and safety risks to children.

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, pertains to Environmental Justice issues and relates to various socioeconomic groups and disproportionate impacts that could be imposed on them. The EO requires that "…each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.". EO 12898 was enacted to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of Environmental Justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a Proposed Action.

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, states that each federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

For the purposes of this analysis, minority populations are defined as Alaska Natives and American Indians, Asians, Blacks or African Americans, Native Hawaiians, and Pacific Islanders or persons of Hispanic origin (of any race); low-income populations include persons living below the poverty threshold as determined by the US Census Bureau (USCB); and youth populations are children under the age of 18 years.

The ROI for Environmental Justice includes the proposed Duke Low MOA and the surrounding environs, which incorporates the areas under the existing Duke MOA. Minority, low-income, and youth populations that could be disproportionately impacted by the project are addressed for the counties in the ROI and are compared to those populations in New York and Pennsylvania.

3.8.2 Affected Environment

3.8.2.1 Minority and Low-Income Populations

This section identifies minority or low-income populations that could potentially be affected by the Proposed Action. For the purposes of this evaluation, minority refers to people who identified themselves in the U.S. Census as Black or African American, Asian, or Pacific Islander, American

Indian or Alaskan Native, other non-White races, or as being of Hispanic or Latino origin. Persons of Hispanic and Latino origin may be of any race (CEQ 1997). The CEQ identifies these groups as minority populations when either 1) the minority population of the affected area exceeds 50 percent or 2) the minority population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or appropriate unit of geographical analysis. While not defined by the CEQ, the term "meaningfully greater" for the purposes of this EA has been interpreted to mean that the total minority population percentage is more than the minority population percentage of the geographic region of comparison. In this case, the geographic region of comparison is the state in which each census tract is located. Poverty (i.e., low-income) status is determined by dollar-value thresholds that vary by family size and composition. If a family's total income is less than the dollar-value of the corresponding threshold, then that family and every individual in the household are considered to be in poverty. For the purposes of this EA, a meaningfully greater low-income population percentage is determined to be higher than that of the state in which each census tract is located.

Changes in the noise environment were the primary consideration in the analysis, and as such, determinations are made as to whether changes in the noise environment would adversely affect the health or environment of populations living in the affected areas.

Table 3-20 provides the total population, and percentages of low-income, minority, Hispanic or Latino, and youth for the census tracts within the ROI. Each are then compared to their respective state. Minority, low-income, and youth population percentages that exceed the respective state population percentages for a specific group are identified as shaded blocks in **Table 3-20**.

Eleven of the census tracts within the ROI have a low-income population percentage that exceeds the state in which it is located.

None of the census tracts within the ROI have a minority population percentage that exceeds the minority population percentage of the state in which it is located. In addition, none of the census tracts within the ROI have a Hispanic or Latino population percentage that exceeds the Hispanic or Latino population percentage of the state in which it is located.

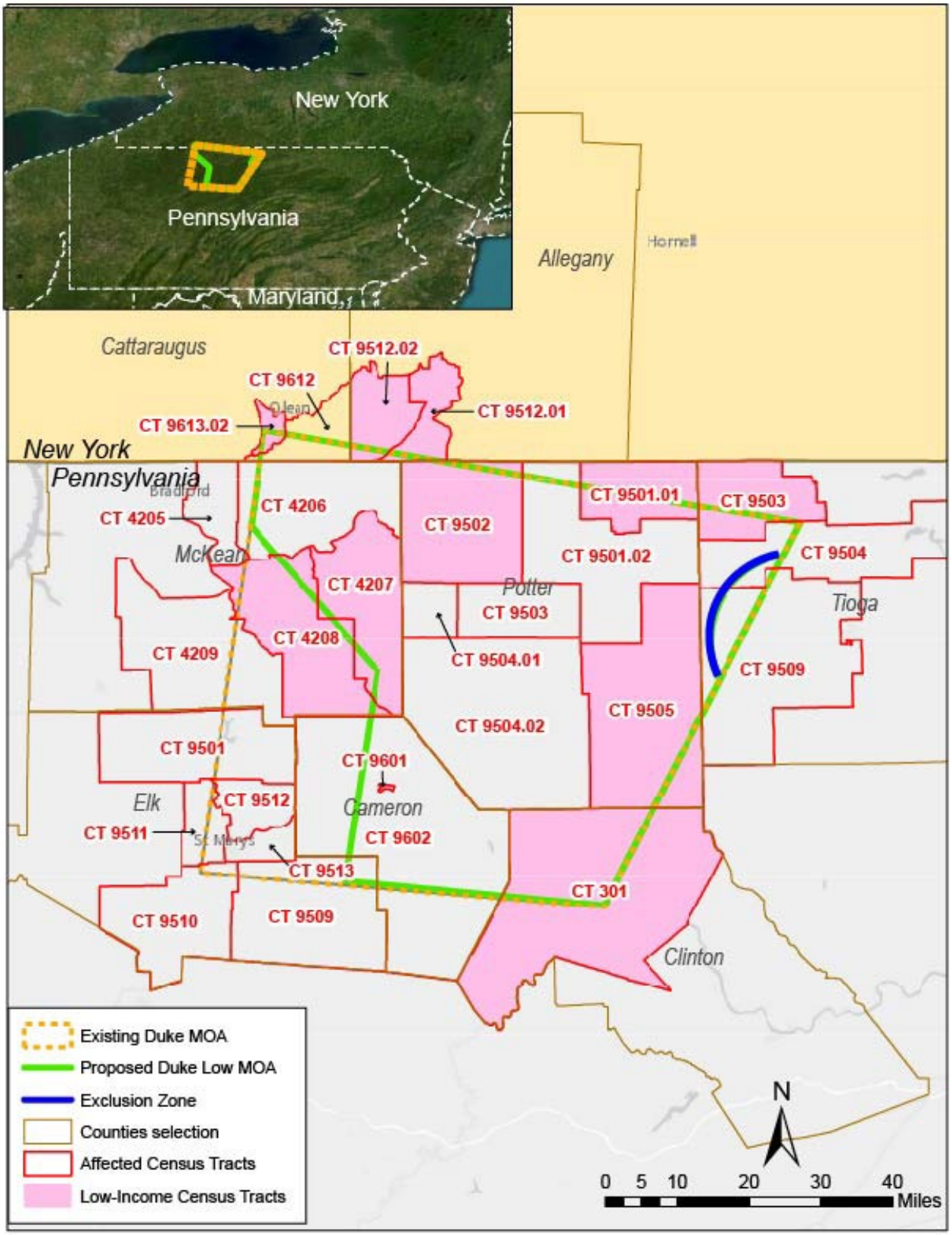


Figure 3-20. Low Income Populations within the ROI

3-20. Minority and Low-Income Population within the ROI

	Total Population	Percent Low-Income[a]	Percent Minority[b]	Percent Hispanic or Latino[c]	Percent Children[d]
State of New York	**20,201,249**	**13.9%**	**44.8%**	**19.5%**	**20.7%**
Allegheny County					
Census Tract 9512.01	2,301	20.1%	5.2%	0.5%	22.1%
Census Tract 9512.02	2,475	17.3%	6.2%	0.6%	24.7%
Cattagaurus County					
Census Tract 9612	3,426	8.1%	5.9%	1.9%	20.3%
Census Tract 9613.02	2,465	14.2%	12.2%	4.3%	8.6%
State of Pennsylvania	**13,002,700**	**12.1%**	**25.0%**	**8.1%**	**20.6%**
Cameron County					
Census Tract 9601	1,923	26.7%	6.0%	2.8%	14.6%
Census Tract 9602	2,624	11.6%	5.6%	1.2%	17.5%
Clinton County					
Census Tract 301	2,877	19.1%	4.4%	1.2%	18.8%
Elk County					
Census Tract 9501	1,573	11.5%	3.8%	0.6%	18.0%
Census Tract 9509	2,179	7.9%	4.1%	0.6%	23.0%
Census Tract 9510	4,942	4.8%	4.1%	0.8%	19.6%
Census Tract 9511	5,553	8.4%	4.4%	1.2%	14.8%
Census Tract 9512	2,005	8.2%	3.5%	0.8%	15.8%
Census Tract 9513	5,180	10.3%	4.5%	0.8%	21.6%
McKean County					
Census Tract 4205	2,851	10.3%	5.9%	1.0%	19.8%
Census Tract 4206	5,152	12.1%	5.0%	0.5%	16.5%
Census Tract 4207	4,357	16.2%	6.2%	1.1%	23.3%
Census Tract 4208	3,640	13.1%	4.0%	0.9%	20.5%
Census Tract 4209	2,069	11.9%	3.9%	0.5%	20.3%
Potter County					
Census Tract 9501.01	2,240	16.4%	2.5%	0.7%	25.3%
Census Tract 9501.02	2,109	7.8%	5.3%	1.8%	18.7%
Census Tract 9502	3,091	13.8%	4.7%	1.5%	21.2%
Census Tract 9503	4,157	10.9%	6.8%	2.1%	19.0%
Census Tract 9504.01	1,099	10.6%	5.2%	2.7%	18.9%
Census Tract 9504.02	1,694	3.2%	3.4%	0.6%	22.1%
Census Tract 9505	2,006	18.8%	3.8%	0.9%	18.3%
Tioga County					
Census Tract 9503	3,695	20.4%	4.6%	1.2%	22.5%
Census Tract 9504	4,089	10.5%	4.8%	0.9%	17.5%
Census Tract 9509	3,949	8.9%	4.6%	1.1%	16.4%

Source: U.S. Census Bureau, 2022

a- US Census Bureau, 2022a. Poverty Status in the Past 12 Months. Table 1701
b- US Census Bureau, 2022b. Race. Table P1.
c- US Census Bureau, 2022c. Hispanic or Latino, and Not Hispanic or Latino by Race. Table P2
d- US Census Bureau, 2022d. Age and Sex. Table S0101.

3.8.2.2 Protection of Children

This section identifies populations under the age of 18 that could potentially be affected by the Proposed Action. As shown in **Table 3-20**, the percentage of the population estimated to be under age 18 was 20.7 percent New York and 20.6 percent in Pennsylvania. Nine census tracts within the ROI have a youth population percentage that exceeds that of the state in which it is located. Census Tracts 9512.02 and 9501.01 have the largest percentage of the population under age 18 with 24.7 and 25.3 percent, respectively.

3.8.2.3 Significance Criteria

Environmental Justice analysis applies to potential disproportionate effects on minority, low-income, and youth populations. Environmental Justice issues could occur if an adverse environmental or socioeconomic consequence to the human population fell disproportionately upon minority, low-income, or youth populations. Ethnicity and poverty status were examined and compared to state and national data to determine if these populations could be disproportionately affected by the Proposed Action.

3.8.3 Environmental Consequences of the Proposed Action

No significant impacts were identified in association with any resource areas that would be anticipated to adversely impact the health or environment of minority or low-income populations or children living under the areas affected under any of the alternatives. Noise levels in the airspace would remain below 65 dB DNL and would not create a health concern. Air emissions would not exceed any defined thresholds that are in place to protect public health. The proposed training operations would be spread across a vast area and are not expected to occur in any one location on a repetitive basis; therefore, no population would be exposed to a disproportionate number of overflights and the associated impacts from those overflights. Since there would not be significant impacts that would adversely affect minority or low-income populations or children, no impacts to Environmental Justice are anticipated. There would be no disproportionate impact to minority or low-income populations or children under the Proposed Action.

3.8.4 No Action Alternative

Under the No Action Alternative, the proposed Duke Low MOA would not be implemented, and the existing Duke MOA would remain in use. No changes in flight altitudes would be implemented and current operations in the existing Duke MOA would continue. Low-income, minority, and youth populations would not be disproportionately affected.

4.0 CUMULATIVE EFFECTS

Cumulative impacts on environmental resources result from the Proposed Action when combined with other past, present, and reasonably foreseeable projects in an affected area. Cumulative impacts can result from minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, or local) or persons. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the near future is required.

4.1 APPROACH TO CUMULATIVE EFFECTS ANALYSIS

This cumulative impact analysis includes three major considerations, including: (1) determine the scope of the cumulative analysis, including relevant resources, geographic extent, and timeframe; (2) conduct the cumulative effects analysis; and (3) determine the cumulative impacts to relevant resources.

4.1.1 Scope of Cumulative Effects Analysis

CEQ guidelines require that potential cumulative impacts be considered over a specified period (i.e., from past through future). The appropriate time for considering past, present, and reasonably foreseeable future projects can be the design life of a project, or future timeframes used in local master plans and other available predictive data. Determining the timeframe for the cumulative impacts analysis requires estimating the length of time the impacts of a Proposed Action would last and considering the specific resource in terms of its history of degradation. The Proposed Action includes the future military training exercises within the proposed Duke Low MOA. While training and testing requirements change over time – in response to world events and several other factors – the general types of activities addressed in this EA would be conducted as often as annually, and the potential impacts associated with those operations would occur as often as annually. Therefore, the cumulative impacts analysis presented herein is not bound by a specific future timeframe.

Per CEQ guidelines, to assess the influence of a given action, a cumulative impact analyses should be conducted using existing, readily available data and the scope of the cumulative impact analysis should be defined, in part, by data availability. Consequently, only past projects or reasonably foreseeable future projects with the potential to contribute to cumulative impacts of the Proposed Action or its alternatives have been evaluated in this section. While the cumulative impacts analysis is not limited by a specific timeframe, it should be recognized that available information, uncertainties, and other practical constraints limit the ability to analyze cumulative impacts for the indefinite future. Consequently, future actions that are speculative are not considered in this EA.

Cumulative effects may occur when there is a relationship between an action and other actions expected to occur in a similar location or during a similar period. Actions overlapping with or in

close proximity to the Proposed Action could reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally would tend to offer a greater potential for cumulative effects.

The Proposed Action includes the establishment of the Duke Low MOA. Implementation of the Proposed Action would not include the development or construction of any facilities, result in or require any ground-disturbing activities, or include any changes to work force levels under the influence of the Duke Low MOA.

4.1.2 Past, Present, and Reasonably Foreseeable Actions

No past, present, and reasonably foreseeable future action related to airspace use and management have been identified. The private airports beneath the proposed Duke Low MOA have low use and are limited to VFR-only operations. These are uncontrolled airfields with no requirements for control tower operations. Permission from the owner is required prior to landing and the runways are turf grass. No information on reasonably foreseeable actions was identified. Considering the Wellsboro exclusion zone and the avoidance of overlap with St Marys Airport, Bradford Regional Airport, and Wellsville Municipal Airport, no instrument approach patterns would be affected by the proposed Duke Low MOA airspace. Forecasted growth for the Bradford Regional Airport is modest activity with no change in critical aircraft class and no change in airport design standards (https://www.bradfordairport.net/master-plan). The Giermek Executive Airport has a turf grass runway that is open to public use for local general aviation using VFR procedures, no information on reasonably foreseeable actions was identified.

4.1.3 Cumulative Effects Analysis and Potential Effects

For the purposes of this EA, no projects with the potential to affect or interact with the proposed airspace were identified. Additionally, no other projects that typically affect or interact with airspace proposals were identified. For example, review of recently completed, in-progress, and planned projects did not identify any proposed projects, proposed federally designated critical habitat, or proposed protected areas (e.g., recreation areas, natural areas, etc.). Consequently, as no other projects have been identified as either in close proximity to the Duke Low MOA or as having a cumulative impact on shared resources, implementation of the Proposed Action would not contribute to any significant adverse cumulative impacts. A review of cumulative effects under each resource carried forward for detailed analysis in the EA is provided below.

4.1.3.1 Airspace Management

The Proposed Action would not result in significant adverse effects on airspace management. Proposed airspace operations would pose minimal to moderate constraints to existing and future commercial and civilian air traffic when activated. On the days that the proposed Duke Low MOA

would be activated, it would normally be used for one hour in the morning between the hours of 10:00 a.m. – 12:00 p.m. and one hour in the afternoon between the hours of 2:00 p.m. and 4:00 p.m. Cumulative effects on airspace management in the proposed Duke Low MOA would not be considered significant when compared to existing conditions.

4.1.3.2 Noise

The Proposed Action would not result in significant effects on the noise environment. Effects would be due to noise from the intermittent introduction of low-altitude military overflights in the proposed Duke Low MOA. The Proposed Action would not increase noise levels by more than 1.5 dBA DNL in a noise sensitive area that is exposed to noise above 65 dBA DNL or generate individual acoustic events loud enough to damage hearing or structures. Cumulative effects on the noise environment beneath the proposed Duke Low MOA would not be considered significant when compared to existing conditions.

4.1.3.3 Land Use

The Proposed Action would not result in significant effects on land use or land users. Minor effects would be due to the intermittent introduction of low-altitude military overflights in the proposed Duke Low MOA. Noise from aircraft operations under the Proposed Action would not exceed 65 dBA DNL and would be consistent with all land uses. Management actions and special procedures specified in **Chapter 5** would be implemented under the Proposed Action to reduce any potential effects. In addition, the proposed Duke Low MOA altitudinal mitigation for state parks and state forests would be implemented to address concerns for the most critical sensitive areas. Considering implementation of management actions, special procedures, and altitudinal mitigation for state parks and state forests, the Proposed Action would not significantly impact land use. Cumulative effects on land use beneath the proposed Duke Low MOA would not be considered significant when compared to existing conditions.

4.1.3.4 Biological Resources

The Proposed Action would not result in significant effects on biological resources. Minor effects would be due to the intermittent introduction of low-altitude military overflights in the proposed Duke Low MOA. The Proposed Action would not reduce the distribution or viability of species or of critical habitats. Effects on wildlife and their habitats beneath the proposed Duke Low MOA would be negligible, and not measurably different when compared to existing conditions. Cumulative effects on biological resources would not be considered significant when compared to existing conditions.

4.1.3.5 Cultural Resources

While effects resulting from the introduction of noise into historic property settings are expected from the Proposed Action, those effects would not significantly affect the features of those properties that make them eligible for listing in the NRHP; therefore, the proposed action would have no adverse effects to historic properties or culturally significant places.

4.1.3.6 Safety

The Proposed Action would not result in significant effects on safety. Effects would be due to the intermittent introduction of low-altitude military overflights in the proposed Duke Low MOA. Pilots would continue to conduct preflight planning, participate in low-altitude awareness training, and implement a BASH plan with an AHAS and BAM to ensure low-altitude training is conducted safely. Cumulative effects on safety would not be considered significant when compared to existing conditions.

4.1.3.7 Socioeconomics

The Proposed Action would not result in significant effects on socioeconomic resources. Effects would be due to the intermittent introduction of low-altitude military overflights in the proposed Duke Low MOA. The Proposed Action would not cause direct effects on the local economy and related effects on other socioeconomic resources or result in substantial shifts in community characteristics, including property values, employment, income, and social well-being. Management actions and special procedures specified in **Section 5.0** would be implemented under the Proposed Action to reduce any potential effects. In addition, the proposed Duke Low MOA altitudinal mitigation for state parks and state forests would be implemented to address concerns for the most critical sensitive areas. Considering implementation of management actions, special procedures, and altitudinal mitigation for state parks and state forests, the Proposed Action would not significantly impact land use and socioeconomics. Cumulative effects on socioeconomic resources would not be considered significant when compared to existing conditions.

4.1.3.8 Environmental Justice

The Proposed Action would not result in significant impacts to any resources that would adversely impact the health or environment of minority or low-income populations or children living beneath existing or proposed airspace. The past and ongoing activities identified contribute to the baseline conditions against which the impacts of the Proposed Action were compared. No ongoing or future activities have been identified that would create impacts that would disproportionately or adversely affect minority or low-income populations or children.

5.0 MANAGEMENT ACTIONS AND SPECIAL PROCEDURES

This chapter summarizes special operating procedures associated with this EA. Evaluations contained in this EA have determined that no significant environmental effects would result from implementation of the Proposed Action; therefore, no mitigation would be required. This determination is based on thorough review and analysis of existing resource information, coordination with installation personnel, and relevant agency coordination.

The following management actions and special procedures are currently or would be implemented:

- The Duke Low MOA would only be activated on an as-needed basis and then returned to the FAA when not in use – allowing for continued responsible stewardship of the regional airspace, allowing use by others when not needed for training exercises, and helping to minimize potential conflicts with other users.
- The proposed activation times of the Duke Low MOA up to 24 hours prior would be maintained on the FAA SUA v4.0 application at: https://sua.faa.gov/sua/siteFrame.app.
- Flying schedules would normally be transmitted to ZOB the day prior to activation, but no later than 4 hours prior, at which time a NOTAM is generated.
- Standard preflight mission planning requirements would include monitoring the AHAS and modifying or cancelling sorties in areas or periods with "moderate" to "severe" BASH risks.
- Procedures would be established with ZOB to give all Life Alert helicopters priority access to all hospital heliports located underneath proposed airspace.
- Military aircraft training in the proposed Duke Low MOA would maintain contact with the controlling agency to ensure proper separation with all non-participating aircraft.
- The proposed Duke Low MOA would only be activated and used during visual meteorological conditions, whereas VFR flight rules would always be permitted. (i.e., Pilots would always have sufficient visibility to maintain visual separation from terrain and other aircraft during approach and departure from the airports).
- Military safety officers would continue to utilize the MACA educational and outreach program to conduct public awareness and outreach.
- Upon request from the FAA or airports affected, written procedures would be established (per FAA JO 7400.2) to ensure proper IFR separation.
- A 500 ft AGL overflight buffer would be maintained over obstacles such as radio towers, windmills and oil drilling rigs per AFMAN 11-202v3).

- A 1,000 ft AGL floor would be implemented over certain sensitive areas of concern in the southern portions of the Duke Low MOA, specifically over the Hammersley Wild Area, Forrest H Dutlinger Natural Area and the Kettle Creek State Park.
- A 1,000 ft overflight AGL floor and a 0.5 NM lateral buffer around Bald and Golden Eagle nests would be incorporated per Air Force direction.
- A 500 ft AGL floor would be implemented over certain sensitive areas of concern specifically all remaining State Parks, Sinnemahoning Creek and the historical Austin Dam ruins.
- BASH prevention program parameters as required by DAF and FAA pre-flight protocols would be implemented.
- Prior to implementation of the Proposed Action, the ANG Eastern Area Defense Sector would coordinate with the PGC to establish a communications plan with protocols to allow for de-confliction of the airspace as needed during activities, such as annual species population surveys.
- The ANG Eastern Area Defense Sector would coordinate with PA and NY USFWS Ecological Services Field Offices for consistency with bald eagle management guidelines and conservation measures.
- Questions and concerns regarding 175 WG training operations can be presented to the Eastern Area Defense Sector at https://www.eads.ang.af.mil/Contact-Us/. This Office will be able to address concerns regarding 175 WG operations.

In addition, the DAF and FAA outline other ongoing management requirements and special procedures for SUAs. The Proposed Action would proceed in full compliance with current DAF and FAA requirements, including:

- FAA Order JO 7610.4, Special Operations;
- FAA Order JO 7110.65, Air Traffic Control;
- FAA Order JO 7400.2, Procedures for Handling Airspace Matters;
- FAA Order 1050.1, Environmental Impacts: Policies and Procedure;
- DAFMAN 13-201, Airspace Management;
- AFI 32-1015, Integrated Installation Planning;
- AFI 11-214, Air Operations Rules and Procedures; and
- AFI 11-200, Aircrew Training, Standardization/Evaluation, and General Operations Structure.

This listing is not all-inclusive; the ANG and the 175 WG would continue to comply with all applicable regulations and guidance.

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7.0 LIST OF PREPARERS

Delight Buenaflor, Tetra Tech, Inc.
Socioeconomics Specialist
B.A., Biology
Years of Experience: 20

Joseph J. Campo, Tetra Tech, Inc.
Project Manager
PhD, Wildlife Ecology
M.S., Wildlife Ecology
B.S., Forestry
Years of Experience: 35

Katherine Gregory, Tetra Tech, Inc.
Biological Resources
B.S. Earth and Environmental Science
Years of Experience: 3

Maher Itani, Tetra Tech, Inc.
Quality Assurance Manager
M.E.A. Engineering Administration
B.S. Civil Engineering
Years of Experience: 30

Timothy Lavallee, P.E., LPES, Inc. Engineering and Planning
Senior Noise and Air Quality Specialist
M.S., Civil and Environmental Engineering
B.S., Mechanical Engineering
Years of Experience: 30

Joe Rexroad, Tetra Tech, Inc.
Senior Airspace Analyst
B.A., Architecture & Urban Design
Years of Experience: 30

Kathy Roxlau, Tetra Tech, Inc.
Cultural Resources Specialist
M.A. Anthropology
B.A. Anthropology
Years of Experience: 28