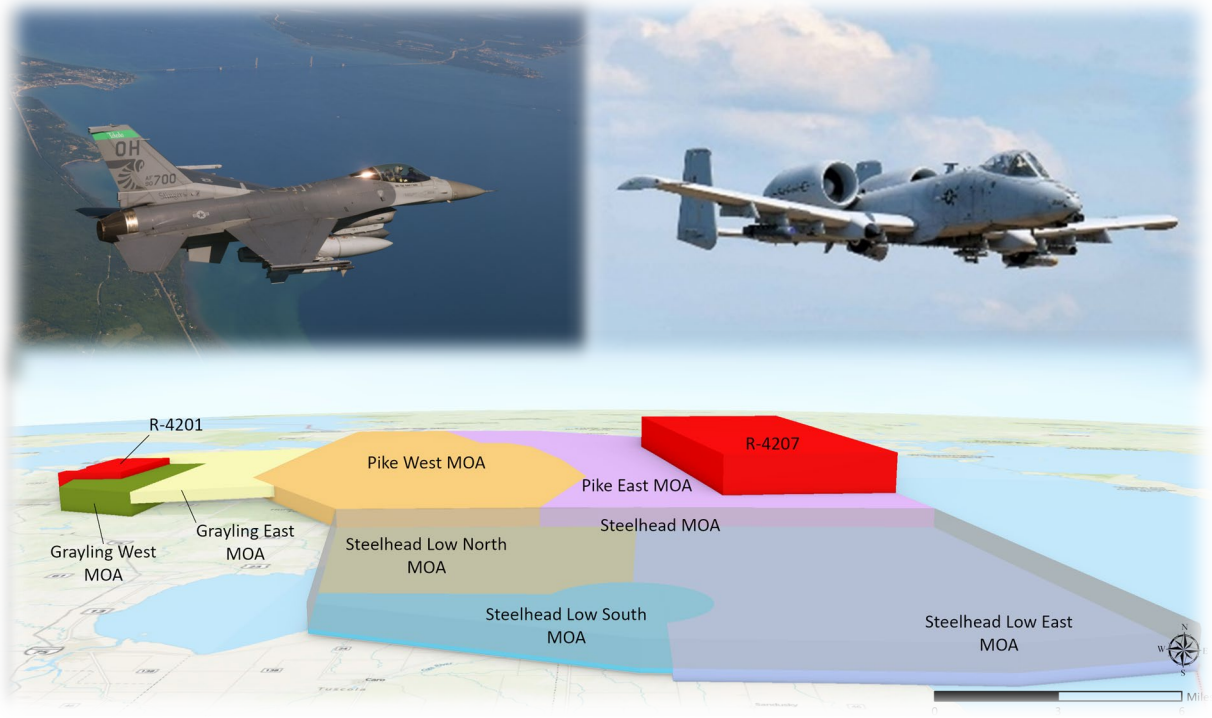
Draft

Environmental Assessment for

Modification and Addition of Airspace at the Alpena Special Use Airspace Complex



Michigan Air National Guard
Alpena Combat Readiness Training Center
Alpena, Michigan

November 2022

Cover graphics: (Left) F-16 Fighting Falcon over Mackinaw Bridge, Michigan (180 FW, 2015);
(Right) A-10 Thunderbolt at the Grayling Range (Public Affairs, 2019);
(Bottom) Three-Dimensional Representation of Proposed Airspace.

Disclosure Statement

This Draft Environmental Assessment (EA) is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] 1500–1508), and 32 CFR 989, Department of the Air Force's (DAF) Environmental Impact Analysis Process (EIAP), as well as the Federal Aviation Administration's (FAA) Environmental Impacts: Policies and Procedures (FAA Order 1050.1F).

DAF EIAP implementation provides opportunities for public input on Air National Guard NEPA decision making by allowing the public to offer inputs on alternative ways for the National Guard Bureau (NGB) to accomplish what is being proposed and solicit comments on Draft NEPA analysis of environmental effects.

Public commenting allows NGB to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

This document has been certified that it does not exceed 75 pages, not including appendices as defined in 40 CFR 1501.5(f). As defined in 40 CFR 1508.1(v), a "page" means 500 words and does not include maps, diagrams, graphs, tables, and other means of graphically displaying quantitative or geospatial information.

Written comments should be sent to the National Guard Bureau, Attn: Ms. Kristi Kucharek, 3501 Fetchet Avenue, Joint Base Andrews, MD 20762-5157 or emailed to NGB.A4.A4A.NEPA.COMMENTS.Org@us.af.mil with subject ATTN: ALPENA SUA EA.

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Acronyms and Abbreviations

122 FW	122d Fighter Wing
127 WG	127th Wing
180 FW	180th Fighter Wing
ACAM	Air Conformity Applicability Model
AGL	above ground level
ALTRV	Altitude Reservation
ANG	Air National Guard
ANGB	Air National Guard Base
APE	Area of Potential Effects
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
ATCAA	air traffic control assigned airspace
BASH	Bird-/Wildlife-Aircraft Strike Hazard
BMP	best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRTC	Combat Readiness Training Center
CT	census tract
DAF	Department of the Air Force
dBA	A-weighted decibels
Dkey	Michigan Determination Key
DNL	Day-Night Average Sound Level
DOD	Department of Defense
DOPAA	Description of Proposed Action and Alternatives
EA	Environmental Assessment
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EIAP	Environmental Impact Analysis Process
FAA	Federal Aviation Administration
FL	Flight Level
FMS	Foreign Military Sales
GDP	Gross Domestic Product
IFR	Instrument Flight Rules
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IPaC	Information for Planning and Consultation
JO	Joint Order
JTE	Joint Threat Emitter
LASDT	Low Altitude Step Down Training
Ldnmr	Onset-Adjusted Monthly Day-Night Average Sound Level
LFE	Large Force Exercise
Lmax	Maximum Sound Level
LOA	Letter of Agreement
LOWAT	Low Altitude Air-to-Air Training
MDNR	Michigan Department of Natural Resources
MIANG	Michigan Air National Guard
MOA	Military Operations Area
MSL	above mean sea level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NOTAM	Notice to Airmen
NREPA	Natural Resources and Environmental Protection Act
NRHP	National Register of Historic Places
PREIAP	Pre-Environmental Impact Analysis Process
PTC	Pilot Training Center
R-/RA	Restricted Area
SHPO	State Historic Preservation Officer
SPL	Sound Pressure Level
SUA	Special Use Airspace
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VFR	Visual Flight Rules
VR	Visual Flight Rules Military Training Route

Chapter 1. Purpose of and Need for Action

The National Guard Bureau (NGB) and the Michigan Air National Guard (MIANG) are preparing an Environmental Assessment (EA) to consider the potential consequences to the human and natural environment associated with modification, expansion, and utilization of the Alpena Special Use Airspace (SUA) Complex. The Proposed Action would meet current and emerging training needs and optimize effective use of available airspace structure.

NGB is the proponent of this proposal and the lead agency for preparation of the EA. The Federal Aviation Administration (FAA) has been charged by Congress with administering all navigable airspace in the public interest, as necessary, to ensure the safety of aircraft and the efficient use of airspace. As a result, NGB has requested that the FAA serve as a cooperating agency for this EA. NGB is preparing this EA in accordance with the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500–1508, as revised), Department of the Air Force's (DAF) Environmental Impact Analysis Process (EIAP; 32 CFR 989), FAA's Environmental Impacts: Policies and Procedures (FAA Order 1050.1F), and FAA's Procedures for Handling Airspace Matters (FAA Joint Order [JO] 7400.2N). The EA will inform decision makers of the potential consequences resulting from implementation of the Proposed Action, alternatives, and the No Action Alternative.

Per amendments to 10 United States Code 10501, described in Department of Defense (DOD) Directive 5105.77, the NGB is a joint activity of the DOD. NGB serves as a channel of communication and funding between the DAF and State Air National Guard (ANG) organizations in the 54 U.S states, territories, and the District of Columbia. The National Guard Bureau Air Directorate (NGB-CF) oversees the NEPA process for ANG facilities, as required under NEPA, CEQ Regulations, and 32 CFR 989.

1.1 Location and Background

The Alpena Combat Readiness Training Center (CRTC) is located at the Alpena County Regional Airport in Alpena, Michigan (see Figure 1-1). The CRTC schedules and hosts local, regional, and deployed unit training exercises within the existing Alpena SUA Complex (see Mission & Vision statements, right). The Alpena SUA Complex is over part of Lake Huron and all or parts of the following Michigan counties: Alcona, Alpena, Arenac, Cheboygan, Crawford, Huron, Iosco, Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon, Sanilac, and Tuscola. Alpena SUA is shown in Figure 1-1 through Figure 1-3.

Alpena CRTC Mission

The Alpena CRTC provides premier support, facilities, instruction, and airspace to Department of Defense, Department of Homeland Security, Coalition, and emergency responders to meet mission requirements of Combatant Commanders and Civil Authorities

Alpena CRTC Vision

The Alpena CRTC aspires to be the premier Air National Guard training environment providing unparalleled mission support, facilities, and equipment to all who pass through our gates or airspace.

(Alpena CRTC, 2021)

Figure 1-1 Location of Alpena Combat Readiness Training Center and Extent of Existing Alpena Special Use Airspace Complex

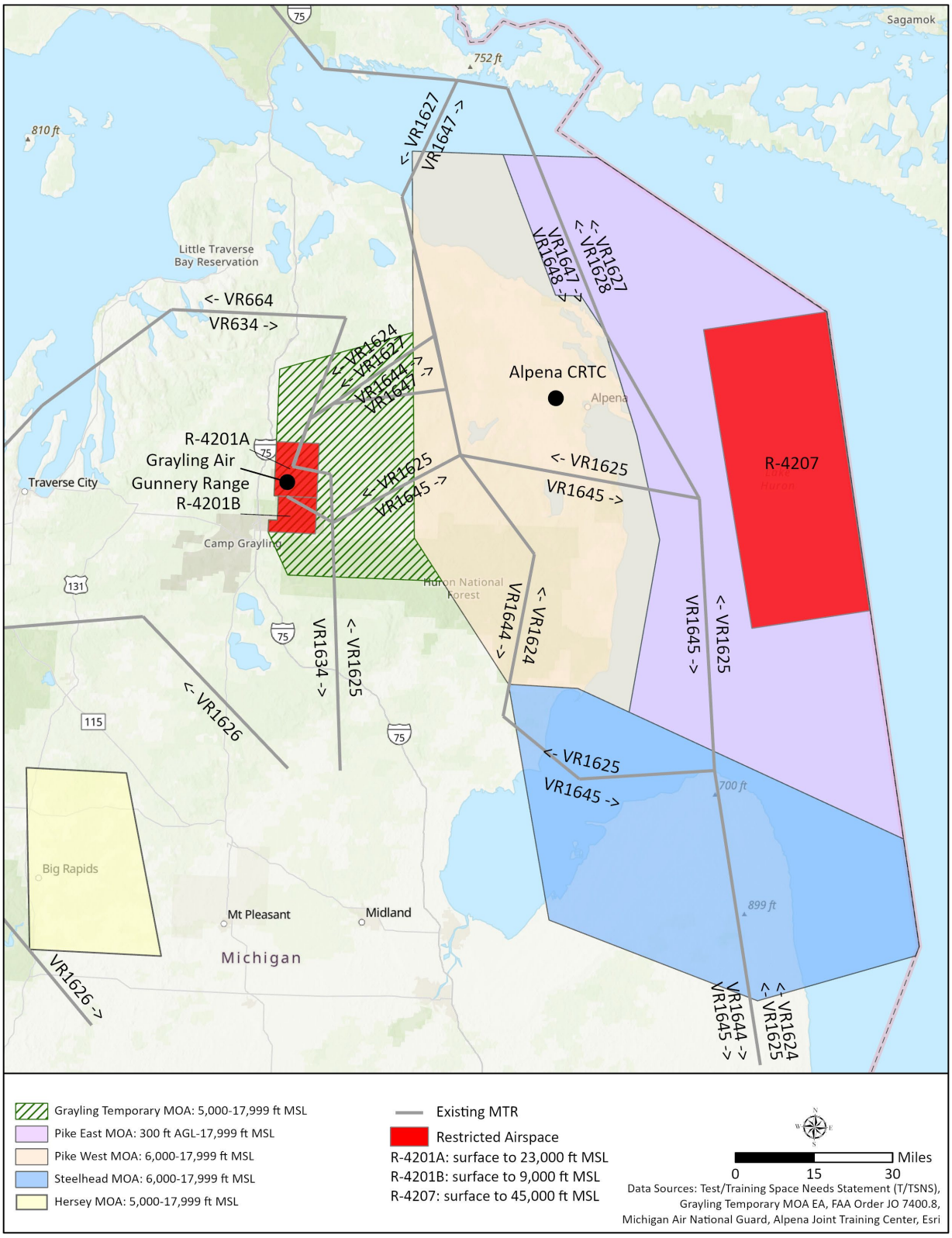


Figure 1-2 Three-Dimensional Renderings of Existing Alpena Special Use Airspace Complex

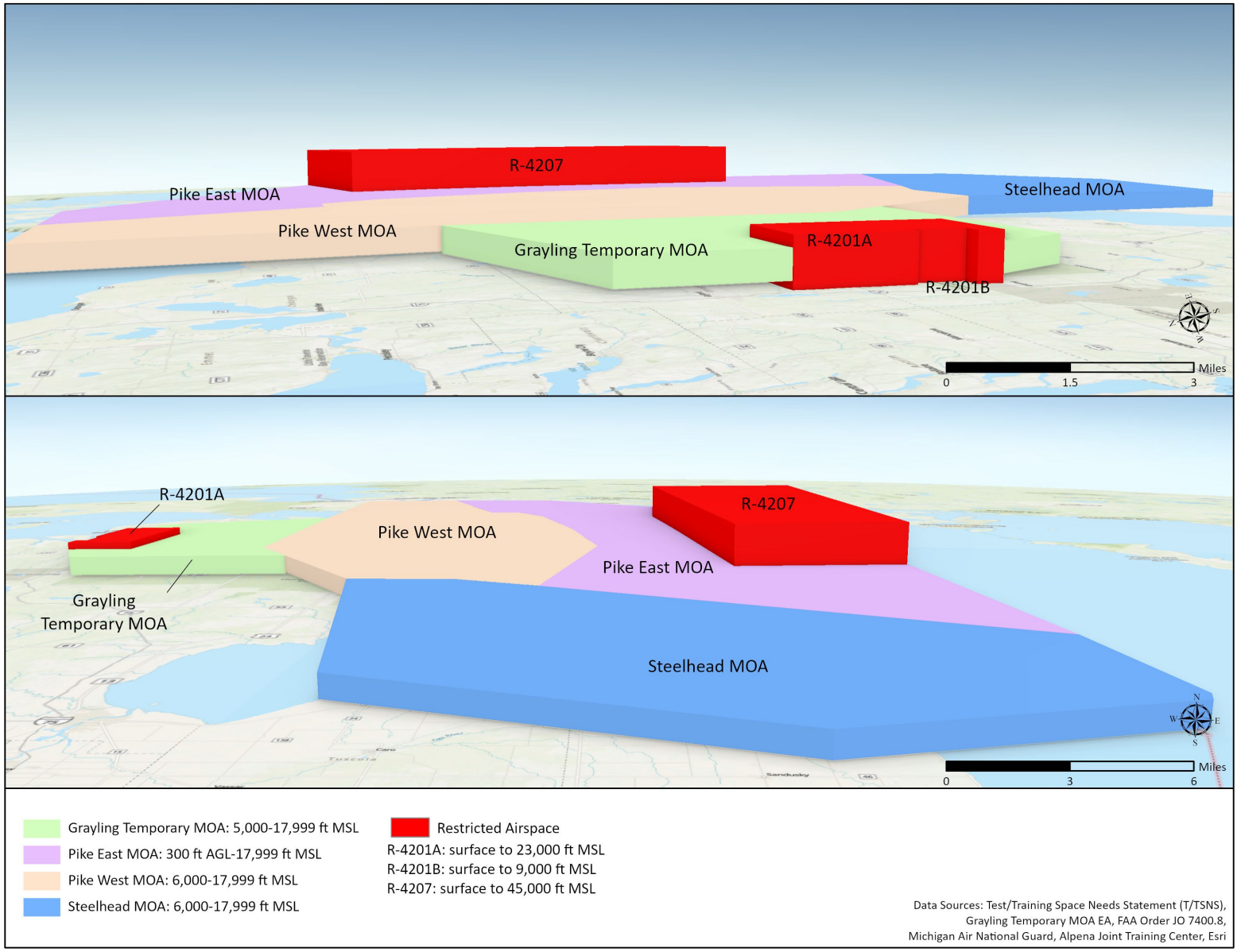
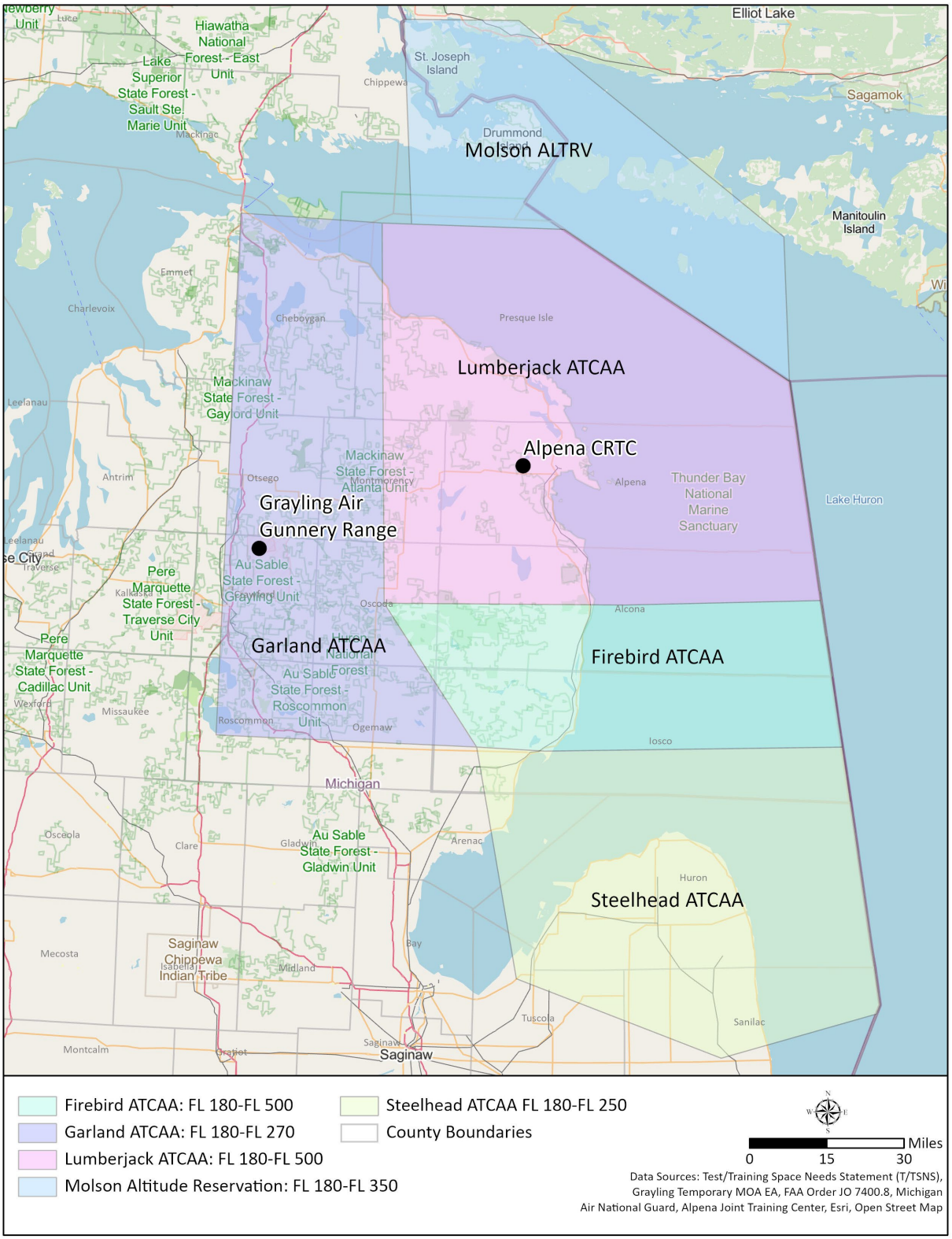


Figure 1-3 Extent of Existing Air Traffic Control Assigned Airspace and Altitude Reservation Segments



Note: A Letter of Agreement is under coordination that raises the ceilings for the Lumberjack and Firebird ATCAAs to Flight Level 500. This change is independent of the Proposed Action and considered part of the existing condition in this EA.

Airspace Definitions Used in this Environmental Assessment

Special Use Airspace—SUA—consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. The types of SUA are **military operations areas (MOAs)**, **restricted areas (RAs)**, warning areas, prohibited areas, alert areas, controlled firing areas, and national security areas. This project involves MOAs and RAs.

Military operations areas—MOAs—are defined airspace areas established below 17,999 feet above mean sea level to segregate high-performance military aircraft conducting training activities from nonparticipating civil and military air traffic operating under **Instrument Flight Rules (IFR)**. Nonparticipating military and civilian aircraft flying under **Visual Flight Rules (VFR)** can operate in MOAs without approval from the military scheduling or controlling agency; however, extreme caution is advised when such aircraft transit active MOAs to ensure flight safety.

Restricted areas—RAs—typically overlie gunnery ranges. Nonparticipating aircraft are restricted from entering these areas because the activities taking place within them are considered hazardous to flight (for example, ordnance delivery or use of non-eye-safe lasers).

Military training routes—MTRs—are defined airspace established for low-altitude military flight training in excess of 250 knots. This project involves **VFR MTRs (VRs)** that are not flown under air traffic control.

Air traffic control assigned areas—ATCAAs—are defined airspace areas assigned by air traffic control to provide segregation between training activities conducted within the assigned airspace and nonparticipating IFR traffic. ATCAA altitudes are described in terms of Flight Level starting at 18,000 feet mean sea level, which is termed FL 180. No changes in ATCAAs are proposed with this project.

Figure 1-1 and Figure 1-2 show the existing Military Operations Areas (MOAs) within the Alpena SUA Complex and Restricted Areas (RAs) associated with the Grayling Air Gunnery Range ("Grayling Range"). The existing SUA charted below Class A airspace, which begins at 18,000 feet above mean sea level (MSL), includes Pike East MOA, Pike West MOA, and Steelhead MOA, as well as Hersey MOA to the south that can be used as a weather alternate. Existing SUA with an operational floor below 500 feet above ground level (AGL) includes R-4201A/B surrounding Grayling Range, and R-4207 and Pike East MOA over part of Lake Huron. Other than R-4201A/B, there is no overland SUA with an operational floor below 500 feet AGL in the Alpena SUA Complex; therefore, all current overland low-altitude training in the region is concentrated at this location.

Grayling Temporary MOA [1] is requested for annual activation during large force exercises (LFEs); as a temporary MOA, it is uncharted. In addition, the Alpena SUA Complex includes four air traffic control assigned airspace (ATCAA) segments (Lumberjack, Firebird, Steelhead, and Garland) and one altitude reservation (ALTRV) segment (Molson), as shown in Figure 1-3. These begin at 18,000 feet MSL, which is more commonly referred to as Flight Level (FL) 180, and rise to different altitudes, depending on the designated use. R-4201A/Grayling Range is the primary training range for the local units and visiting units that regularly access Alpena CRTC. Current military training routes (MTRs) within and adjacent to the Alpena SUA Complex are shown in Figure 1-1.

[1] The EA for the establishment of the Grayling Temporary MOA (MIANG, 2019a) assessed the airspace floor at 5,000 feet MSL for the temporary MOA, and so this is the floor used in this EA. However, the floor of the Grayling Temporary MOA may vary year to year as required by the Air Route Traffic Control Center, which has restricted floors to higher than 5,000 feet MSL in recent years. Use of the Grayling Temporary MOA must be requested annually.

The 180th Fighter Wing (180 FW), flying F-16 aircraft out of Toledo Air National Guard Base (ANGB), and the 127th Wing (127 WG), flying A-10C and KC-135 tankers out of Selfridge ANGB, use the Alpena SUA Complex and Grayling Range on a regular basis. In addition, Alpena CRTC hosts multiple air-to-air and air-to-ground LFEs each year, with aircraft and ground support elements participating from multiple Services across the United States and allied nations. Scheduled aircraft include fighters, bombers, tankers, tactical airlift, strategic airlift, command and control platforms, helicopters, and unmanned aircraft systems. The primary users would conduct exercises with A-10 and F-16 aircraft. NGB seeks to modify airspace and training infrastructure to meet the current and evolving training needs of the hosting, visiting, or deployed units that use the Alpena SUA Complex and Grayling Range.

The Alpena SUA was originally created over 50 years ago to accomplish warfighter training during the Korean and Vietnam War eras. The current airspace is too small for twenty-first century tactics. In late 2018, NGB initiated preparation of an EA for modifying airspace. As of December 2019, that EA was put on hold due to coordination and planning associated with changes in the sizes and shapes of proposed airspaces. This EA carries forward a similar but updated purpose, need, and Proposed Action (see Section 2.1).

1.2 Purpose

The purpose of the Proposed Action is to amend and establish Alpena CRTC's SUA supporting military readiness requirements that would contribute to the overall provision of an integrated, year-round, realistic training environment. The proposed modifications and additions to the Alpena SUA Complex are designed to meet current and emerging training requirements and contribute to the most efficient use of the airspace structure.

1.3 Need

The Director of the ANG has approved a plan to transform Alpena CRTC into the ANG's Close Air Support Center of Excellence. To meet this emerging restructuring, the airspace must be of sufficient, contiguous size and altitude to accommodate Low Altitude Step Down Training (LASDT) and Low Altitude Air-to-Air Training (LOWAT) tactics and standoff weapons employment, and to support ANG Instruction 10-110. The Alpena CRTC airspace must also be capable of satisfying the training requirements of fifth-generation fighters, such as the F-22 and F-35, as these assets are programmed for employment by the DAF.

Specific readiness requirements associated with modifications and additions to the Alpena SUA Complex are discussed in the following paragraphs. Refer to Section 2.1 for information detailing the Proposed Action, including airspace figures showing locations.

Reference Guidance

Mission Design Series guidance is aircraft specific. Relevant references include the following:

- Air Force Instruction 11-2F-16, Volume 1
- Air Force Instruction 11-2A-10, Volume 1
- Air Force Instruction 3-1.A10
- Air Force Technical Training Publication 3-1 (addressing F-16 training requirements)

Overarching regulatory guidance is also applicable, including the following:

- Air Operations Rules and Procedures (Air Force Instruction 11-214)
- Flight Operations (Air Force Manual 11-202, Volume 3)

Proposed Grayling East/West MOAs. R-4201A is seven nautical miles by nine nautical miles, and R-4201B is six nautical miles by six nautical miles. Even combined (i.e., 99 square nautical miles), they are too small for modern combat tactics. There is currently a 15 nautical mile gap between R-4201 and the closest permanent SUA, Pike West MOA. The Grayling MOAs would allow aircraft to initiate training maneuvers from within a SUA at tactically sound altitudes, and transition into R-4201A/B safely, to fully accomplish their training maneuvers without a false interruption. The Grayling MOAs would be used in conjunction with R-4201, Pike West MOA, Pike East MOA, Steelhead MOA, and overtopping ATCAAs to approximate the SUA volume requirements for complex missions.

The Grayling Temporary MOA has been an integral part of Alpena CRTC's annual exercises such as Northern Strike, Agile Rage, and Mobility Guardian. The Grayling Temporary MOA has been in use for the past ten years with no significant impact on nonparticipating users of the National Airspace System (NAS) or on local communities underneath the charted airspace. Alpena CRTC actively maintains a noise complaint hotline for community members. Recommendations from a Joint Land Use Study were also implemented two years ago that have helped to mitigate noise complaints. The need for the Grayling Temporary MOA would continue on a regular and continuing basis into the future, so it is appropriate to consider permanently charting it, per FAA JO 7400.2N, paragraph 25-1-7.b.

R-4201B Modifications. R-4201B has a ceiling of 9,000 feet MSL, while R-4201A has a ceiling of 23,000 feet MSL that is contiguous with the overtopping Garland ATCAA. This leaves a gap of airspace above 9,000 feet MSL over the top of R-4201B that is unavailable for military training, affecting approximately half of all sorties to Grayling Range. The "shelf" effect of the current configuration greatly detracts from realistic training by diverting aircrew focus to remaining within an artificially small volume of airspace. Closing this gap of airspace by raising the ceiling of R-4201B to 23,000 feet MSL would accommodate longer standoff distances while using the combat laser of advanced targeting pods. It would also accommodate longer release ranges of actual training ordnance, in keeping with current Precision Guided Munitions tactics, which generally occur high above 9,000 feet MSL. Laser and weapons employment, which are inherently hazardous activities, require restricted airspace and cannot be accommodated within MOA airspace.

Special Use Airspace Volume Requirements

Minimum airspace requirements for the F-16 to conduct Defensive Counter Air missions are laterally 50 nautical miles by 100 nautical miles at altitudes from 500 feet above ground level to Flight Level 500.

Fifth generation fighters that use the Alpena Complex have similar airspace volume requirements.

(MIANG, 2019b)

Standoff Tactics Requirements

Most combat aircraft that use Grayling Range carry Advanced Targeting Pod systems for Air-to-Ground Precision Guided Munition deliveries. The large standoff ranges of Precision Guided Munitions fielded in the 1980s–1990s and more recently, and technological capabilities of targeting pods require employment starting from distances that exceed the restricted area boundaries of Grayling Range. This requires a MOA surrounding Grayling Range to contain the non-hazardous portion of the target acquisition and weapons delivery.

Grayling Range has the only Precision Guided Munitions impact area with the ability to drop both Laser Guided Bombs and Joint-Direct Attack Munitions within 250 nautical miles of Alpena CRTC.

(MIANG, 2019b)

Proposed Steelhead Low North/South/East MOAs. The Steelhead Low North, South, and East MOAs are needed to create low-altitude training airspace closer to Selfridge ANGB and Toledo ANGB. The Steelhead Low MOAs would be 100 nautical miles closer to both bases than the Grayling Range. The Steelhead Low MOAs would be used both in conjunction with other proposed airspace and individually during less complex missions. In addition, low MOAs are essential for effective training when escorting rescue vehicles to conduct search operations.

Low-Altitude Training Requirements

Both the 180 FW and 127 WG, as well as most flying units deploying to the Alpena CRTC, have a Ready Aircrew Program requirement for Low Altitude Step Down Training and Low Altitude Air-to-Air Training. Both types of training must occur below 5,000 feet above ground level. The A-10 and F-16 have varying low-altitude certifications down to 100 feet AGL.

The only current "low" airspace is Grayling Range, which is too small, and the Pike East MOA, which is over water. While overwater low airspace is useful, it must be matched by overland low airspace to provide low-level training opportunities when Great Lake environmental conditions prohibit overwater flights.

(MIANG, 2019b)

Steelhead, Pike West, and Pike East MOAs Modifications. A 2012 redesign of the Alpena SUA Complex ATCAAs resulted in the Steelhead ATCAA northern border moving north, breaking integrity with the Steelhead MOA northern border. It was moved to accommodate new high-altitude routes over the top of the ATCAA and to preserve the higher altitude Firebird ATCAA to the north of the Steelhead ATCAA. High-low border disconnects have caused aircrew confusion and distraction from primary training objectives. Adjusting lateral MOA boundaries internal to the Alpena SUA Complex to better align with ATCAA boundaries above would fix this disconnect.

Proposed VR-1601/VR-1602 (reciprocal). Both the 180 FW and 127 WG, as well as most flying units deploying to the Alpena CRTC, have a Ready Aircrew Program requirement for LOWAT and LASDT. Both types of training must occur below 5,000 feet AGL. R-4201A is the primary training range for the units listed above, and for visiting units at Alpena CRTC. There are currently eight MTRs that access R-4201A/Grayling Range from the Alpena CRTC. Four of these routes are reciprocal (i.e., it is the same route flown in the opposite direction); therefore, there are only four options to fly into R-4201A/Grayling Range. During Exercise Northern Strike and the National Guard summer training cycle, there is an increase in the amount of military helicopter traffic between Alpena CRTC and Camp Grayling on approved Army routes to both the north and south of R-4201A. This, in effect, turns off the MTR option for fixed-wing aircraft to ingress and egress the range at low altitudes during the prime training months of July and August. The proposed MTRs—both Visual Flight Rules (VFR) MTRs, or VRs, designated as VR-1601 (to Grayling Range from Alpena CRTC) and VR-1602 (reciprocal, to Alpena CRTC from Grayling Range)—would allow for military deconfliction between fixed-wing and rotary-wing aircraft during LFEs.

1.4 Project Objectives

To optimize airspace and meet the current ANG training requirements, the Proposed Action must achieve the following objectives for SUAs:

- provide a variety of low-altitude, overland SUA to accommodate restrictive weather variations and cloud cover interference

- provide connecting airspace from the existing SUA complex to the Grayling Range Restricted Airspace for safe training continuity
- provide useful, appropriately sized low-altitude airspace closer than the Grayling Range, which would decrease in-flight time and fuel usage

1.5 Laws, Regulations, and Executive Orders

NEPA (42 United States Code [USC] 4321 et seq.) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before action is taken. The CEQ, which was established under NEPA, is charged with developing and implementing regulations and ensuring federal agency compliance with NEPA. The process for implementing NEPA is codified in Title 40 CFR Parts 1500–1508, as revised in July 2020 and April 2022.

The EIAP is the DAF implementing regulations for conducting environmental analyses, as promulgated at 32 CFR 989. To comply with NEPA, CEQ regulations and the EIAP are used together. NGB is the decision maker in this EA, but the FAA has final authority for approving or denying any proposal to modify, expand, or establish SUA and MTRs. Therefore, the EA must also be consistent with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, and FAA JO 7400.2N, Procedures for Handling Airspace Matters.

The full suite of applicable environmental laws, regulations, and executive orders is included in Appendix A (refer to Table A-1 and Table A-2).

1.6 Lead and Cooperating Agencies

NGB is the lead agency for this EA pursuant to 40 CFR 1501.7. Since the Proposed Action includes activities associated with SUA, the FAA is a cooperating agency in accordance with the guidelines described in the Memorandum of Understanding between the FAA and the DOD concerning SUA Environmental Actions, dated October 17, 2019 (FAA JO 7400.2N, Appendix 7, FAA/DOD Memorandum of Understanding).

1.7 Interagency and Intergovernmental Coordination for Environmental Planning and Public InvolvementProcess

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) is a DAF process used to implement scoping and interagency review requirements. During the IICEP process, the NGB notified relevant federal, state, and local agencies on June 17, 2021, and provided at least 30 days to identify any potential environmental concerns regarding the specific Proposed Action. IICEP responses were received from the Nottawaseppi Huron Band of the Potawatomi (June 24, 2021), Michigan Department of Natural Resources (MDNR; July 15, 2021), the Aircraft Owners and Pilots Association (July 22, 2021), and U.S. Representative Jack Bergman (July 30, 2021). All IICEP materials, including letters, mailing lists, and responses, are in Appendix B.

NGB will continue government-to-government consultation with federally recognized tribes in accordance with Section 106 of the National Historic Preservation Act (NHPA). Other consulting parties will include the Michigan State Historic Preservation Officer (SHPO), U.S. Fish and Wildlife Service (USFWS) pursuant to the Endangered Species Act, and Michigan Department of Environment, Great Lakes, and Energy (EGLE) pursuant to the Coastal Zone Management Act. Early

coordination correspondences from the SHPO (August 27, 2021) and USFWS (September 27, 2021) are also in Appendix B. Appendix C contains coastal zone coordination, Appendix D contains USFWS coordination, and Appendix E contains Section 106 consultation.

Pursuant to 40 CFR 1501.6(a)(2) 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 Proposed Action. A Notice of Availability for the public review of the Draft EA was published in the following newspapers:

- *The Alpena News*
- *Huron Daily Tribune*
- *Crawford County Avalanche*
- *Gaylord Herald Times*

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

- Alpena County George N. Fletcher Public Library
- Devereaux Memorial Library (Main Branch, Crawford County Library)
- Rogers City Library (Presque Isle District Library)
- Atlanta Branch – Headquarters (Montmorency County Public Libraries)
- Hillman-Wright Branch (Montmorency County Public Libraries)
- Robert J. Parks Library (Oscoda Township Public Library)
- Bad Axe Area District Library
- Port Austin Township Library
- Harbor Beach Public Library
- Sebewaing Township Library
- Harrisville Branch (Alcona County Library Headquarters)
- Tawas City Library
- Otsego County Main Library

The Draft EA and unsigned FONSI were made available and distributed upon request to federal, state, and local agencies, as well as regional libraries and other interested parties, to invite public participation. The Draft EA and unsigned FONSI are available electronically at https://www.alpenacrtc.ang.af.mil/. Draft EA review materials are included in Appendix F.

1.8 Resources Carried Forward for Detailed Analysis

After preliminary analyses of potential resource issues, as prescribed by FAA Order 1050.1F and other NGB pre-EIAP (often called "PREIAP") requirements, the following resource areas will be carried forward for further analysis in the EA due to the potential for reasonably foreseeable effects: airspace management, safety, air quality, noise, land use, water resources including coastal resources, biological resources, cultural resources, and socioeconomics and environmental justice.

As this is a streamlined EA consistent with CEQ's regulations to limit overall pages (40 CFR 1501.5(f) and 40 CFR 1508(v)), information about how resources were initially considered and supporting documentation for why resources were eliminated from detailed evaluation are in Appendix A (i.e., Section 4(f) of the Department of Transportation Act, geological resources, infrastructure and transportation, visual resources, and hazardous materials and wastes).

Chapter 2. Description of the Proposed Action and Alternatives

2.1 Proposed Action (Alternative A): Alpena Airspace Modification and Addition

To optimize airspace and address training limitations presented by the existing configuration of the Alpena SUA Complex, NGB proposes to modify and expand the existing airspace complex (see also the discussion on the range of reasonable alternatives considered in Section 2.5). The Proposed Action would include the following:

- establish five new MOAs (Grayling East, Grayling West, Steelhead Low North, Steelhead Low South, and Steelhead Low East)
- discontinue the annual request for the Grayling Temporary MOA
- modify the internal lateral boundaries of three existing MOAs (Pike East, Pike West, and Steelhead)
- return the Hersey MOA to the NAS
- raise the vertical ceiling of R-4201B
- establish two new MTRs (VR-1601 and VR-1602)

Numerous DOD Services would use the proposed airspace improvements; however, the 180 FW out of Toledo ANGB and 127 WG out of Selfridge ANGB would continue to routinely use the airspace complex. The Proposed Action would not include any near-term changes to the existing fleet mix of aircraft or scheduling of Alpena CRTC; any such changes in aircraft or scheduling would be addressed in separate environmental documentation. No construction or ground-disturbing activities are proposed as part of this action.

The following measures would be incorporated into the Proposed Action upon implementation. These measures were developed through previous environmental scoping and review efforts to reduce potential impacts:

- In the Steelhead Low MOAs, participating aircraft would be restricted to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline only between May 15 and September 15.
- No F-35 aircraft would be allowed in the Steelhead Low North, South, and East MOAs. This measure was added in response to early public scoping efforts.
- The shape and altitude of the Steelhead Low South MOA has been designed to enable civil flight operations around Huron County Memorial Airport without entering military airspace.
- The airspace legal description requirement would include that the airspace must be activated by Notice to Airmen (NOTAM) at least four hours in advance.
- The MIANG would enter into a Letter of Agreement (LOA) with Minneapolis Center and Cleveland Center to establish procedures for real-time separation and use of the airspace to allow civilian Instrument Flight Rules (IFR) aircraft access through the MOAs.

The affected airspace areas associated with this Proposed Action are shown in Figure 2-1, with three-dimensional renderings shown in Figure 2-2. The individual descriptions for each of this project's parts are discussed in more detail in the following subsections. Further specific details of proposed charted airspace descriptions are included in Appendix G.

Figure 2-1 Proposed Modifications to Alpena Special Use Airspace Complex

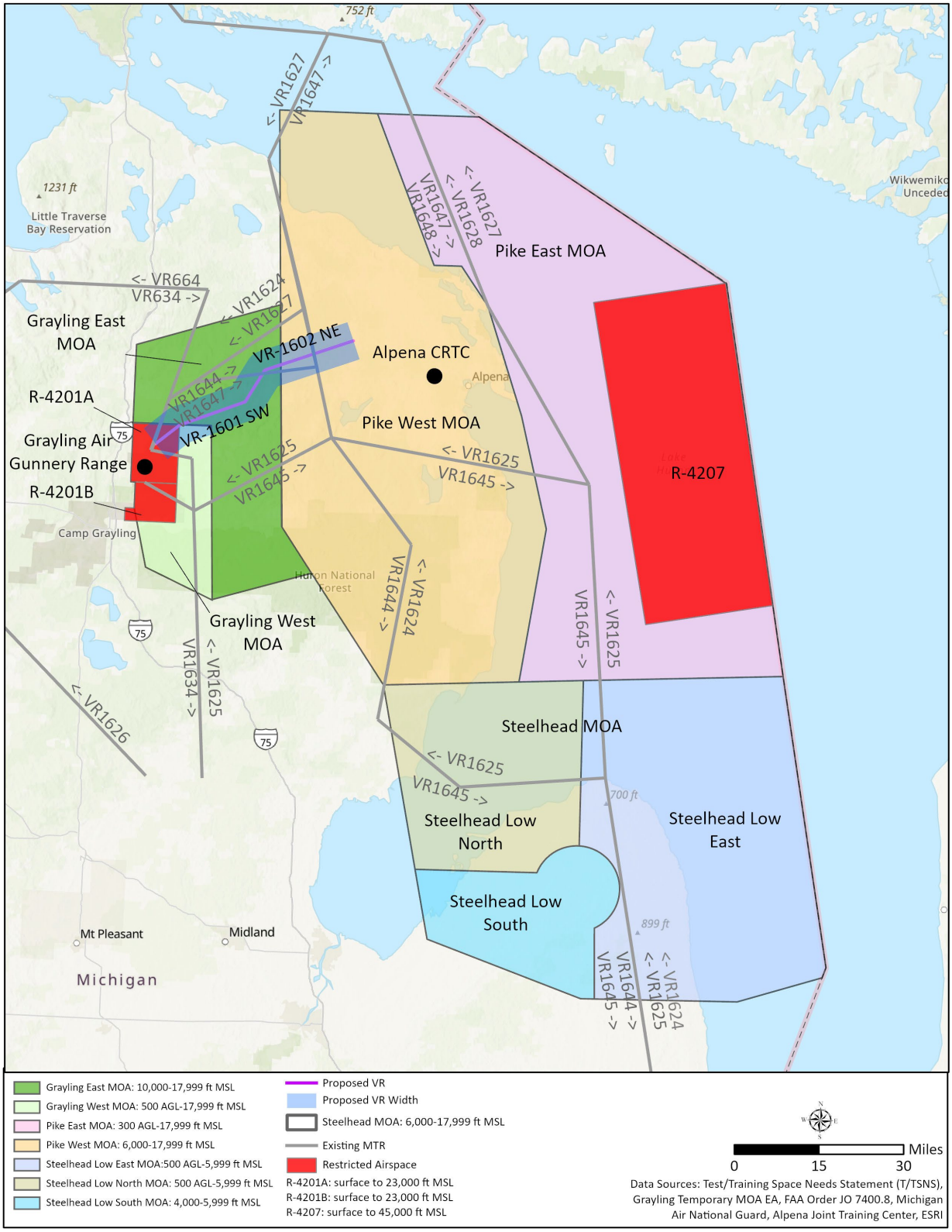
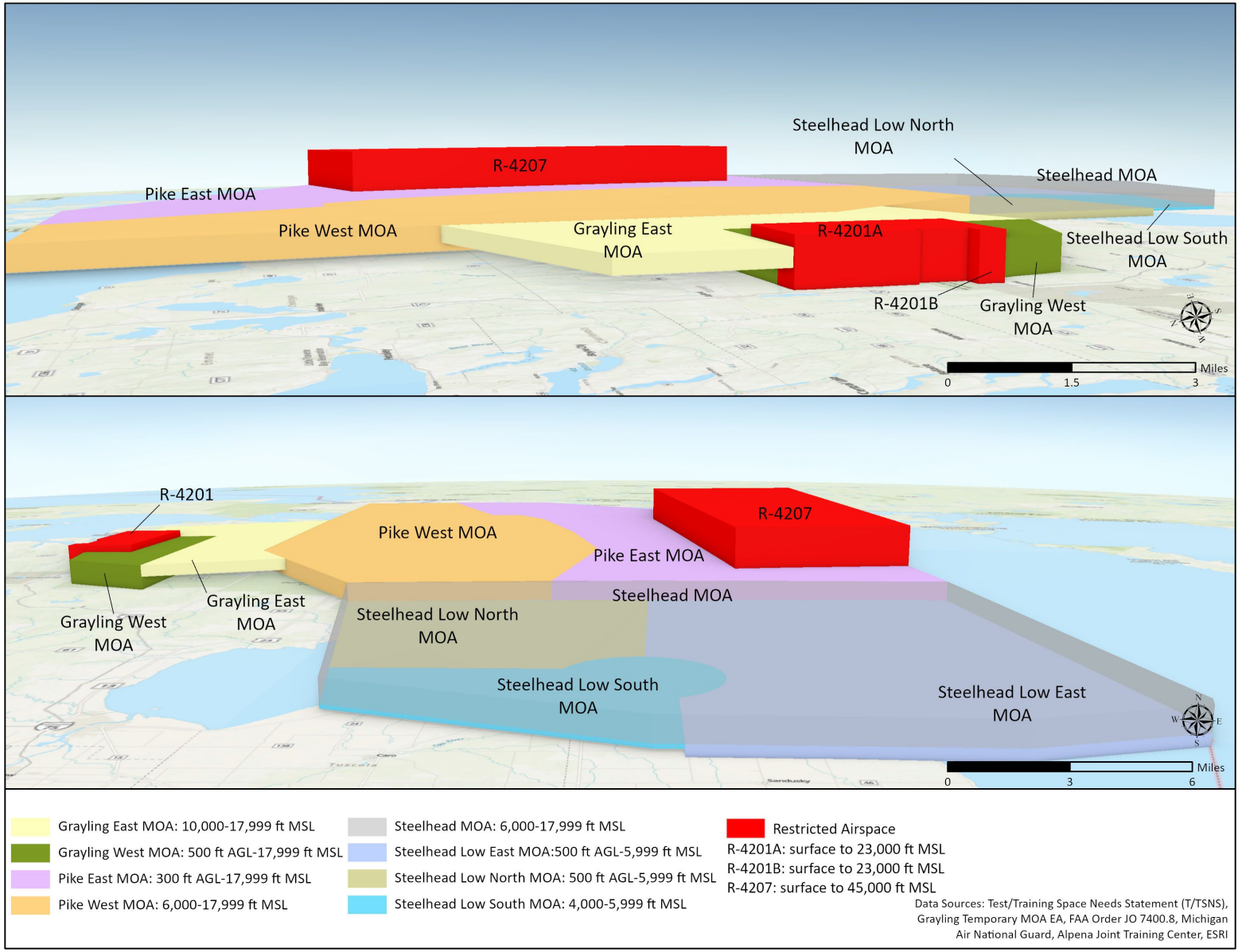


Figure 2-2 Three-Dimensional Renderings of Proposed Modifications to Alpena Special Use Airspace Complex



2.1.1 Military Operations Areas

Operational activities would consist of typical MOA flight operations, to include tactical combat maneuvering by fixed-wing and rotary-wing aircraft involving abrupt, unpredictable changes in altitude, and direction of flight. Other operational activities may include non-standard formation flights, close air support, electronic attack, and chaff and flare deployment (see Section 2.1.4 and Appendix H). There would be no supersonic flight activities, no weapons firing, and no ordnance deployment within the MOAs. The primary users would conduct exercises with A-10 and F-16 aircraft. Transient users would conduct exercises with a wide variety of military and fixed-wing aircraft and rotorcraft.

Discontinue Annual Request for Grayling Temporary MOA

The Grayling Temporary MOA has designated altitudes of 5,000 feet MSL to 17,999 feet MSL and a total area of 869 square nautical miles. As a temporary MOA, training normally occurs for only two weeks per year. With the implementation of the Grayling West MOA and Grayling East MOA, the request for the Grayling Temporary MOA would discontinue. The training objectives for exercises that are currently being met in the Grayling Temporary MOA would be fulfilled using the Grayling West and East MOAs.

Establishment of Grayling West MOA

The Grayling West MOA (283 square nautical miles; 375 square miles) would be established around the eastern and southern boundaries of R-4201A/B, sharing the western Grayling Range boundary to accommodate IFR traffic transiting west of the airspace. Details of the proposed Grayling West MOA are shown in Table 2-1.

Establishment of Grayling East MOA

The Grayling East MOA (635 square nautical miles; 841 square miles) would be established north and east of the proposed Grayling West MOA boundaries and adjoining the western boundary of the Pike West MOA. Details of the proposed Grayling East MOA are shown in Table 2-1.

Table 2-1 Proposed Details of the Grayling West and East MOAs

Component	Grayling West MOA	Grayling East MOA
Designated Altitudes	500 feet AGL to 17,999 feet MSL	10,000 feet MSL to 17,999 feet MSL
Times of Use	Intermittent by NOTAM four hours in advance Normally Monday–Friday, 0900–1130 and 1300–1530	Intermittent by NOTAM four hours in advance Normally Monday–Friday, 0900–1130 and 1300–1530
Area	283 square nautical miles	635 square nautical miles

(MIANG, 2019b)

Note: Intermittent means that airspace activation would not be automatically used continuously during the indicated times, but only if the military notified the public via a NOTAM.

Key: AGL = above ground level; MOA = Military Operations Area; MSL = mean sea level; NOTAM = Notice to Airmen.

Modification of Steelhead MOA

The Steelhead MOA would be modified so that the northern border would align to the Firebird/Steelhead ATCAA and the realigned Pike East and Pike West MOA southern boundaries. In addition, the southern tip of the Steelhead MOA would be truncated to align with the Steelhead ATCAA. No new SUA would be created laterally or vertically in this airspace region; only internal lateral boundaries would change (see Appendix G).

Establishment of Steelhead Low North MOA

The Steelhead Low North MOA would be created from the area removed from the southern end of Pike East MOA below 6,000 feet MSL, with its northern border aligned to the Firebird/Steelhead ATCAA and the new Pike East MOA southern boundary. Additional Steelhead Low North SUA airspace would be created under the existing Steelhead MOA. Proposed details are shown in Table 2-2. The proposed Steelhead Low North MOA would include the following exclusions, which are incorporated to reduce potential impacts:

- No F-35 aircraft would be allowed in this MOA.
- Participating aircraft would be restricted to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline seasonally only between May 15 and September 15 (see Figure 2-3).

Establishment of Steelhead Low East MOA

The Steelhead Low East MOA would be created from the area removed from the southern end of Pike East MOA below 6,000 feet MSL, with its northern border aligned to the Firebird/Steelhead ATCAA and the realigned Pike East MOA southern boundary. Additional Steelhead Low East SUA airspace would be created under the existing Steelhead MOA. Proposed details are shown in Table 2-2. The proposed Steelhead Low East MOA would include the following exclusions, which are incorporated to reduce potential impacts:

- No F-35 aircraft would be allowed in this MOA.
- Participating aircraft would be restricted to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline seasonally only between May 15 and September 15 (see Figure 2-3).

Table 2-2 Proposed Details of the Steelhead Low North, South, and East MOAs

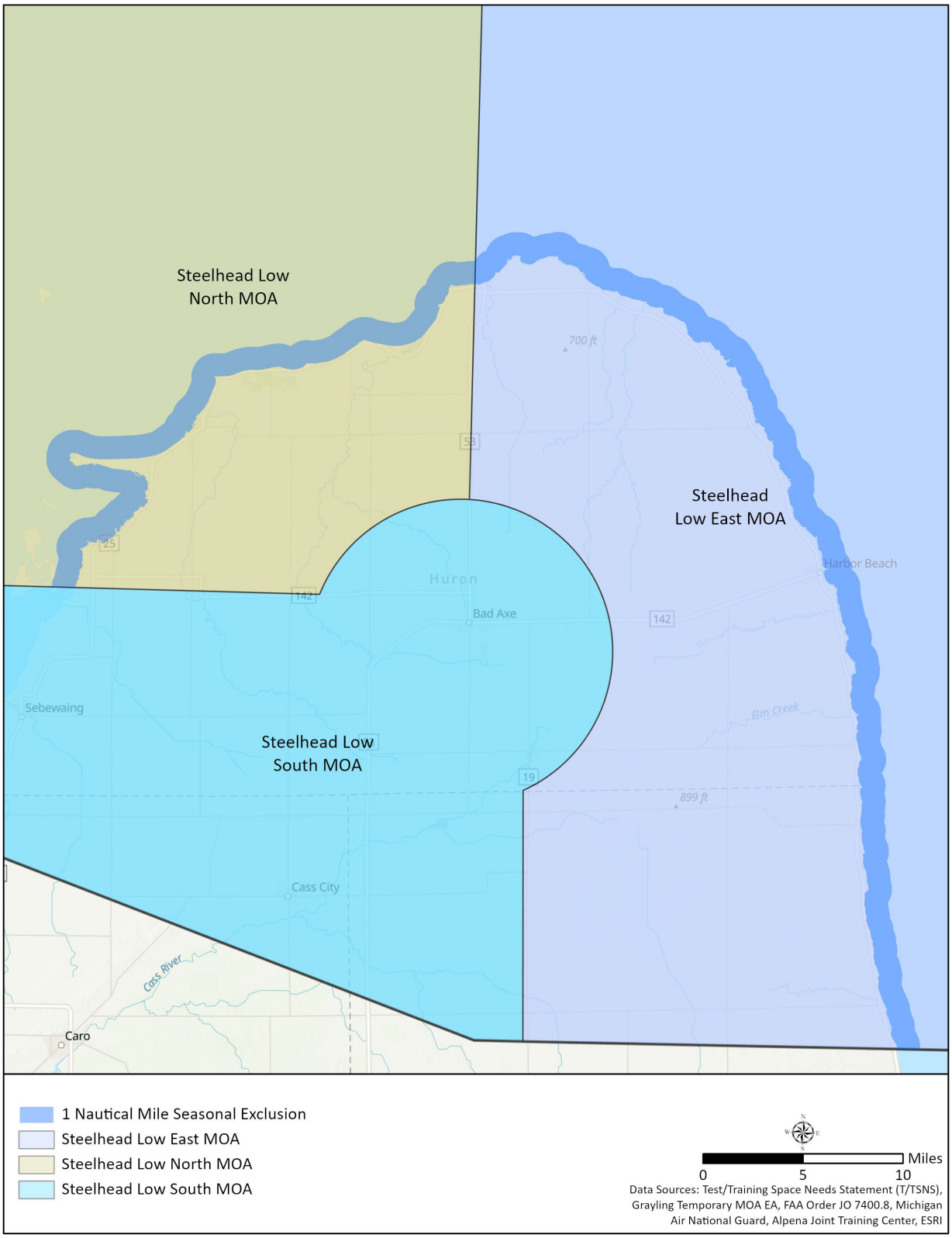
Component	Steelhead Low North MOA	Steelhead Low South MOA	Steelhead Low East MOA
Designated Altitudes	500 feet AGL to 5,999 feet MSL	4,000 feet MSL to 5,999 feet MSL	500 feet AGL to 5,999 feet MSL
Times of Use	Intermittent by NOTAM four hours in advance Normally Monday–Friday, 0900–1130 and 1300–1530	Intermittent by NOTAM four hours in advance Normally Monday–Friday, 0900–1130 and 1300–1530	Intermittent by NOTAM four hours in advance Normally Monday–Friday, 0900–1130 and 1300–1530
Area	792 square nautical miles	458 square nautical miles	1,620 square nautical miles

(MIANG, 2019b)

Note: Intermittent means that airspace activation would not be automatically used continuously during the indicated times, but only if the military notified the public via a NOTAM.

Key: AGL = above ground level; MOA = Military Operations Area; MSL = mean sea level; NOTAM = Notice to Airmen.

Figure 2-3 Steelhead Low North and East MOAs Seasonal Exclusions



Establishment of Steelhead Low South MOA

The Steelhead Low South MOA would be created under the existing Steelhead MOA. Proposed details are shown in Table 2-2. The shape and altitude of Steelhead Low South MOA were designed to enable civil flight operations around Huron County Memorial Airport without entering military airspace. The proposed Steelhead Low South MOA would also exclude F-35 aircraft.

Modification of Pike West MOA

The southern border would be straightened, aligned with ATCAA boundaries above, and shifted slightly north in accordance with the Steelhead MOA. No new SUA would be created laterally or vertically in this airspace; only internal lateral boundaries would change (see Appendix G).

Modification of Pike East MOA

The southern border would be straightened, aligned with ATCAA boundaries above, and shifted north in accordance with the Steelhead Low North and Steelhead Low East MOAs. No new SUA would be created laterally or vertically in this airspace; only internal lateral boundaries would change (see Appendix G).

Return Hersey MOA to NAS

The Hersey MOA has designated altitudes of 5,000 feet MSL to 17,999 feet MSL and a total area of 578 square nautical miles. The Hersey MOA, located west of the Steelhead MOA, would be returned to the NAS under the Proposed Action. The Hersey MOA is farther away from the other MOAs in the Alpena SUA Complex and is only used as an alternative when the weather to the north and east of the Hersey MOA is unfavorable. The Hersey MOA is not well suited for current tactics, techniques, or procedures and does not function well as a weather alternate.

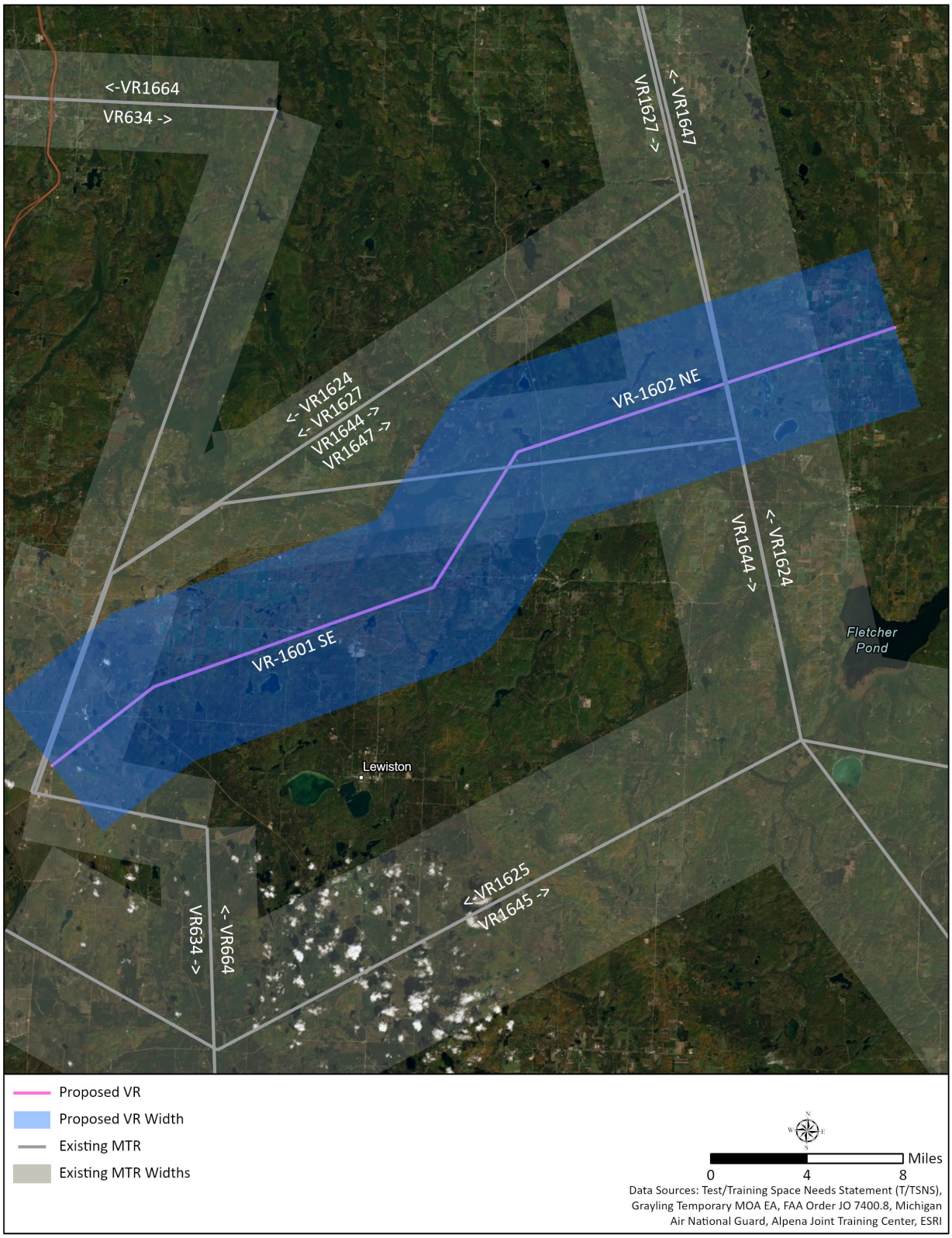
2.1.2 Restricted Areas

The R-4201B airspace ceiling would be raised from 9,000 feet MSL to 23,000 feet MSL, matching that of R-4201A. No lateral changes are proposed.

2.1.3 Military Training Routes

As shown in Figure 1-1, numerous VRs are within and adjacent to the Alpena SUA, including VRs 634, 664, 1624, 1625, 1626, 1627, 1628, 1644, 1645, 1647, and 1648. The existing MTRs are located throughout the Alpena SUA Complex, with a higher concentration below the Grayling Temporary MOA adjacent to R-4201A/B. Eight of these existing MTRs are used to fly between R-4201A/Grayling Range and Alpena CRTC. However, four of these routes are reciprocal, which leaves four options between these two locations. Under the Proposed Action, two MTRs, one from Alpena CRTC towards Grayling Range, and a reciprocal route, would be established. These MTRs would be VRs—VR-1601 and VR-1602 (reciprocal)—on a fairly direct route from ten nautical miles west of Alpena CRTC southwest towards Grayling Range (shown on Figure 2-4). Each VR would be approximately four equal legs covering 36 nautical miles, charted at 300 feet to 1,500 feet AGL, three nautical miles on either side of the centerline. Under the Proposed Action, the existing MTRs would be located throughout the Alpena SUA Complex but would be concentrated within or below the proposed Grayling East and West MOAs. Hours of operation would be 0800–1630, Monday–Friday. Black Talon (i.e., the Alpena CRTC Operations) schedules and deconflicts all MTRs located within Michigan.

Figure 2-4 Proposed Military Training Routes



2.1.4 Sorties, Weapons, and Chaff and Flare Use

A summary of the existing and proposed sorties and annual hours within the MOAs, R-4201, and VRs are shown in Table 2-3. The sortie numbers and hours were obtained from Alpena CRTC, Selfridge ANGB, and Toledo ANGB and represent an average over a year (MIANG & OHANG, 2021). The proposed sortie numbers and hours are based on a conservative annual estimate from average operational data and the planned mission and would be flown after the Proposed Action is implemented. Some of the sorties would be conducted using multiple SUA together, such as Grayling West MOA and R-4201. The number of flying days in the SUA varies between 13 to 24 days per month, with a higher number of flying days at R-4201 and Steelhead MOA (22 to 24 days) and fewer flying days at Pike MOAs. Detailed baseline and proposed aircraft mix, sorties, time in airspace per sorties, and annual hours of usage are summarized by airspace in Table 2-4 through Table 2-16.

Overall, the existing Alpena SUA Complex has a total area of 11,042 square nautical miles, and the proposed Alpena SUA Complex would have a total area of 12,675 square nautical miles (which includes all the MOAs and RAs but not the ATCAAs). This provides an additional 1,633 square nautical miles of airspace below 17,999 feet MSL for training under the Proposed Action.

Air-to-ground weapon expenditures occur only in RAs; in the Alpena SUA Complex these expenditures regularly occur in R-4201. There are numerous targets and inert weapons that are used for training on an annual basis. The increase in sorties at R-4201B would not result in a corresponding increase in air-to-ground weapons expenditures as no additional expenditures would occur in R-4201B under the Proposed Action.

Table 2-3 Summary of Existing and Proposed Annual Sorties within the Alpena Special Use Airspace Complex

Airspace	Baseline Sorties	Baseline Hours	Proposed Sorties	Proposed Hours
Grayling West MOA	0	0	1,603	432
Grayling East MOA	0	0	1,528	265
Steelhead MOA	1,413	1,227	1,640	890
Steelhead Low North MOA	0	0	1,020	138
Steelhead Low South MOA	0	0	1,020	187
Steelhead Low East MOA	0	0	1,020	388
Pike West MOA	690	702	914	859
Pike East MOA	308	788	478	882
Hersey MOA	2	2	0	0
R-4201A	1,790	849	1,750	650
R-4201B	316	20	1,640	141
Grayling Temporary MOA	309	68	0	0
VR-1601 and VR-1602	0	0	234	52

(MIANG & OHANG, 2021)
Note: The sorties are not additive across airspace because the same aircraft sortie may affect more than one altitude block.
Key: MOA = Military Operations Area; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

Table 2-4 Proposed Annual Sorties and Time in New Grayling West MOA

Aircraft	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	55	20	75	30	37.5
A-10	1,190	0	1,190	10	198.3
F-16	50	30	80	30	40.0
F-16	13	5	18	5	1.5
B-2	5	0	5	30	2.5
B-52H	30	10	40	60	40.0
AV-8B	35	10	45	25	18.8
C-17	5	0	5	15	1.3
C-130	50	0	50	15	12.5
EA-18G	5	0	5	25	2.1
MC-12	0	5	5	60	5.0
MH-60	50	0	50	45	37.5
CH-47	25	0	25	60	25.0
AC-130	5	5	10	60	10.0
Total	**1,518**	**85**	**1,603**	**—**	**432**

(MIANG & OHANG, 2021)
Note: A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-5 Proposed Annual Sorties and Time in New Grayling East MOA

Aircraft	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	55	20	75	30	37.5
A-10	1,190	0	1,190	5	99.2
F-16	50	30	80	30	40.0
F-16	13	5	18	5	1.5
B-2	5	0	5	30	2.5
B-52H	30	10	40	60	40.0
AV-8B	35	10	45	25	18.8
C-17	5	0	5	15	1.3
C-130	50	0	50	15	12.5
EA-18G	5	0	5	25	2.1
MC-12	0	5	5	60	5.0
AC-130	5	5	10	30	5.0
Total	**1,443**	**85**	**1,528**	**—**	**265**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-6 Proposed Annual Sorties and Time in New Steelhead Low North MOA

Aircraft	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	140	40	180	15	45.0
A-10	690	0	690	5	57.5
AH-1	10	0	10	15	2.5
F-16	45	15	60	15	15.0
F-16	22	8	30	10	5.0
FA-18A	10	0	10	15	2.5
MH-60	40	0	40	15	10.0
Total	**957**	**63**	**1,020**	**—**	**138**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-7 Proposed Annual Sorties and Time in New Steelhead Low East MOA

Aircraft	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	140	40	180	45	135.0
A-10	690	0	690	15	172.5
AH-1	10	0	10	60	10.0
F-16	45	15	60	30	30.0
F-16	22	8	30	10	5.0
FA-18A	10	0	10	30	5.0
MH-60	40	0	40	45	30.0
Total	**957**	**63**	**1,020**	**—**	**388**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-8 Proposed Annual Sorties and Time in New Steelhead Low South MOA

Aircraft	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	140	40	180	15	45.0
A-10	690	0	690	10	115.0
AH-1	10	0	10	5	0.8
F-16	45	15	60	15	15.0
F-16	22	8	30	10	5.0
FA-18A	10	0	10	15	2.5
MH-60	40	0	40	5	3.3
Total	**957**	**63**	**1,020**	**—**	**187**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-9 Existing and Proposed Annual Sorties and Time in Steelhead MOA

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Time in Airspace per Sortie (Minutes)	Baseline Annual Time in Airspace (Hours)	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	130	46	176	44	127.6	140	40	180	30	90
A-10	560	0	560	60	560	690	0	690	30	345
B-2	8	0	8	30	4	10	10	20	15	5
B-52	5	0	5	90	7.5	15	5	20	15	5
F-16	44	0	44	90	66	45	15	60	30	30
F-16	395	132	527	25	219.5	383	127	510	10	85
FA-18A	8	0	8	60	8	10	0	10	30	5
KC-135	60	23	83	169	233.8	70	30	100	180	300
F-35	2	0	2	30	1	40	10	50	30	25
Total	**1,212**	**201**	**1,413**	**—**	**1,227**	**1,403**	**237**	**1,640**	**—**	**890**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-10 Existing and Proposed Annual Sorties and Time in Pike West MOA

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Time in Airspace per Sortie (Minutes)	Baseline Annual Time in Airspace (Hours)	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	80	10	90	85	127.5	80	30	110	90	165.0
B-52	30	10	40	100	66.7	40	20	60	100	100.0
B-2	1	0	1	105	1.8	5	0	5	100	8.3
EA-18G	13	0	13	120	26	15	5	20	120	40.0
F-16	66	0	66	90	99	80	20	100	60	100.0
F-16	311	104	415	30	207.5	318	106	424	15	106.0
FA-18A	7	0	7	35	4.1	15	5	20	45	15.0
KC-135	40	12	52	180	156	60	20	80	180	240.0
C-130	4	0	4	180	12	10	5	15	180	45.0
F-35	2	0	2	30	1	50	30	80	30	40.0
Total	**554**	**136**	**690**	**—**	**702**	**673**	**241**	**914**	**—**	**859**

(MIANG & OHANG, 2021)
Note: The F-16 is listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-11 Existing and Proposed Annual Sorties and Time in Pike East MOA

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Time in Airspace per Sortie (Minutes)	Baseline Annual Time in Airspace (Hours)	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	40	0	40	95	63.3	40	0	40	90	60
AH-1	10	0	10	240	40	10	0	10	240	40
B-52	48	0	48	165	132	50	20	70	120	140
EA-18G	13	0	13	120	26	15	5	20	120	40
F-16	66	0	66	95	104.5	70	30	100	40	66.7
F-16	2	1	3	5	0.3	2	1	3	5	0.25
FA-18A	7	0	7	35	4.1	10	5	15	35	8.75
KC-135	20	7	27	270	121.5	30	10	40	270	180
MH-60	70	0	70	190	221.7	70	0	70	190	221.6
C-130	8	0	8	180	24	10	0	10	180	30
CV-22	13	0	13	220	47.7	10	5	15	180	45
F-35A	2	0	2	30	1	50	30	80	30	40
MC-12	0	1	1	120	2	0	5	5	120	10
Total	**299**	**9**	**308**	**—**	**788**	**367**	**111**	**478**	**—**	**882**

(MIANG & OHANG, 2021)
Note: The F-16 is listed twice to account for different training scenarios; the time in airspace varies.
Key: MOA = Military Operations Area.

Table 2-12 Existing and Proposed Annual Sorties and Time in R-4201A

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Time in Airspace per Sortie (Minutes)	Baseline Annual Time in Airspace (Hours)	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	50	16	66	23	25.3	55	20	75	20	25.0
A-10	1,320	0	1,320	27	594.0	1190	0	1,190	20	396.7
F-16	50	0	50	23	19.2	50	30	80	20	26.7
F-16	174	57	231	27	104.0	124	41	165	20	55.0
B-2	1	0	1	18	0.3	5	0	5	20	1.7
B-52H	14	6	20	95	31. 7	30	10	40	80	53.3
AV-8B	28	0	28	14	6.5	35	10	45	17	12.8
C-17	2	0	2	9	0.3	5	0	5	10	0.8
C-130	7	0	7	14	1.6	50	0	50	10	8.3
EA-18G	0	0	0	0	0.0	5	0	5	17	1.4
MC-12	0	3	3	104	5.2	0	5	5	80	6.7
MH-60	35	0	35	36	21.0	50	0	50	30	25.0
CH-47	19	0	19	59	18.7	25	0	25	40	16.7
AC-130	4	4	8	162	21.6	5	5	10	121	20.2
Total	**1,704**	**86**	**1,790**	**—**	**849**	**1,629**	**121**	**1,750**	**—**	**650**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: R = Restricted Area.

Table 2-13 Existing and Proposed Annual Sorties and Time in R-4201B

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Time in Airspace per Sortie (Minutes)	Baseline Annual Time in Airspace (Hours)	Proposed Day Sorties (0700–2200)	Proposed Night Sorties (2200–0700)	Total Proposed Sorties	Proposed Time in Airspace per Sortie (Minutes)	Proposed Annual Time in Airspace (Hours)
A-10	50	16	66	3	3.3	55	20	75	10	12.5
A-10	0	0	0	1	0.0	1,190	0	1,190	2	39.7
F-16	50	0	50	3	2.5	50	30	80	10	13.3
F-16	58	19	77	1	1.3	41	14	55	3	2.8
B-2	1	0	1	2	0.0	5	0	5	10	0.8
B-52H	14	6	20	11	3.7	30	10	40	40	26.7
AV-8B	28	0	28	2	0.9	35	10	45	8	6.0
C-17	2	0	2	1	0.0	5	0	5	5	0.4
C-130	7	0	7	2	0.2	50	0	50	5	4.2
EA-18G	0	0	0	0	0.0	5	0	5	8	0.7
MC-12	0	3	3	12	0.6	0	5	5	40	3.3
MH-60	35	0	35	4	2.3	50	0	50	15	12.5
CH-47	19	0	19	7	2.2	25	0	25	20	8.3
AC-130	4	4	8	18	2.4	5	5	10	59	9.8
Total	**268**	**48**	**316**	**—**	**20**	**1,546**	**94**	**1,640**	**—**	**141**

(MIANG & OHANG, 2021)
Note: The A-10 and F-16 are listed twice to account for different training scenarios; the time in airspace varies.
Key: R = Restricted Area.

Table 2-14 Existing Annual Sorties and Time in Hersey MOA

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Annual Time in Airspace per Sortie (Minutes)	Total Annual Time in Airspace (Hours)
A-10	1.5	0.5	2	45	1.5
Total	**1.5**	**0.5**	**2**	**—**	**2**

(MIANG & OHANG, 2021)
Key: MOA = Military Operations Area.

Table 2-15 Existing Annual Sorties and Time in Grayling Temporary MOA

Aircraft	Baseline Day Sorties (0700–2200)	Baseline Night Sorties (2200–0700)	Total Baseline Sorties	Baseline Time in Airspace per Sortie (Minutes)	Total Annual Time in Airspace (Hours)
A-10	69	8	77	17	21.8
F-16	112	0	112	9	16.8
B-52	13	5	18	15	4.5
C-130	3	0	4	4	0.3
EA-18G	13	0	13	13	2.8
KC-135	12	3	15	36	9
MH-60	70	0	70	11	12.8
Total	**292**	**16**	**309**	**—**	**68**

(MIANG & OHANG, 2021)
Key: MOA = Military Operations Area.

Table 2-16 Proposed Annual Sorties and Time in VR-1601 and VR-1602

Aircraft	Proposed Sorties VR-1601: APN to R-4201 Day (0700–2200)	Proposed Sorties VR-1602: R-4201 to APN) Day (0700-2200)	Total Proposed Sorties	Total Annual Time in Airspace (Hours)
A-10	20	15	35	3.6
F-16	20	15	35	3.2
B-52	4	0	4	0.3
C-130	20	10	30	2.2
EA-18G	32	32	64	5.1
KC-135	20	10	30	4.3
MH-60	4	2	6	0.6
T-1	20	10	30	5.4
Total	**140**	**94**	**234**	**25**

(MIANG & OHANG, 2021)
Note: Annual time in airspace is based on average airspeed of each aircraft to travel the full 36 nautical mile VR.
Key: APN = Alpena County Regional Airport; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

Chaff and flare are currently being used in all the MOAs and RAs within the Alpena SUA Complex. Under the Proposed Action, the number of expenditures would increase by approximately 1,000 chaff expenditures and 1,500 flare expenditures per year across the Alpena SUA Complex, as shown in Table 2-17 and Appendix H. Although the usage would occur across all the MOAs and RAs, there is generally higher usage in R-4201A/B and Pike West MOA. The altitudes that aircraft release the chaff and flare vary. Expenditures would be released at a low of 1,000 feet AGL within R-4201A/B; outside of R-4201, the minimum altitude of chaff/flare release would be no less than 2,000 feet AGL. If there are seasonal fire restrictions, the flares would be released at a low of 2,000 feet AGL in the restricted areas during those periods. While the Proposed Action would increase chaff and flare use above existing levels, proposed levels of chaff and flare use would remain well below the levels analyzed in the NGB's *Environmental Assessment for Deployment of Chaff and Flares in Military Operations Area* (2002).

Table 2-17 Existing and Proposed Chaff and Flare Use within the Alpena Special Use Airspace Complex

Component	Chaff	Flare
Types	RR-188	M206
Existing Number	5,103	7,900
Proposed Number	6,103	9,400
Locations	All; higher usage in R-4201 and Pike West MOA for both chaff and flare	
Altitude Expended	Varies, generally 2,000 feet AGL or higher for both chaff and flare Exception is R-4201A/B, where minimum would be 1,000 feet AGL*	

(MIANG & OHANG, 2021)
Note: * If there are seasonal fire restrictions, flares would be released at a low of 2,000 feet AGL in the restricted areas during those periods.
Key: AGL = above ground level; MOA = Military Operations Area.

2.2 Alternative B: No Steelhead Low MOAs

Alternative B would include all aspects of the detailed Proposed Action (see Section 2.1) for creation, modification, and utilization parameters, except that the three Steelhead Low MOAs would not be established (i.e., Steelhead Low North, South, and East MOAs). Therefore, no sorties would occur within any of the proposed Steelhead Low MOA boundaries but would be redistributed in existing SUA. For example, sorties proposed to use the Steelhead Low MOAs under the Proposed Action would likely continue to use the Steelhead MOA. The ability for airmen to conduct low-altitude, overland training events such as LOWAT, LASDT, and Electronic Warfare threat reactions would be greatly reduced under Alternative B. Alternative B would not lower fuel usage by the 127 WG A-10s because they would still have to fly to R-4201A/B for LASDT and LOWAT training requirements.

Under Alternative B, chaff use would increase by approximately 510 expenditures per year, and flare use would increase by approximately 790 expenditures per year (increases of approximately 10 percent). Expenditures would be distributed across the Alpena SUA Complex, including within the Steelhead MOA. Minimum altitudes of release would be no less than 2,000 feet AGL, except in R-4201A/B, where expenditures may be released as low as 1,000 feet AGL in the absence of fire restrictions.

2.3 Alternative C: No Grayling East or West MOA

Alternative C would include all other aspects of the detailed Proposed Action (see Section 2.1) for creation, modification, and utilization parameters, except there would be no establishment of the Grayling East and Grayling West MOAs. Therefore, no sorties would occur within the proposed Grayling MOA boundaries but would be redistributed in existing SUA. The Alpena CRTC would continue to request activation of the Grayling Temporary MOA each year to support annual exercises, and the Grayling Temporary MOA would remain uncharted. In addition, the Hersey MOA would remain with the MIANG. This would result in a reduction of quality training at Grayling Range and R-4201 because aircraft would be limited in their maneuver capability.

Under Alternative C, chaff use would increase by approximately 510 expenditures per year, and flare use would increase by approximately 790 expenditures per year (increases of approximately 10 percent). Expenditures would be distributed across the Alpena SUA Complex; however, without the proposed Grayling West or East MOAs, and given that Grayling Temporary MOA is normally active for only two weeks per year, expenditures would occur over a smaller geographic area than either the Proposed Action or Alternative B. Minimum altitudes of release would be no less than 2,000 feet AGL, except in R-4201, where expenditures may be released as low as 1,000 feet AGL in the absence of fire restrictions.

2.4 Alternative D: No Action Alternative

The No Action Alternative would result in no change to the Alpena SUA Complex as currently charted (refer to Figure 1-1). No new MOAs, RAs, or MTRs would be established or modified. Alpena CRTC would continue to request activation of the Grayling Temporary MOA each year, and the Grayling Temporary MOA would remain uncharted. The Hersey MOA would remain with the MIANG. The airspace would remain less than sufficient for current-generation aircraft, ordnance, and tactics and would restrict support for future-generation aircraft, tactics, and techniques. Although the No Action Alternative does not meet the project objectives or fulfill the purpose and need, it is carried forward for detailed analysis to provide a baseline against which the Proposed Action and alternatives can be evaluated, as required in 32 CFR 989.8.

2.5 Range of Reasonable Alternatives

The range of reasonable alternatives for meeting the project's purpose (Section 1.2) and need (Section 1.3) and satisfying the MIANG and NGB's project objectives examined suitable SUA and MTR siting.

Airspace

All SUA proposals are prepared and coordinated according to the procedures outlined in FAA JO 7400.2. NGB and MIANG developed the proposed airspace modifications and additions and coordinated early with the Minneapolis Air Route Traffic Control Center (ARTCC) and other interested parties to put forth an optimum proposal. This early planning and coordination process inherently focuses the range of reasonable airspace alternatives considered to a very small subset, and minimization measures are incorporated by design into the proposal to lessen aeronautical and environmental impacts. The following paragraphs discuss the project objectives, including the purpose of the Proposed Action, that were used as evaluation measures during the process of developing airspace alternatives.

Per FAA JO 7400.2N, other airspace alternatives must be considered. Suitable airspace for a unit is evaluated for value by its volume, proximity to the airfield where a sortie begins, the amount of time the aircraft can spend in the airspace, and the attributes of the airspace (i.e., what kind of training, tactics, techniques, and procedures are supported). The purpose of the Proposed Action—to amend and establish Alpena CRTC's SUA supporting military readiness requirements—is inherently tied to the airspace surrounding Alpena CRTC. Other airspace alternatives must meet the project objectives described in Section 1.4. In addition, the ideal distance from Alpena CRTC to the SUA should be no further than 150 nautical miles to ensure there is enough time to complete their training missions. The only other MOA within this range is the Minnow MOA in Wisconsin. Minnow MOA is approximately 50 nautical miles west of Hersey MOA. As previously discussed, Hersey MOA is farther away from the other MOAs in the Alpena SUA Complex and is the least utilized of the MOAs. It does not provide suitable training space for current tactics, techniques, and procedures and is currently only used as an alternative when the weather to the north and east of Hersey MOA is unfavorable.

Two of the objectives described in Section 1.4 include providing connecting airspace from the existing SUA complex to the Grayling Range for continuity and providing low-altitude airspace closer than the Grayling Range, which would decrease in-flight time and fuel usage. Minnow MOA is approximately 100 nautical miles southwest of Grayling Range; there are no other MOAs between these SUAs. Therefore, it would not meet the objective of providing connecting airspace to Grayling Range. Minnow MOA has a floor of 10,000 feet MSL and is an overwater MOA; therefore, it would not meet the objective of providing overland low-altitude airspace closer than the Grayling Range. Given these factors, Minnow MOA was eliminated from detailed analysis. No other SUAs meet the project objectives and the ideal distance to Alpena CRTC.

MTRs

Selection criteria for the proposed VR-1601 and VR-1602 route include the following:

- fairly direct route between Alpena CRTC and Grayling Range
- avoids large towns
- incorporates check turns[2] for training on a low-level route
- avoids infrastructure such as tall towers that would interfere with a low-level route

The MIANG and Alpena CRTC personnel examined the area between Alpena CRTC and Grayling Range to determine the most suitable route based on these screening criteria. No additional MTR locations were identified.

2.6 Comparison of Alternatives Analyzed in Detail

Table 2-18 summarizes the components of each of the alternatives (Alternative A/Proposed Action, Alternative B, Alternative C, and Alternative D/No Action Alternative). Table 2-19 summarizes how each of these alternatives meets the project objectives, identified in Section 1.4. As noted in Table 2-19, not all action alternatives carried forward for detailed analysis fully meet all the project objectives; however, they are deemed reasonable for inclusion in the EA because they would be viable in meeting the project's general purpose and need for action.

[2] A check turn is a tactical maneuver directed by a formation flight lead. It changes the ground track and possibly the position of the aircraft in the formation. Depending on the airspace and operational circumstances, it achieves multiple objectives including increasing tactical situational awareness and repositioning formation aircraft in preparation for the next required or anticipated air combat maneuver.

Table 2-18 Comparison of Alternatives Analyzed in Detail in Environmental Assessment

Project Component	Existing Altitude Designation	Alternative A (Proposed Action)	Alternative B	Alternative C	Alternative D (No Action)
Grayling Temporary MOA	5,000 ft – 17,999 ft MSL	Discontinue use	Discontinue use	Request annually; remain uncharted	Request annually; remain uncharted
Grayling East MOA	Not established	10,000 ft – 17,999 ft MSL	10,000 ft – 17,999 ft MSL	Not established	Not established
Grayling West MOA	Not established	500 ft AGL – 17,999 ft MSL	500 ft AGL – 17,999 ft MSL	Not established	Not established
Steelhead MOA	6,000 ft – 17,999 ft MSL	Realign internal lateral boundaries; vertical limits remain	Realign internal lateral boundaries; vertical limits remain	Realign internal lateral boundaries; vertical limits remain	Existing designation
Steelhead Low North MOA	Not established	500 ft AGL – 5,999 ft MSL	Not established	500 ft AGL – 5,999 ft MSL	Not established
Steelhead Low South MOA	Not established	4,000 ft – 5,999 ft MSL	Not established	4,000 ft – 5,999 ft MSL	Not established
Steelhead Low East MOA	Not established	500 ft AGL – 5,999 ft MSL	Not established	500 ft AGL – 5,999 ft MSL	Not established
Pike East MOA	300 ft AGL – 17,999 ft MSL	Realign internal lateral boundaries; vertical limits remain	Realign internal lateral boundaries; vertical limits remain	Realign internal lateral boundaries; vertical limits remain	Existing designation
Pike West MOA	6,000 ft – 17,999 ft MSL	Realign internal lateral boundaries; vertical limits remain	Realign internal lateral boundaries; vertical limits remain	Realign internal lateral boundaries; vertical limits remain	Existing designation
Hersey MOA	5,000 ft – 17,999 ft MSL	Return to NAS	Return to NAS	Existing designation	Existing designation
VR-1601/VR-1602	Not established	300 ft – 1,500 ft AGL	300 ft – 1,500 ft AGL	300 ft – 1,500 ft AGL	Not established
R-4201A	Surface – 23,000 ft MSL	Existing designation	Existing designation	Existing designation	Existing designation
R-4201B	Surface – 9,000 ft MSL	Raise ceiling to 23,000 ft MSL	Raise ceiling to 23,000 ft MSL	Raise ceiling to 23,000 ft MSL	Existing designation

Key: AGL = above ground level; ft = feet; MOA = Military Operations Area; MSL = mean sea level; NAS = National Airspace System; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

Table 2-19 Comparison of Alternatives Analyzed in Detail Against Project Objectives

Objective (Section 1.3)	Alternative A (Proposed Action)	Alternative B	Alternative C	Alternative D (No Action)
Provide a variety of low-altitude, overland SUA to accommodate restrictive weather variations and cloud cover interference	Yes, would meet this objective.	Partially. The creation of the Grayling West MOA would provide increased low-altitude, overland SUA compared with the existing conditions, but it alone would not offer substantial accommodations for weather variations and cloud interference.	Partially. The creation of the Steelhead Low MOAs would provide increased low-altitude, overland SUA compared with the existing conditions, but these alone would not offer substantial accommodations for weather variations and cloud interference.	No, would not meet this objective.
Provide connecting airspace from the existing SUA complex than the Grayling Range Restricted Airspace for safe training continuity	Yes, would meet this objective.	Yes, would meet this objective.	Partially. Only the MTRs would provide connectivity between the Alpena SUA Complex and Grayling Range, but the SUA would not be contiguous without establishment of the proposed Grayling MOAs.	No, would not meet this objective.
Provide useful, appropriately sized low-altitude airspace closer to the Grayling Range, which would decrease in-flight time and fuel usage	Yes, would meet this objective.	Yes, would meet this objective.	Yes, would meet this objective.	No, would not meet this objective.

Key: MOA = Military Operating Area; MTR = Military Training Route; SUA = Special Use Airspace.

Chapter 3. Affected Environment

This chapter describes the baseline conditions of the existing environment for those resources that could be reasonably affected by the Proposed Action or alternatives. The study area for the affected environment generally includes the existing and proposed SUA and the area beneath this airspace (as shown in Figure 2-1); however, the specific study area may vary from resource to resource depending on the extent to which that resource may be affected. Appendix A includes more detailed background and regulatory information, as well as a discussion of resources initially considered but eliminated from detailed evaluation in this EA, including Section 4(f) of the Department of Transportation Act (A.6), geological resources (A.7), infrastructure and transportation (A.10), visual resources (A.11), and hazardous materials and wastes (A.14).

3.1 Airspace Management

DAF defines airspace management as the coordination, integration, and regulation of airspace use within defined dimensions. The objective is to meet military training requirements through the safe and efficient use of available navigable airspace in a peacetime environment while minimizing the impact on other aviation users and the public. There are two categories of airspace or airspace areas: regulatory and nonregulatory. Within these two categories, further classifications include controlled, uncontrolled, special use, and other airspace. The categories and types of airspace are dictated by: (1) the complexity or density of aircraft movements; (2) the nature of the operations conducted within the airspace; (3) the level of safety required; and (4) national and public interest in the airspace. Appendix A, Section A.1 contains background and definitions concerning airspace.

The controlling agency for all the SUA in the Alpena SUA Complex is the FAA, Minneapolis ARTCC. Minneapolis ARTCC is responsible for coordinating airspace activities with Toronto and Cleveland centers and issuing approval for aircraft to operate as scheduled by the Alpena CRTC. Black Talon (i.e., the Alpena CRTC Operations) provides real-time airspace management for the Alpena Complex once Minneapolis ARTCC approval for access to the scheduled areas has been received. The Alpena SUA Complex falls within the jurisdiction of Toronto, Minneapolis, and Cleveland centers. Each center retains authority over the Special Activity Airspace within their designated airspace. Minneapolis Center must receive Cleveland Center approval before releasing Steelhead MOA to Alpena CRTC. The scheduling and using agency for the Alpena SUA Complex is the Alpena CRTC. Black Talon serves as the coordinating agency for receiving and disseminating all information concerning the Alpena SUA Complex for the current day. This includes, but is not limited to, airspace approvals, denials, recalls, and changes (ARTCC, 2017). Grayling Range's impact area is owned by the Michigan Army National Guard. As a result, Camp Grayling's Range Control Office manages the airspace for R-4201A/B. Grayling Air Gunnery Range manages the scheduling process for R-4201A/B.

MOAs are considered active during the approved times as posted in the NOTAM within the approved altitude blocks, and released by the ARTCC to the designated users, unless otherwise modified and coordinated with the proper agencies. When airspace can be returned due to changes in mission needs or requirements, changing weather conditions, FAA airspace requirements for civilian aircraft, altitude blocks, or early termination, Black Talon must advise Minneapolis ARTCC as soon as possible of any portion of the Alpena SUA Complex that can be returned for Air Traffic

Control (ATC) use. Restricted Areas (i.e., R-4207, within the Alpena SUA Complex), are also released to the controlling agency when not in use. These procedures minimize impacts on nonparticipating aircraft.

As shown in Figure 1-1, numerous VRs are within and adjacent to the Alpena SUA, including VRs 634, 664, 1624, 1625, 1626, 1627, 1628, 1644, 1645, 1647, and 1648. There are eight VRs that access R-4201 and Grayling Range from Alpena CRTC, and four of these routes are reciprocal. Some of the VRs are completely outside of the Alpena SUA Complex. Operations on VRs are conducted in accordance with VFR as long as flight visibility is at least three nautical miles and the cloud ceiling is 1,500 feet AGL, in accordance with DAF training rules for low flight VFR. Black Talon schedules and deconflicts all MTRs located within Michigan.

Numerous general aviation airports are located underneath and adjacent to the existing Alpena SUA Complex (refer to Table A-3, which lists all airports, and Figure A-2 and Figure A-3, which show airports and airspace on FAA sectional aeronautical charts, in Appendix A, Section A.1). Most of these airports are small, general aviation airports that may be open to the public and do not have an ATC tower. Some of these airports are surrounded by Class D airspace (Appendix A, Section A.1). Class D airspace encompasses a five-statute-mile radius around an operating ATC airport, extending from the ground to 2,500 feet AGL or higher. Class D airports within and adjacent to the existing Alpena SUA Complex include Alpena County Regional Airport and Grayling Army Airfield; Grayling Army Airfield is adjacent to R-4201. Alpena County Regional Airport, where Alpena CRTC is located, has two runways and is open to the public. Most operations are general aviation, with smaller percentages of commercial and military operations. Class C airspace is designed to provide additional ATC into and out of primary airports where aircraft operations are periodically at high-density levels. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local ATC entities. Several Class C airports are in Michigan (Bishop International in Flint, Gerald R. Ford International in Grand Rapids, and Capital Region International in Lansing), but none are within the airspace affected in this EA. Class B airspace is typically associated with major metropolitan airports. Detroit Metropolitan Wayne County Airport is the only Class B airport in Michigan, and it is not within the airspace directly affected in this EA.

3.2 Safety

Aircraft Safety

Aircraft mishaps may be caused by midair collisions with other aircraft or objects, weather difficulties, bird-/wildlife-aircraft strikes, mechanical malfunctions, or other reasons. 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. Most aircraft accidents involve a takeoff or landing incident; high-performance maneuvering, such as operations typically occurring in a MOA, also have a relatively high mishap rate. Mishap rates for military aircraft operating within Alpena SUA are shown in Table A-4 in Appendix A. Flight safety is a critical component of all training missions conducted within Alpena SUA. Further information about safety planning and awareness training are in Appendix A, Section A.2.

3.3 Air Quality

Air quality in a region or area is measured by the concentration of criteria pollutants in the atmosphere. Under the authority of the Clean Air Act, the U.S. Environmental Protection Agency (USEPA) established the National Ambient Air Quality Standards (NAAQS) for criteria pollutants, including ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter equal to or less than ten micrometers in diameter and 2.5 micrometers in diameter, and lead. NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Air quality is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

A region or area that fails to meet an NAAQS for any pollutant is classified as being in "nonattainment" for that pollutant. A nonattainment area that subsequently meets the NAAQS can be reclassified as a "maintenance" area. Both nonattainment and maintenance areas have more rigorous air regulations and monitoring requirements designed to bring regional air quality into attainment with all NAAQS. Federal actions within nonattainment and maintenance areas must demonstrate either that total direct and indirect emissions are below established *de minimis* levels for each applicable criteria pollutant, or prepare a formal General Conformity Determination, in accordance with the General Conformity Rule (40 CFR Part 93). More detailed regulatory and background information on air quality is included in Appendix A, Section A.3.

The airspace study area includes the volume of air extending up to the mixing height—the altitude at which the lower atmosphere will undergo mechanical or turbulent mixing—and including the extent of each underlying county. Pollutants that are released above the mixing height typically will not disperse downward and thus will have little or no effect on ground-level concentrations of pollutants. Per 40 CFR 93.153(c)(2), the default mixing height of 3,000 feet AGL is used in this EA.

The study area includes the areas under the proposed Grayling West MOA, R-4201A/B, proposed VRs, Pike East MOA, proposed Steelhead Low North MOA, and proposed Steelhead Low East MOA, which includes all or part of the following counties: Alcona, Alpena, Arenac, Crawford, Huron, Iosco, Montmorency, Ogemaw, Oscoda, Otsego, Presque Isle, Roscommon, and Sanilac, Michigan. The attainment statuses of the counties with the study area are summarized in Table 3-1.

The floors of the Grayling Temporary, proposed Grayling East, Pike West, Steelhead, and proposed Steelhead Low South MOAs all begin at altitudes greater than 3,000 feet AGL, so changes within these SUA would not affect air quality.

Climate

The Köppen-Geiger climate classification system is the most used climate classification system. It designates climate regions globally and is broadly used in climate change research and modeling. The system derives its classification data primarily from vegetation, which is dependent on the temperature and precipitation of a region. The system divides Earth into five climate zones based on multiple criteria, primarily temperature, and 30 subtypes. The five zones include the following:

- Zone A: tropical or equatorial
- Zone B: arid or dry
- Zone C: warm/mild temperate
- Zone D: continental
- Zone E: polar

Table 3-1 Air Quality Control Regions and Attainment Status in the Study Area

County	Portion of Proposed Action[1]	Air Quality Control Region	Attainment Status
Alcona	Pike East MOA	Upper Michigan Intrastate	Attainment
Alpena	Pike East MOA VR-1601/1602	Upper Michigan Intrastate	Attainment
Arenac	Steelhead Low North MOA	Central Michigan Intrastate	Attainment
Crawford	Grayling West MOA R-4201A/B	Upper Michigan Intrastate	Attainment
Huron	Steelhead Low North MOA Steelhead Low East MOA	Central Michigan Intrastate	Ozone Maintenance [2]
Iosco	Pike East MOA Steelhead Low North MOA Steelhead Low East MOA	Central Michigan Intrastate	Attainment
Montmorency	Grayling West MOA VR-1601/1602	Upper Michigan Intrastate	Attainment
Ogemaw	Grayling West MOA	Central Michigan Intrastate	Attainment
Oscoda	Grayling West MOA	Upper Michigan Intrastate	Attainment
Otsego	Grayling West MOA R-4201A VR-1601/1602	Upper Michigan Intrastate	Attainment
Presque Isle	Pike East MOA	Upper Michigan Intrastate	Attainment
Roscommon	Grayling West MOA	Central Michigan Intrastate	Attainment
Sanilac	Steelhead Low East MOA	Central Michigan Intrastate	Attainment

40 CFR 81.195; 40 CFR 81.197; 40 CFR 93.153 (c)(2)(xxii); (USEPA, 2022)

Notes:

[1] Proposed activities at 3,000 feet AGL or higher are above the default mixing height and, therefore, contribute negligibly to ground-level criteria pollutant emissions. Areas above 3,000 feet are not included in this table.

[2] Huron County was designated as a nonattainment area (2004, 2005, 2006), then a maintenance area (2007) for the 8-hour ozone (1997) NAAQS. This standard was subsequently revoked on April 6, 2015, and Huron County is in attainment with the stricter 2008 ozone NAAQS. However, the DC Circuit Court termed these "orphan maintenance areas" in *South Coast Air Quality Management District v. EPA* (2018), ruling that these areas were still subject to NAAQS maintenance plan requirements. Therefore, these areas, though in full attainment for all current ozone standards, must still meet conformity requirements for the revoked 1997 ozone standard.

Key: MOA = Military Operations Area; NAAQS = National Ambient Air Quality Standard; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

The study area falls within Köppen-Geiger 'Dfb' climate category, which classifies the general climate as boreal and fully humid, with snowy winters and warm summers (CC&IFD, 2019). The *Michigan Hazard Mitigation Plan* states that, in Michigan, climate change affects severity of thunderstorms, severe winds, extreme temperatures, flooding, drought, erosion, wildfires, and invasive species (EMHSD, 2019). Climate change issues also tie in with the problems of infrastructure failures and public health emergencies. Tangible indicators of climate change are already present. For example, in Michigan's daily record temperatures at weather stations, new heat records outnumbered new cold records by three to one during the 1990s, and by six to one during the 2000s (EMHSD, 2019).

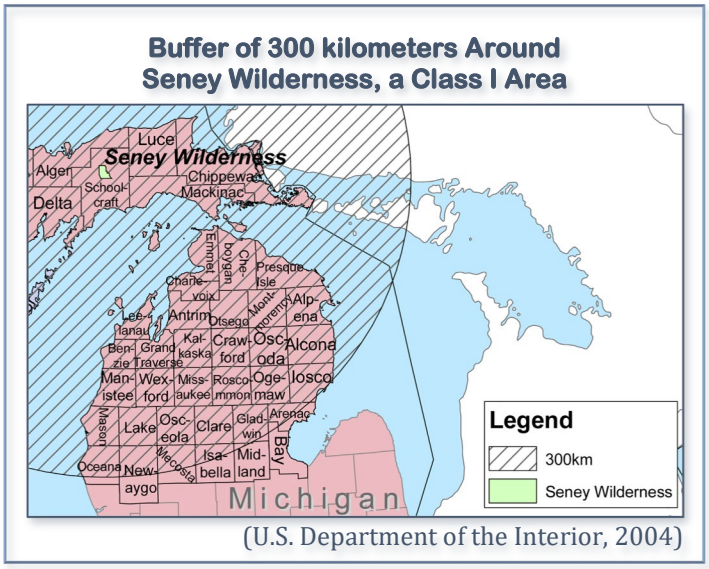
Regional Air Quality

The Air Quality Division of the EGLE is the regulatory authority for sources of air pollution. Air quality in Michigan is generally in the good or moderate range with occasional days that may be unhealthy for sensitive groups. In 2019, only five days had air quality alerts; none of those alerts were within the study area. The weather plays a major role in air quality and can either help increase or decrease the amount of pollution in the air. High temperatures, sun, and longer days are conducive to ozone formation, whereas rain tends to wash pollutants out of the air (EGLE, 2020a).

The entire study area under the Alpena SUA Complex includes the Upper Michigan Intrastate and Central Michigan Intrastate Air Quality Control Regions and all or parts of 13 counties in Michigan, all of which are designated as being in attainment for all criteria pollutants; however, Huron County is subject to maintenance requirements for the revoked 1997 ozone NAAQS (USEPA, 2022). Table 3-1 shows the air quality control regions and attainment statuses by county and identifies where each component of the Proposed Action would occur. Of the 46 ambient air quality monitors in Michigan, only one—the Harbor Beach monitor in Huron County—is within the study area (EGLE, 2019a). The Harbor Beach monitor collects data for ozone and meteorological conditions. Air quality at this station has experienced some days with high ozone levels but has demonstrated compliance with the ozone maintenance anti-backsliding requirements (see Table A-7 in Appendix A).

Since the study area includes an ozone maintenance area, the General Conformity Rule applies to this action. Per the General Conformity Rule, total direct and indirect emissions of the proposed project are compared to specified pollutant thresholds for which the area is in maintenance/nonattainment to determine whether the action is *de minimis* or requires a full Conformity Determination to ensure regional attainment goals are not hindered. See Appendix A, Section A.3 for background information on the General Conformity Rule.

Under the Prevention of Significant Deterioration Program, Section 162(a) of the Clean Air Act affords special protections to some federal lands such as national parks, national wilderness areas, and national monuments that are designated as Class I areas. The only Class I area within 300 kilometers of the study area is Seney Wilderness (40 CFR 81.414); see right inset. Mobile sources, including aircraft, are not subject to the requirements of Prevention of Significant Deterioration, but Seney Wilderness is included in this EA as a sensitive air resource.



3.4 Noise

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise; perceived importance of the noise; its appropriateness in the setting, time of day, and type of activity during which the noise occurs; and sensitivity of the individual.

The land underneath the Alpena SUA Complex consists of several forest regions, small- to medium-sized municipalities, and rural areas. General noise levels of existing conditions are available through the National Park Service (National Park Service, 2021). According to the National Park Service, noise levels range from the mid-30s to mid-40s L50 Sound Pressure Level (SPL) in the region where Alpena SUA Complex is located. SPL is a logarithmic measure of the effective acoustic pressure of a sound relative to a reference value and is measured in decibels. L50 is the level that is exceeded fifty percent of the time. In other words, noise is above L50 SPL fifty percent of the time and below L50 SPL the other fifty percent of the time. The higher SPLs are most likely due to sporadic or intermittent events. Ambient noise levels are higher in the areas under the Steelhead MOAs as compared to the areas where the Pike and Grayling MOAs are located.

Table 3-2 shows typical sound levels for various types of residential land uses. Very noisy urban areas have the highest sound levels at 66 A-weighted decibels (dBA) during the daytime and 58 dBA during nighttime hours. Normal suburban areas are 50 dBA during the day and 44 dBA at night. Rural land uses tend to be the quietest at 40 dBA during the day and 34 dBA at night. This corresponds with the sound levels that the National Park Service estimated in the region where the Alpena SUA Complex is located.

Figure 3-1 provides a chart of sound levels from typical noise sources. At the lower end of the scale, leaves rustling produce sound levels of approximately 20 dBA; a passing automobile or bus is around 60 to 70 dBA; and, at the higher end of the scale, an air raid siren at 120 to 130 dBA.

As shown in Table 3-3, SUAs that were modeled under the existing conditions include Steelhead MOA, Pike East MOA, Pike West MOA, Hersey MOA, R-4201A/B, and the Grayling Temporary MOA. As a temporary MOA, the establishment of the Grayling Temporary MOA must be requested annually, so the floor and ceiling can vary slightly year to year. This MOA was modeled with a floor of 5,000 feet MSL and a ceiling of 17,999 feet MSL. Training in the Grayling Temporary MOA normally occurs for only two weeks per year, and the mix of aircraft changes annually. R-4201A/B is above the Grayling Range, which was founded in 1913 as a multipurpose training range complex with an Army airfield. Training activities at the range include artillery, air-to-ground weapons, and aircraft operations. As a result, populations in this region are accustomed to high ambient noise levels from aircraft and artillery, including impulsive noise.

As shown in Figure 1-1, numerous VRs are within and adjacent to the Alpena SUA, including VRs 634, 664, 1624, 1625, 1626, 1627, 1628, 1644, 1645, 1647, and 1648. Some of the VRs are located within the Alpena SUA, particularly between Alpena CRTC and Grayling Range, and some of the VRs are completely outside of the Alpena airspace region. These existing VRs have low annual utilization rates. The highest number of sorties was 13 during one year on VR-1648 and the lowest was zero on several VRs; the average is only two sorties flown on each VR per year (Alpena, 2018 and 2019). As shown in Table 2-16, there are 234 annual sorties proposed for VR-1601 and VR-1602, which would result in a noise level of less than 35 dBA (as discussed in Section 4.4.1), Therefore, it can be expected that a VR with 13 annual sorties would not affect the ambient noise environment with noise levels of 35 to 45 dBA. Given the low number of annual and monthly sorties, the existing VRs were not included in the noise model.

Noise metrics used in this analysis include Day-Night Average Sound Level (DNL) and Onset-Adjusted Monthly Day-Night Average Sound Level (Ldnmr). DNL is the primary noise metric used to describe the aviation noise environment. DNL is defined as the average sound energy in a 24-hour period with a 10-decibel adjustment added to nighttime noise events occurring between the hours of 2200 and 0700. Ldnmr is the average sound energy in a 24-hour period with a 10-decibel adjustment added to the nighttime levels (similar to DNL), and up to an additional 11-decibel adjustment for acoustical events with onset rates greater than 15 decibels per second, such as high-speed jets operating near the ground. Because of the adjustments for rapid onset, Ldnmr is always equal to or greater than DNL. These noise levels are measured in dBA.

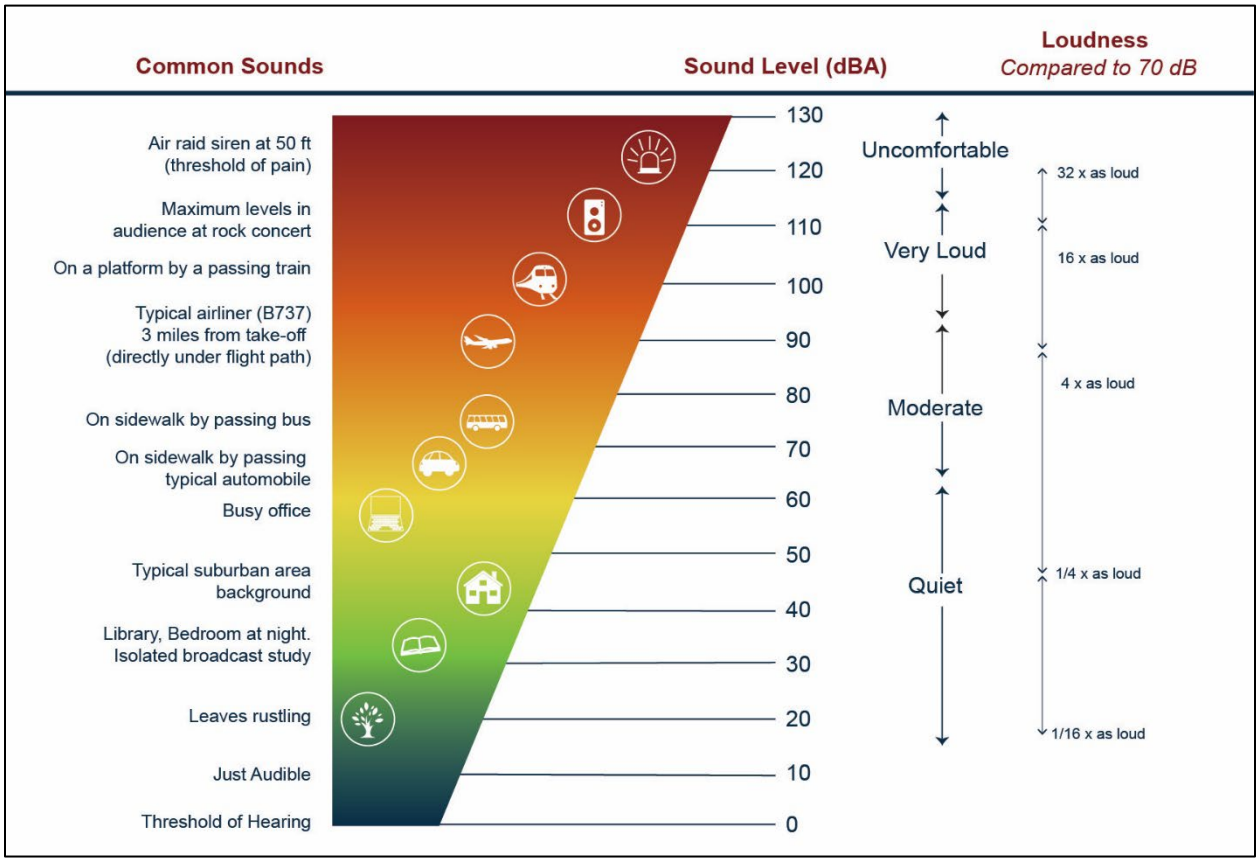
Table 2-9 through Table 2-15 show the existing aircraft sortie and hours that generated the noise levels shown in Table 3-3. As shown in Table 3-3, most of the noise levels in the Alpena SUA are at or below 35 dBA Ldnmr and DNL. The restricted areas have levels that are higher with R-4201A at 62 dBA Ldnmr and 61 dBA DNL, and R-4201B at 45 dBA Ldnmr and 44 dBA DNL.

Table 3-2 Typical Residential Sound Levels

Residential Land Use	Daytime Sound Level	Nighttime Sound Level
Very Noisy Urban	66 dBA	58 dBA
Noisy Urban	61 dBA	54 dBA
Urban/Noisy Suburban	55 dBA	49 dBA
Quiet Urban/Normal Suburban	50 dBA	44 dBA
Quiet Suburban	45 dBA	39 dBA
Very Quiet Suburban/Rural	40 dBA	34 dBA

(ANSI/ASA, 2013)

Figure 3-1 Sound Levels from Typical Sources



Source: Adapted from Cowan, 1994.

Table 3-3 Existing Ldnmr and DNL Values within Alpena SUA Complex

Airspace	Ldnmr	DNL
Steelhead MOA	35 dBA	35 dBA
Pike West MOA	35 dBA	35 dBA
Pike East MOA	35 dBA	35 dBA
Hersey MOA	<35 dBA	<35 dBA
R-4201A	62 dBA	61 dBA
R-4201B	45 dBA	44 dBA
Grayling Temporary MOA	<35 dBA	<35 dBA

(MIANG, 2021)

Note: Table 2-9 through Table 2-15 show the existing aircraft sortie and hours that generated the noise levels shown here.

Key: dBA = A-weighted decibels; DNL = Day-Night Average Sound Level; Ldnmr = Onset-Adjusted Monthly Day-Night Average Sound Level; MOA = Military Operations Area; R = Restricted Area; SUA = Special Use Airspace.

3.5 Land Use

"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, wilderness areas), while privately owned lands are infrequently protected for wilderness 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 wilderness will both appear as forest-covered, but they have different uses). Natural land use categories include state and national forests, state and national parks, wilderness 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 recreational opportunities and public access, or provide for the management of public lands. Noise-sensitive land uses also include residences, hospitals, nursing homes, schools, churches, and outdoor amphitheaters and sports arenas.

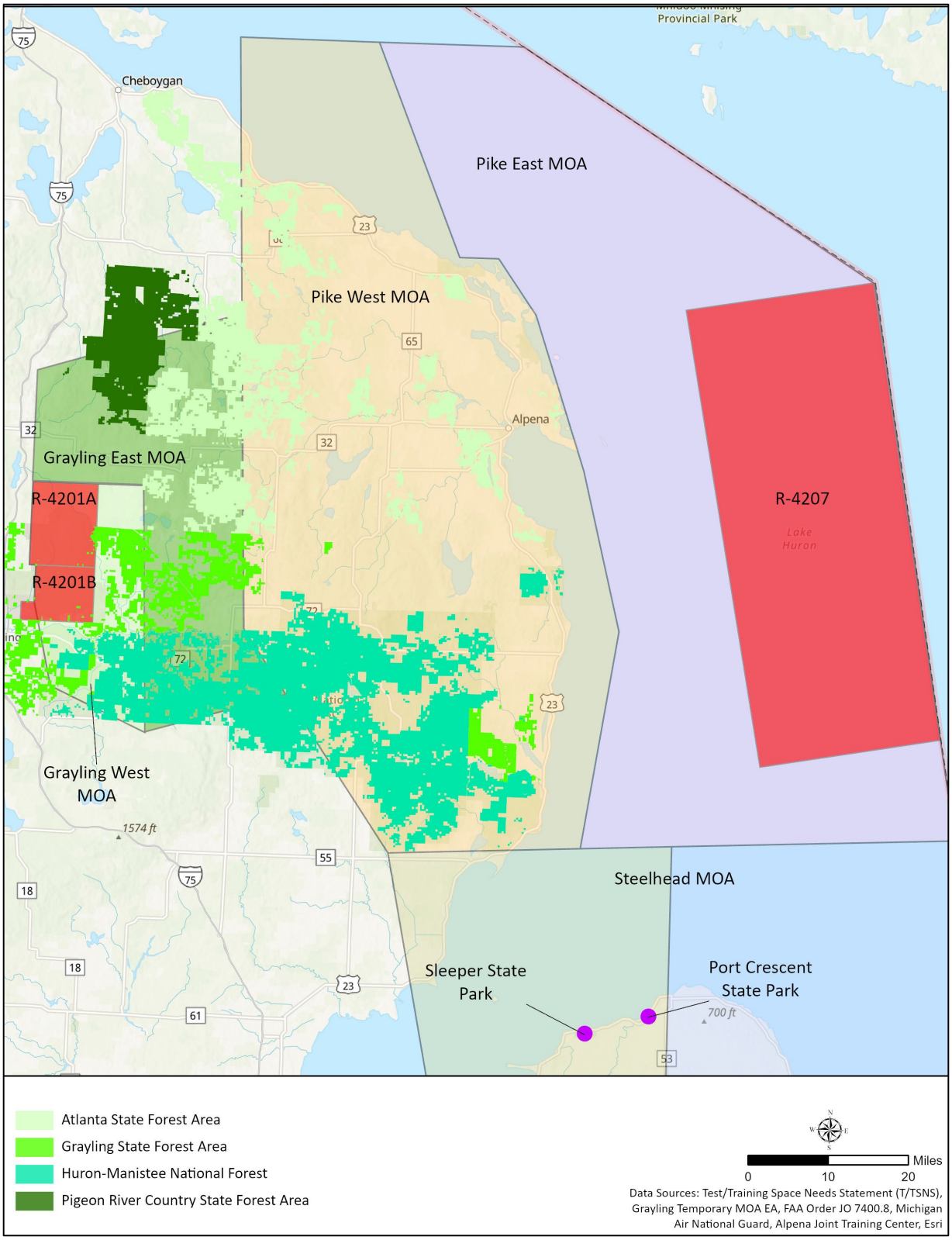
For this EA, land use is described generally beneath the MOAs, with more emphasis on the land uses under the proposed low MOAs and VRs.

Regional Land Use

Several recreational areas lie beneath the Alpena SUA Complex including the Atlanta State Forest Area, Grayling State Forest Area, the Huron-Manistee National Forest, and the Pigeon River County State Forest (see Figure 3-2). These forests contain hiking trails and campgrounds, and the Pigeon River County State Forest has free-roaming elk herds. The Atlanta State Forest Area is 272,399 acres located between the cities of Alpena and Gaylord north of Michigan Highway 32 (USGS, 2021). This forest area is underneath the existing Grayling Temporary MOA and Pike West MOA. Grayling State Forest Area is 170,739 acres and dispersed underneath the existing Grayling Temporary MOA, Pike West MOA, and 400 to 500 acres under R-4201 (USGS, 2021). The Huron-Manistee National Forest encompasses 978,900 acres between the cities of Oscoda and Grayling; this area is underneath the existing Grayling Temporary MOA and Pike West MOA (USGS, 2021). The Pigeon River County State Forest is 98,104 acres, northeast of Gaylord and underneath the existing Grayling Temporary MOA (USGS, 2021). Noise-sensitive land uses such as hospitals, schools, and residences are located throughout the region beneath the Alpena SUA, but mostly within municipalities. For example, the city of Grayling has a hospital, several schools and churches, and residential areas. Cities such as Alpena and Gaylord have medical centers, schools, churches, and residences.

The interior land underneath the Steelhead MOA is dominated by farmland with small municipalities. Along the Lake Huron shoreline, there are scenic areas, parks (such as the Albert E. Sleeper and Port Crescent State Parks), and cultural resource areas (such as the Bay Port Historic Commercial Fishing District and the Tawas Point Lighthouse). Noise-sensitive land uses under the Steelhead MOA are located mostly along the shoreline and within the municipalities.

Figure 3-2 Forest Areas Within and Adjacent to Alpena SUA Complex



3.6 Water Resources

This discussion of water resources in the study area includes a general overview of surface and coastal water resources below the proposed airspace changes. As the Proposed Action does not involve construction activities, there would be no potential for dredge/fill or other impacts on wetlands or development within any regulatory floodplains; therefore, wetland and floodplain resources are not discussed in detail. The Proposed Action would not involve long-term changes in water consumption, so groundwater resources are also not discussed in detail.

Watershed and Surface Water

The eastern portion of the proposed Alpena SUA changes are located above Lake Huron in northern and eastern Michigan. The remaining portions are located above several watersheds, most of which ultimately drain into Lake Huron (see watershed map in Figure A-4 and watershed information in Table A-8, both in Section A.8).

Coastal Resources

The Coastal Zone Management Act of 1972 established national policy to preserve, protect, develop, restore, or enhance resources in the coastal zone, including the Great Lakes. Federal agencies have an obligation to implement actions within the coastal zone that are compatible to the maximum extent practicable with the enforceable policies of a state's federally approved coastal management program. Michigan's coastal zone extends a minimum of 1,000 feet from the ordinary high-water mark. The boundary extends further inland in some locations to encompass coastal lakes, river mouths, and bays; floodplains; wetlands; dune areas; urban areas; and public park, recreation, and natural areas. The detailed list of federal actions and state statutes is on the EGLE's website (EGLE, 2021). As a federal agency, the NGB is required to determine whether its proposed activities would affect the coastal zone. This takes the form of a consistency determination, a negative determination, or a determination that no further action is necessary.

Some portions of airspace-related activities would occur over Michigan's coastal zone (i.e., proposed Steelhead North, East, and South MOAs are over portions of the coastal zone in Iosco, Arenac, Tuscola, Huron, and Sanilac Counties as well as the existing Pike East and Pike West MOAs over portions of Presque Isle, Alpena, Alcona, and Iosco Counties). However, airspace-related changes would not conflict with the enforceable policies of Michigan's coastal management program. A negative determination stating that the activity would not affect coastal uses or resources will be sent to EGLE pursuant to Section 307 of the Coastal Zone Management Act; see Appendix C for materials.

Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with characteristics that provide special natural, cultural, or recreational value. Section 2(a)(ii) of the Wild and Scenic Rivers Act allows the Secretary of the Interior to designate a river if a state governor requests designation; however, more commonly, Congress designates most rivers into the National Wild and Scenic Rivers System. The Au Sable Wild and Scenic River in Oscoda and Alcona Counties is located below the proposed Pike West MOA. However, no ground-disturbing activities associated with the project are located within or adjacent to any Wild and Scenic Rivers.

3.7 Biological Resources

Biological resources include native or naturalized plants and animals and the habitats in which they occur. These include vegetation; wildlife; and threatened, endangered or sensitive species in a given area. Biological resources are integral to ecosystem integrity. The existence and preservation of biological resources are intrinsically valuable to society for aesthetic, recreational, and socioeconomic purposes. This section provides an overview of the natural ecological systems and protected species within the project area.

Vegetation and Forestry

The eastern portion of the Alpena SUA Complex is located above Lake Huron. On the western portion, the proposed Grayling East, Grayling West, and Pike West MOAs, as well as the proposed MTRs, are located over the Northern Lakes and Forests Level III Ecoregion. On the southern portion, the Steelhead MOAs are located over the Southern Michigan/Northern Indiana Drift Plains Level III Ecoregion (USEPA, 2021a). Ecoregions are hierarchical levels developed to describe and differentiate ecosystems based on categories of characteristics.

The Northern Lakes and Forests ecoregion is typically nutrient-poor glacial soils with coniferous and northern hardwood forests, moraine hills, many lakes, and sandy outwashes. Typical forest species found here are sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), paper birch (*Betula papyrifera*), aspen (*Populus* sp.), balsam fir (*Abies balsamea*), eastern white pine (*Pinus strobus*), and red pine (*Pinus resinosa*) (Wilken et al., 2011).

The Southern Michigan/Northern Indiana Drift Plains ecoregion is typified by many lakes and marshes as well as a diversity of soils and land uses. Agricultural uses are more common in this region as opposed to the Northern Lakes and Forests. Typical vegetation includes oak–hickory (*Quercus* sp.–*Carya* sp.) forests, beech (*Fagus* sp.) forests, and forested wetlands. Oaks, shagbark hickory (*Carya ovata*), sugar maple, and beech are the most common species.

Wildlife

The Northern Lakes and Forests ecoregion has an abundance of diverse environments that provide habitats for a variety of wildlife species including black bear (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), lynx (*Lynx rufus*), and snowshoe hare (*Lepus americanus*) (Wilken et al., 2011). The Southern Michigan/Northern Indiana Drift Plains ecoregion is similarly diverse and supports white-tailed deer, coyote (*Canis latrans*), red fox (*Vulpes vulpes*), North American beaver (*Castor canadensis*), North American river otter (*Lontra canadensis*), and American mink (*Neovison vison*) (Wilken et al., 2011). Protected wildlife species that may be present are discussed under *Threatened and Endangered Species*.

Wildlife surveys performed in 2009 and 2020 at Alpena CRTC and Camp Grayling indicated that the most common species around the installations were Virginia opossum (*Didelphis virginiana*), eastern gray squirrel (*Sciurus carolinensis*), coyote, and common raccoon (*Procyon lotor*) (NGB, 2009; NGB, 2020a). The results of a bat survey performed in 2019 and finalized in 2020 noted that five bat species were observed: big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and little brown bat (*Myotis lucifugus*) (NGB, 2020b). None of the bat species observed are federal- or state-listed as threatened or endangered.

Migratory Birds

Migratory birds, as listed in 50 CFR 10.13, are ecologically and economically important. The Migratory Bird Treaty Act of 1918 (Public Law 65-186; 16 USC 703 et seq.) prohibits the take of migratory birds and their nests, eggs, parts, or products without the appropriate permit and provides enforcement authority and penalties for violations. In 50 CFR 21.15, incidental take of migratory birds for military readiness activities is authorized, provided the action proponent confers with USFWS to develop and implement appropriate conservation measures to minimize or mitigate negative effects, if the action would adversely affect the sustainability of a population of a migratory bird species.

The proposed airspace changes are located in the Mississippi Flyway, one of four migratory flyways over the United States (Lincoln et al., 1998). The Mississippi Flyway is most heavily used by waterfowl during spring and fall migration. According to the USFWS Information for Planning and Consultation (IPaC) database accessed on July 5, 2022, there are 26 migratory birds listed as USFWS Birds of Conservation Concern for the proposed MOAs, including the bald eagle (*Haliaeetus leucocephalus*) and red-headed woodpecker (*Melanerpes erythrocephalus*).

Bald Eagles

The Bald and Golden Eagle Protection Act of 1940 (Public Law 87-884; 16 USC 668a-d) prohibits the taking or harming (i.e., harassment, sale, or transportation) of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their eggs, nests, or young, without the appropriate permit. In general, eagles (both bald and golden eagles) are recognized as one of the more hazardous wildlife species for aircraft operations by the FAA (NGB, 2009).

According to National Bald Eagle Management Guidelines (USFWS, 2007), bald eagles in northern Michigan begin nesting in January. Egg laying and incubation occurs in April, hatching in May, and fledging of young is completed by late July. The Integrated Natural Resource Management Plan for Alpena CRTC states that bald eagles are known to nest near Alpena CRTC, and resident eagles have used the installation for migration or foraging (MIANG, 2018). In addition, there are published special operations procedures for the existing VRs that identify the exact location of bald eagle nests and the time of year and vertical and horizontal distances to avoid them.

Threatened and Endangered Species

The Endangered Species Act of 1973 was enacted to "conserve threatened and endangered species and the ecosystems on which those species depend." USFWS has legislative authority to list and monitor the status of species whose populations are considered imperiled. Regulations supporting the Endangered Species Act are codified and regularly updated in 50 CFR Part 17. A discussion of federal-listed species found within the footprint of the proposed airspace changes is included below.

Under Michigan Act 451 of 1994, commonly called the Natural Resources and Environmental Protection Act (NREPA), in Part 365, Endangered Species Protection, "a person shall not take, possess, transport . . . fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from MDNR, Wildlife Division. The State of Michigan maintains a list of threatened and endangered species, which they define as "a native species or subspecies of bird, mammal, fish, amphibian, reptile, or

plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." A list of the state-listed species that have been recorded within the counties under the Alpena SUA Complex is included in Appendix A, Section A.9.

The known or expected range of federal-listed species in the area under the proposed MOAs includes ten animal species (Indiana bat [*Myotis sodalis*], northern long-eared bat [*Myotis septentrionalis*], piping plover [*Charadrius melodus*], red knot [*Calidris canutus rufa*], eastern massasauga [*Sistrurus catenatus*], northern riffleshell [*Epioblasma torulosa rangina*], Hine's emerald dragonfly [*Somatochlora hineana*], Hungerford's crawling water beetle [*Brychius hungerfordi*], Karner blue butterfly [*Lycaeides melissa samuelis*], and monarch butterfly [*Danaus plexippus*][candidate species]) and five plant species (Houghton's goldenrod [*Solidago houghtonii*], Michigan monkey-flower [*Mimulus michiganensis*], dwarf lake iris [*Iris lacustris*], eastern prairie fringed orchid [*Platanthera leucophaea*], and pitcher's thistle [*Cirsium pitcher*]), according to the USFWS IPaC database, accessed on July 5, 2022. Critical habitat is mapped for Hine's emerald dragonfly and piping plover, though no ground-disturbing activities are proposed that could affect mapped critical habitat. The IPaC report is in Appendix D.

The USFWS IPaC database noted that the Kirtland's Warbler Wildlife Management Area is under some of the proposed SUAs. The Wildlife Management Area consists of 125 separate sites totaling 6,684 acres located throughout jack pine forest habitat in the northern Lower Peninsula of Michigan. Kirtland's warbler (*Dendroica kirtlandii*) was delisted from the Endangered Species Act in 2019, and is state-listed as endangered. Several of these management areas are under the proposed Graying East and West MOAs; none are under the proposed Steelhead Low MOAs. There are no ground-disturbing activities under the Proposed Action that could affect the Wildlife Management Area.

3.8 Cultural Resources

Cultural resources include archaeological sites; historic buildings, structures, and districts; and human-made or natural features important to a culture, subculture, or community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of cultural identity and traditions.

More information on the regulatory setting for cultural resources is included in Appendix A, Section A.12.

The area of potential effects (APE) for cultural resources is the geographic area or areas within which an undertaking (project, activity, program, or practice) may cause changes in the character

or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. The APE is defined as the area underneath the proposed airspace modifications.

Airspace

A review of the National Register of Historic Places (NRHP) and state Historic Register determined there were hundreds of historic properties underneath the MOAs and the proposed VRs. Hundreds of archaeological sites are also located underneath the proposed MOAs and VRs (K. Kolokithas, Personal communication, 2021). These include properties within Huron, Iosco, Sanilac, Otsego, and Crawford Counties. Historic properties include nineteenth-century residences and commercial buildings (e.g., churches, warehouses, stores); bridges; lighthouses such as the Sturgeon Point Light Station in Alcona County; shipwrecks such as the Pewabic Shipwreck and the Grecian Shipwreck sites in Lake Huron and within the Pike East MOA; archaeological sites such as the Sanilac Petroglyphs in Sanilac County; and prehistoric and historic period archaeological sites. Shipwrecks in Lake Huron are part of the Thunder Bay National Marine Sanctuary and Underwater Preserve, which is primarily within the Pike East MOA. There are approximately 116 sunken ships within the Sanctuary, which extends north-south from the western boundary of Presque Isle County to the southern boundary of Alcona County, and east from the Michigan shore to the international boundary with Canada. Ships in the Sanctuary range in date from 1846 to 1954.

3.9 Socioeconomics and Environmental Justice

This section describes the population demographics, employment characteristics, economic activity, and related data providing key insights into the socioeconomic conditions that might be affected by a proposed action. Because of the large area the Alpena SUA comprises, and the lack of anticipated population or economic drivers associated with the action (i.e., no additional employment or long-term expenditures), the study area for socioeconomics is focused on the areas beneath the low-altitude SUA that would be established as part of the action. The socioeconomic information for the counties under the overall Alpena SUA is included in Appendix A, Section A.13.

The socioeconomic analysis also considers Environmental Justice and Children's Health and Safety to ensure no groups bear a disproportionate share of adverse environmental consequences. These analyses will also focus on the low-altitude SUA. Because the actions considered in this EA would result in noticeable increases in noise particularly under R-4201A/B, the area under this airspace is also considered for disproportionate impacts on minority and low-income populations and children.

Regional

Michigan's primary industry in 2020 was finance, insurance, real estate, rental, and leasing; this industry accounted for 18.8 percent of the Michigan Gross Domestic Product (GDP). The second largest industry in the state was manufacturing, which accounted for 13.8 percent of the state's GDP in 2020. The 2020 GDP in Michigan was $515,928.3 million, which was ranked 14th in the United States (BEA, 2020). The 2019 population of Michigan was 9,884,116, which was a 1.0 percent increase over the state's 2010 population. As a basis of comparison, the population of the entire United States increased by approximately 6.3 percent during the same time.

Low Altitude MOAs

The Proposed Action includes several MOAs that would allow flying at altitudes lower than 1,000 feet AGL, including Grayling West MOA, Steelhead Low North MOA, Steelhead Low East MOA, Pike East MOA, R-4201A/B, and VR-1601/VR-1602. The following counties are under this airspace:

- Alcona County (Pike East MOA)
- Alpena County (VR-1601/VR-1602 and Pike East MOA)
- Arenac County (Steelhead Low North MOA)
- Crawford County (Grayling West MOA and R-4201A/B)
- Huron County (Steelhead Low North MOA and Steelhead Low East MOA)
- Iosco County (Steelhead Low North MOA, Steelhead Low East MOA, and Pike East MOA)
- Montmorency County (Grayling West MOA and VR-1601/VR-1602)
- Ogemaw County (Grayling West MOA)
- Oscoda County (Grayling West MOA)
- Otsego County (Grayling West MOA, R-4201A, and VR-1601/VR-1602)
- Presque Isle County (Pike East MOA)
- Roscommon County (Grayling West MOA)
- Sanilac County (Steelhead Low East MOA)

The socioeconomic characteristics of the counties under the proposed low airspace are described in the following tables. The counties under the proposed low-altitude airspace areas decreased in population between 2010 and 2019, except for Otsego County. The population within these counties also have a higher percentage of residents aged 65 and over and a lower percentage of individuals aged 18 or younger as compared with the state and national populations, indicating that there may be a higher population of retirees within these counties. Table 3-4 provides an overview of the population characteristics of the counties under the proposed low airspace; data for Michigan and the United States are also provided for context.

Housing characteristics for the counties under the proposed low airspace, shown in Table 3-5, indicate a high percentage of owner-occupied housing units within the study area. The median rent of the renter-occupied housing units is lower than the median rent within Michigan and the United States.

Table 3-6 shows the employment and economic characteristics of the study area. Within the study area, Sanilac County has the highest civilian labor force, and Oscoda County has the lowest. The labor force for the counties was, on the whole, a smaller percentage of the overall county population when compared with Michigan and the Unites States, further indicating that there is a high number of retirees in the region. For example, the civilian labor force in Montmorency County is 35.5 percent of the total population, whereas the labor force in Michigan is 49.6 percent of the total population.

Table 3-4 Population Characteristics Under Proposed Low Airspace (2019)

County	2010 Population	2019 Population	Percent Change 2010–2019	Population Under 18 Years of Age (%)	Population Aged 65 and Over (%)
Alcona	11,238	10,405	-7.4%	12.6%	36.1%
Alpena	29,958	28,405	-5.2%	18.7%	23.9%
Arenac	16,487	14,883	-9.7%	18.1%	25.8%
Crawford	14,325	14,029	-2.1%	18.1%	25.8%
Huron	33,642	30,981	-7.9%	19.2%	25.9%
Iosco	25,893	25,127	-3.0%	16.6%	30.1%
Montmorency	9,760	9,328	-4.4%	14.8%	21.5%
Ogemaw	21,862	20,997	-4.0%	18.6%	26.3%
Oscoda	8,884	8,241	-7.2%	19.4%	27.6%
Otsego	24,445	24,668	0.9%	20.8%	21.7%
Presque Isle	13,380	12,592	-5.9%	15.5%	32.5%
Roscommon	24,932	24,019	-3.7%	14.8%	33.3%
Sanilac	44,010	41,170	-6.5%	21.4%	22.1%
Michigan	9,884,116	9,986,857	1.0%	21.5%	17.7%
United States	308,758,105	328,239,523	6.3%	22.3%	16.5%

(U.S. Census Bureau, 2019)
Note: 2019 data are the most recent data available from the U.S. Census Bureau.

Table 3-5 Housing Characteristics Under Proposed Low Airspace (2019)

County	Number of Housing Units	Owner-Occupied Housing Units (%)	Median Rent of Renter-Occupied Housing Units
Alcona	11,241	88.8%	$627
Alpena	16,076	77.9%	$627
Arenac	9,885	83.8%	$604
Crawford	11,258	81.2%	$735
Huron	21,332	80.9%	$609
Iosco	20,573	79.9%	$652
Montmorency	9,631	84.1%	$668
Ogemaw	16,252	81.4%	$701
Oscoda	9,282	85.3%	$750
Otsego	14,928	78.9%	$768
Presque Isle	10,496	88.8%	$542
Roscommon	24,611	82.0%	$684
Sanilac	23,155	78.7%	$678
Michigan	4,629,611	71.2%	$871
United States	139,684,244	64.0%	$1,062

(U.S. Census Bureau, 2019)
Note: 2019 data are the most recent data available from the U.S. Census Bureau.

Table 3-6 Employment and Economic Characteristics Under Proposed Low Airspace (2019)

County	Civilian Labor Force	Unemployment Rate	Per Capita Income	Median Household Income
Alcona	3,625	7.6%	$25,636	$40,484
Alpena	13,474	6.0%	$25,957	$43,363
Arenac	6,357	7.1%	$24,328	$42,290
Crawford	5,863	6.5%	$26,294	$47,977
Huron	14,559	4.6%	$27,852	$48,289
Iosco	9,818	7.2%	$25,264	$43,678
Montmorency	3,312	8.0%	$23,958	$41,772
Ogemaw	8,265	8.1%	$23,787	$40,373
Oscoda	3,152	10.3%	$24,889	$42,335
Otsego	11,495	5.8%	$27,234	$54,332
Presque Isle	5,043	7.2%	$28,103	$47,948
Roscommon	8,770	9.4%	$25,807	$42,054
Sanilac	18,979	6.0%	$25,871	$47,672
Michigan	4,948,824	5.9%	$31,713	$57,114
United States	163,555,585	5.3%	$34,103	$62,843

(U.S. Census Bureau, 2019)
Note: 2019 data are the most recent data available from the U.S. Census Bureau.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires federal agencies to consider the human health and environmental conditions in minority and low-income communities to ensure that any disproportionately high and adverse human health or environmental effects on these communities are identified and addressed.

Table 3-7 shows demographic information on race, ethnicity, and poverty status in the area under R-4201A/B, which would experience increased noise (refer to analysis in Section 4.4.1). For the environmental justice analysis, demographics are analyzed at the census tract (CT) level to get a better picture of the affected population. Information for Michigan and the United States are provided for context. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is notably greater than the general population (CEQ, 1997). The minority population within each affected CT is less than 10 percent, which is substantially lower than the minority populations for both the state of Michigan and the United States. The minority populations of all areas underlying R-4201A/B are much lower than in Michigan and the United States. A poverty area is defined by the U.S. Census Bureau as a CT where 20 percent or more of the residents have incomes below the poverty threshold (U.S. Census Bureau, 1995). One CT—CT 9603, under R-4201A/B—meets the definition of a poverty area with a poverty rate of 22.3 percent.

Protection of Children

Table 3-8 shows the population of children within the study area; there are no areas that have substantially greater populations of minors, as compared with the state and national populations. There are no schools or childcare facilities located under R-4201A/B.

Table 3-7 Minority and Low-Income Population Characteristics Under R-4201A/B (2019)

Geographic Area	Percent White[1]	Percent Black[1]	Percent Hispanic or Latino[2]	Percent Asian or Pacific Islander	Percent American Indian or Alaska Native	Percent of Individuals Below Poverty Level
Otsego County	94.2%	0.6%	1.9%	3.4%	0.9%	10.0%
CT 9504	97.1%	0.4%	0.8%	1.4%	0.3%	7.7%
CT 9505	96.1%	0.0%	1.1%	0.4%	0.5%	11.8%
Crawford County	94.1%	0.9%	2.2%	0.8%	0.8%	14.0%
CT 9601	95.8%	0.0%	1.5%	0.4%	1.0%	14.9%
CT 9603	93.2%	2.1%	3.0%	0.3%	0.0%	22.3%
Michigan	74.7%	14.1%	5.3%	3.4%	0.7%	13.0%
United States	60.1%	13.4%	18.5%	6.1%	1.3%	10.5%

(U.S. Census Bureau, 2019)
Notes: 2019 data are the most recent data available from the U.S. Census Bureau.
[1] Non-Hispanic or Latino. [2] Of any race.
Key: CT = Census Tract.

Table 3-8 Youth Population in the Study Area Under R-4201A/B (2019)

Geographic Area	Population Under 18 Years of Age (%)	Population Under 5 Years of Age (%)
Otsego County	21.1%	5.2%
CT 9504	16.5%	4.7%
CT 9505	18.8%	4.7%
Crawford County	18.1%	4.7%
CT 9601	15.3%	2.7%
CT 9603	22.6%	5.5%
Michigan	21.9%	5.7%
United States	22.6%	6.1%

(U.S. Census Bureau, 2019)
Note: 2019 data are the most recent data available from the U.S. Census Bureau
Key: CT = Census Tract.

Chapter 4. Environmental Consequences

This chapter presents the reasonably foreseeable environmental and socioeconomic effects resulting from the Proposed Action and alternatives, as detailed in Sections 2.1, 2.2, 2.3, and 2.4, on the affected environment described in Chapter 3. Analysis of environmental consequences is organized with all alternatives under each resource area.

4.1 Airspace Management

The study area for the Proposed Action includes the areas underneath the Alpena SUA Complex and aviation facilities and aircraft that are passing through that could be affected by changes in flight patterns and airspace availability. Impacts on airspace management are predicated to the extent that the Proposed Action would appreciably limit airspace access to many users; impose major restrictions on air traffic or adjacent airports; or cause conflicts or congestion for nonparticipating aircraft.

4.1.1 Proposed Action (Alternative A)

Under the Proposed Action, the Minneapolis ARTCC would remain the controlling agency for all SUA in the Alpena SUA Complex, including the new proposed MOAs. The scheduling and using agency would remain the Alpena CRTC for airspace in the Alpena SUA Complex except for R-4201, where the using agency would remain Camp Grayling. Shared-use procedures are specified in a LOA between the using agency and the controlling agency. Currently, there is a LOA among Minneapolis ARTCC, Cleveland ARTCC, Toronto Air Canada Centre, and Alpena CRTC regarding procedures for control of aircraft operations to, from, and within ATC Assigned Airspace Areas and MOAs. The LOA includes agency responsibilities, airspace activation, and deactivation procedures, including notification times to the controlling agency when the scheduled activity has changed, been canceled, or was completed for the day. Under the Proposed Action, the LOA would be updated to include the new MOAs and any necessary procedure revisions.

When any of the MOAs are not in use, they would be released to the controlling agency and made available to nonparticipating aircraft. As discussed in Section 3.1 (see also Table A-3 and Figure A-3 in Section A.1), numerous general aviation airports are in the study area. Most of these airports are adjacent to the SUA Complex, not underneath it, and consist of general aviation traffic. When a MOA is being used, nonparticipating IFR traffic may be cleared through if IFR separation can be provided by ATC. Otherwise, ATC would reroute or restrict nonparticipating IFR traffic. To alleviate potential adverse impacts on IFR traffic under the Proposed Action, the MIANG would enter into a LOA with Minneapolis ARTCC and Cleveland ARTCC, to establish procedures for real-time separation and use of the airspace to allow civilian IFR aircraft access through the MOAs. Aircraft flying VFR can fly through an active MOA. VFR aircraft use see-and-avoid procedures, which states that the aircraft shall maintain vigilance so as to see and avoid other aircraft. Pilots can also contact the FAA Flight Service Station prior to flight for any pertinent NOTAMs or restrictions pertaining to their area of intended operation (FAA, 2021). The airspace legal description requirement would include that the airspace must be activated by NOTAM at least four hours in advance.

As previously discussed, there are currently eight VRs that access R-4201 and Grayling Range from Alpena CRTC. Under the Proposed Action, two new VRs would be established between R-4201 and Alpena CRTC. During LFEs, there is an increase in the amount of military helicopter traffic between Alpena CRTC and Camp Grayling on approved Army routes to both the north and south of R-4201A. This turns off the MTR option for fixed-wing aircraft to ingress and egress the range at low altitudes during the prime training months of July and August. The proposed VRs would allow for military deconfliction between fixed-wing and rotary-wing aircraft during LFEs. Consequently, Alpena CRTC VR utilization is not expected to change from current levels, and the Proposed Action would result in beneficial effects during LFEs. Black Talon currently schedules and deconflicts all VRs (and all MTRs) located within Michigan; the scheduling of two additional VRs into and out of Grayling Range, but not additional aircraft utilization, would have no significant impacts.

Nonparticipating aircraft are not prohibited from flying within a VR; however, extreme vigilance should be exercised when conducting flight through or near these routes. Pilots should contact Flight Service Stations within 100 nautical miles of a particular VR to obtain current information or route usage in their vicinity (FAA, 2021). Information available includes times of scheduled activity, altitudes in use on each route segment, and the route width.

Under the Proposed Action, the ceiling of R-4201B would be raised from 9,000 feet to 23,000 feet MSL to match the ceiling of R-4201A. As a result, as summarized in Table 2-3, there would be an increase in sortie hours in R-4201B as compared to existing conditions. There would also be a decrease in hours in R-4201A. Under the Proposed Action, R-4201A/B would be used in conjunction more frequently. The total number of hours in R-4201A/B is 869 under existing conditions and 791 under the Proposed Action. Therefore, the total number of annual hours in R-4201 is not expected to substantially change. Given that Grayling Air Gunnery Range staff are already accustomed to scheduling aircraft operations in the range and airspace, and changes to the airspace under the Proposed Action are not expected to be substantial, no impacts on aircraft management are expected.

Nonparticipating aircraft are not allowed to fly through restricted areas (i.e., R-4201) when they are active. When the restricted area is active, ATC issues a clearance that ensures nonparticipating aircraft avoid the restricted airspace unless it is on an approved altitude reservation mission or has obtained its own permission to operate in the airspace and so informs the controlling facility. If the restricted area is not active and has been released to the controlling agency, ATC allows the aircraft to operate in the restricted airspace without issuing specific clearance for it to do so (FAA, 2021).

Currently, there are 9,138 square nautical miles of airspace in the Alpena SUA Complex, not including the Grayling Temporary MOA. Under the Proposed Action, the amount of airspace would increase to 12,290 square nautical miles. The increase in the amount of airspace is partly based on the need for the Proposed Action to have airspace that is of sufficient, contiguous size and altitude to accommodate LASDT and LOWAT tactics. This includes flying operations such as close air support, electronic attack, or chaff and flare deployment; depending on the training that is required, some SUAs would be requested more than others. The Grayling West MOA would be adjacent to R-4201A/B and would be used in coordination with training activities in the restricted area. Hersey MOA would be returned to the NAS. Although the change in flying operations and the amount of available airspace is not parallel, given the amount of airspace available, the proposed airspace could accommodate the estimated aircraft capacity.

The change in hours for the existing SUAs was compared to the estimated hours for the proposed SUAs. The number of hours in the Steelhead MOA would decrease by approximately 27 percent compared to existing conditions (refer to Table 2-9); Pike West MOA would increase by approximately 22 percent (refer to Table 2-10); Pike East MOA would increase by approximately 12 percent (refer to Table 2-11); and Hersey MOA would be returned to NAS (hours in R-4201 are discussed above).

Considering that civilian aircraft fly 365 days a year, day and night, there are 8,760 hours available in a year. When not in use, MOAs would be released to the controlling agency and made available to nonparticipating aircraft. Given this, the total number of hours available for civilian aircraft were compared to the projected number of hours in each proposed airspace as summarized in Table 2-3. Using this methodology, the proposed Grayling West MOA would be used by participating aircraft approximately five percent of the total available hours; the proposed Grayling East MOA would be used approximately three percent; the proposed Steelhead Low North and Steelhead Low South MOAs would each be used approximately two percent; and the proposed Steelhead Low East MOA would be used approximately four percent. Conversely, there would be times when surges in training activities would occur, and also periods of low utilization. In addition, the total number of

annual hours includes late-night hours when most civilian aircraft are not flying. However, even given these factors, the estimated percentage of time that the proposed airspace would be used by participating aircraft is fairly low.

Several airports are underneath the proposed Grayling East MOA, including Atlanta Municipal Airport, Oscoda County Dennis Kauffman Memorial Airport, Eagle II Airport, and Lost Creek (see also Table A-3 and Figure A-3 in Section A.1). The floor of the Grayling East MOA would be 10,000 feet MSL, so adverse effects on flights in and out of these airports are not expected. There are no airports directly underneath the proposed VRs; however, Atlanta Municipal Airport and Hillman Airport are located to the south of the proposed VR width.

Airports were identified under the proposed MOAs with floors that would be considerably lower than the existing SUA floors on-land (i.e., Steelhead Low North MOA, and Steelhead Low East MOA). There are no airports directly underneath the proposed Grayling West MOA. Grindstone Air Harbor Airport is located on the coast of Lake Huron and underneath the proposed Steelhead Low East MOA (which has a floor of 500 feet AGL). Grindstone Air Harbor Airport is a transient general aviation airport with approximately 50 operations per year (AirNav, 2021a). The estimated number of sorties in the Steelhead Low East MOA is 1,020 per year. Given that the180 FW and 127 WG train approximately 264 flying days per year, there would be about four sorties per day on average in the Steelhead Low East MOA. In addition, in the Steelhead Low MOAs, participating aircraft would fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline only between May 15 and September 15. F-35 aircraft would not utilize the Steelhead Low MOAs under the Proposed Action. Therefore, for four months of the year, the floor of the Steelhead Low East MOA above Grindstone Air Harbor Airport would be 1,500 feet AGL. As a result, there would be a low number of operations at the Grindstone Air Harbor Airport and in the Steelhead Low East MOA, and measures would be implemented within the Steelhead Low MOAs, as discussed.

Huron County Memorial Airport is underneath the Steelhead Low South MOA. This airport consists of general aviation aircraft and has approximately 121 aircraft operations per week (AirNav, 2021b). To alleviate potential adverse effects on air traffic under the Proposed Action, the shape and altitude of Steelhead Low South MOA was designed to enable civil flight operations to arrive and depart Huron County Memorial Airport without entering military airspace. A seven nautical mile arc was incorporated into the proposed MOA design around the airport so that the floor of the MOA would be 4,000 feet MSL in this region. This enables aircraft to arrive and depart using their current published instrument approach procedures.

The Alpena CRTC is currently located at the Alpena County Regional Airport, which is underneath Pike West MOA. Under the Proposed Action, there would not be substantial changes to the Pike East or West MOAs. Alpena CRTC departures, arrivals, and training from Alpena County Regional Airport would not change substantially from current procedures. In addition, the aircraft operations procedures to and from the SUA would remain the same in an updated LOA. No significant impacts to Alpena County Regional Airport are expected from the Proposed Action.

There are a few airports within a 50-nautical-mile radius of the Alpena SUA Complex with a small percentage of commercial flights, such as Bishop International Airport, which is approximately 40- to 50-nautical miles south. However, airports with a large amount of commercial traffic, such as Detroit Metropolitan Wayne County Airport, are approximately 80 nautical miles from the Alpena

SUA Complex. Given the distance, most commercial flights arriving or departing to Detroit would likely be above the ceiling of the MOAs (18,000 feet MSL). However, if the aircraft needed to fly through the MOAs when active, as previously discussed, ATC would provide IFR separation.

Coordination between the agencies for use of military airspace and other training assets is an ongoing activity. Considerable planning has occurred to anticipate needs, identify potential problems, and develop workable solutions for issues associated with use of these airspace and associated requirements. Such planning, continuing after implementation of the Proposed Action, would ensure that impacts associated with use of airspace and airspace management requirements are minimal.

4.1.2 Alternative B: No Steelhead Low MOAs

The scheduling and using agencies described under the Proposed Action in Section 4.1.1 would remain the same under Alternative B. Aircraft utilization would not vary substantially regardless of which alternative is selected. Under Alternative B, there would likely be more utilization in the Steelhead MOA and Grayling West MOA than is proposed for the Steelhead Low MOAs under the Proposed Action. The SUAs in the Alpena SUA Complex would be used together, similar to the Proposed Action; Grayling MOAs, R-4201, Pike MOAs, Steelhead MOA, and the ATCAAs would be used in conjunction to approximate the SUA volume requirements for complex missions. Therefore, a substantial change in the number of aircraft sorties and hours is not expected.

Under Alternative B, airports underneath and adjacent to the Steelhead Low MOAs would experience fewer impacts than under the Proposed Action given that the floor of the Steelhead MOA would remain at 6,000 feet MSL. Less chaff and flare would be used in training than under the Proposed Action. No other changes would be expected compared to the impacts described under the Proposed Action. Impacts on airspace management would not be significant.

4.1.3 Alternative C: No Grayling East or West MOAs

The scheduling and using agencies described under the Proposed Action in Section 4.1.1 would remain the same under Alternative C. Aircraft utilization would not vary substantially regardless of which alternative is selected. Alternative C would not satisfy part of the need to provide connecting airspace from the existing SUA complex to the Grayling Range for continuity. This alternative would also limit the amount of low-altitude airspace closer to the Grayling Range; therefore, there would be an increase in flight time and fuel usage from Alpena CRTC as compared to the Proposed Action. There would likely be more utilization in the Steelhead Low MOAs as compared to the Proposed Action, and Hersey MOA would be available as an alternative when the weather was unfavorable. However, a substantial change in the overall number of aircraft sorties and hours is not expected.

Under Alternative C, civilian airports underneath and adjacent to the Grayling East and West MOAs would experience fewer impacts than under the Proposed Action. Less chaff and flare would be used in training than under the Proposed Action. No other changes would be expected compared to the impacts described under the Proposed Action. Impacts on airspace management would not be significant.

4.1.4 Alternative D: No Action Alternative

Under Alternative D, airspace management would remain as described in Section 3.1, existing conditions. The need to provide sufficient, contiguous size and altitude to accommodate LASDT and

LOWAT tactics and standoff weapons employment, to support ANG Instruction 10-110 would not be met. Components such as implementing the proposed VRs to allow for military deconfliction would not occur, resulting in minor adverse impacts on airspace management. Civilian airports underneath and adjacent to the Alpena SUA Complex would experience the same impacts as under current conditions and fewer impacts compared to the Proposed Action. Impacts on airspace management would not be significant.

4.2 Safety

Any increase in safety risks without risk management would be considered an adverse effect on safety. A proposed action could have a significant effect with respect to health and safety if it were to substantially increase risks associated with the safety of construction and installation personnel, contractors, or the local community; substantially hinder the ability to respond to an emergency; or introduce a new health or safety risk for which Alpena CRTC or Grayling Range is not prepared or does not have adequate management or response plans in place.

4.2.1 Proposed Action (Alternative A)

Aircraft Safety

The primary public concern regarding aircraft safety is the potential for aircraft accidents or mishaps. An increase in aircraft flight activities is often associated with an increased risk of aircraft mishaps. Although many investigations have been conducted to determine a direct cause and effect relationship between operational levels and aircraft mishaps, results are generally inconclusive because so many other unpredictable hazard factors (e.g., weather, operating environments, technical failures, terrorist actions, and pilot proficiency) can contribute to whether an accident occurs or is prevented (Congressional Research Service, 2003).

In probability analysis, an aircraft mishap is a low-probability, high-consequence risk because pilots are trained, and aircraft designed, to ensure that aircraft accidents are rare events. Under the Proposed Action, total sorties within SUA would increase within the proposed SUA expansion, to include the Grayling East and West MOAs and the three new Steelhead Low MOAs. Most aircraft accidents occur during takeoff or landing; second to these operations are mishaps involving high-performance maneuvering, such as operations that typically occur in a MOA. Within the Alpena SUA Complex, R-4201/Grayling Range is the primary training range for the units. The 180 FW and 127 WG use Grayling Range daily due to its proximity and available training assets. Training assets include air gunnery range target areas, helicopter landing zones, and restricted airspace that are used in conjunction for military training. Established in 1917, the Grayling Range has a long history of air and ground operations. The Grayling Air Gunnery Range Manual (2020) has specific procedures and instructions for air and ground operations, weapons expenditures and safety including airspace violations, emergency response, fire response, and medical emergency. The ANG has implemented and would continue to implement operational and administrative controls to ensure operational safety.

The controlling agency and using agency would stay the same for the airspace within the Alpena SUA Complex and R-4201. Given the increase in airspace that would occur and the well-established procedures that are already in place, the added potential for aircraft mishaps would be negligible as compared to the No Action Alternative.

Bird-aircraft strikes present a potential safety issue due to resident and migratory bird populations. The Alpena SUA Complex is within the Mississippi Flyway, one of four migratory flyways over the United States. ANG uses tools such as the Avian Hazard Advisory System (2015) to generate projected and geospatially confirmed bird data for use in military airspace. Alpena CRTC's Bird-/ Wildlife-Aircraft Strike Hazard (BASH) Plan (2020a) incorporates measures for reducing the potential for bird-aircraft strikes, including establishing a Bird Hazard Working Group, establishing aircraft operating procedures to avoid high-hazard situations, and providing guidelines for dispersing birds when they are present around the airfield. Additional information is in Section 4.7.

The proposed Grayling West, Steelhead Low North, and Steelhead Low East MOAs would each have a floor of 500 feet AGL, and the proposed VR-1601/1602 would have a floor of 300 feet AGL. Clusters of windmill turbines are within the proposed Steelhead Low North and Steelhead Low South MOAs with heights ranging between 1,068 feet and 1,362 feet above MSL (approximately 427 feet to 612 feet AGL), as well as several other height obstructions in the Steelhead Low East MOA around 500 feet AGL, as noted on the Detroit Sectional Aeronautical Chart (FAA, 2022a). Several height obstructions ranging from 315 feet to 649 feet AGL are within the proposed VR-1601/1602 width, as noted on the Lake Huron Sectional Aeronautical Chart (FAA, 2022b). No height obstructions above 500 feet were noted within the Grayling West MOA. Pilots would continue to follow low-level guidance and remain 1,000 feet above the highest obstacle and 2,000 feet laterally when over congested or populated areas, as well as 500 feet above all known or observed antennas, turbines, and other obstacles (14 CFR 91.119).

The current LOA among Minneapolis ARTCC, Cleveland ARTCC, Toronto Air Canada Centre, and Alpena CRTC authorizes lights out operations within the Alpena SUA Complex with certain procedures. Lights out operations may be conducted provided all appropriate coordination and safety procedures are followed, including that the NOTAM identifies lights out operations, aircrews operating lights out must alter their course to remain clear of nonparticipating traffic, and aircrews indicate their flight plan by noting lights out and the airspace. Lights out flying in MOAs requires an evaluation of the MOA and surrounding airspace. If the evaluation is favorable, the MOA is publicly identified as approved for lights out flight operations by the FAA. To conduct those operations, the FAA issues a waiver to several Federal Aviation Regulations and mandates terms and conditions whereby lights out flying can be conducted with the safety of nonparticipating aircraft in mind.

Pilots would continue to conduct preflight planning, participate in low-altitude awareness training, and use in-flight warning systems to ensure low-altitude training is conducted safely. The MIANG would enter into a Letter of Agreement with Minneapolis Center and Cleveland Center to establish procedures for real-time separation and use of the airspace to allow civilian IFR aircraft access through the MOAs. Implementation of the Proposed Action would introduce negligible aircraft safety risks beyond the existing conditions. No significant impacts are anticipated.

Chaff and Flare

Chaff and flare expenditures would increase by approximately 20 percent under the Proposed Action (refer to Table 2-17 for quantities of existing and proposed chaff and flare use). As used in Air Force training, these components would be deposited in the environment at rates that are nontoxic and undetectable (USAF, 1997). Safety risks have been examined in other studies and found to be extremely low; see inset on next page (USAF, 2011).

Due to the extremely high temperatures at which flares burn upon ignition coupled with minimum flare employment altitudes, the use of flares presents a small risk for fire. Fires can have a wide range of environmental effects. Immediate fire effects can threaten human health and safety, destroy surface vegetation, destroy wildlife and eggs, alter seeds and microbes in the soil, temporarily disrupt travel, and produce smoke. Delayed effects could alter mineral or pH levels in the soil, increase presence of invasive vegetation or insect species, increase vulnerability to wind and water erosion, or change wildlife habitats.

Existing military regulations require precautions to be taken to avoid injury or damage to persons or objects. This includes precautions for activities that increase the potential for fires, such as the release of flares. The area below the proposed Grayling West MOA is a prime wildfire area with large tracts of jack pine (*Pinus banksiana*) that can fuel volatile wildfires (see MDNR letter, July 15, 2021, Appendix B). At deployment altitudes greater than 1,500 feet AGL, a flare burns completely out before reaching the ground (USAF, 2011). Across most of the Alpena SUA Complex, no flares would be deployed below 2,000 feet AGL.

Chaff and Flare Safety Risks

The USAF Air Combat Command (2011) prepared a comprehensive report detailing the environmental effects of chaff and flare, including the following potential safety risks:

- inadvertent release or cloud drift clutters FAA, airborne radar, and satellite tracking
- power line arcing
- aircraft ingests chaff and affects engine efficiency
- chaff deployed near another aircraft, distracting pilot
- Class D Mishap from system malfunction (non-aircraft)
- High Accident Potential from system malfunction (non-aircraft)
- High Accident Potential from system malfunction (aircraft)
- injury from falling debris
- flare system malfunction

These potential safety risks from chaff and flare were found to be extremely low.

The NGB (2002) prepared a comprehensive EA analyzing chaff and flare deployment in ANG airspaces, including Pike and Steelhead MOAs, and determined that use of chaff and flare would be unlikely to significantly impact public safety. The quantities of chaff bundles and flares analyzed in the 2002 EA were higher than those proposed in this EA.

Within R-4201, flares may be deployed at 1,000 feet AGL, consistent with existing approved altitudes for the range. Air Force Instruction 11-214 would continue to be followed, including verifying current fire conditions prior to flare employment (ACC/A3TW, 2021). If necessary due to seasonal fire conditions, the altitude at which flares are deployed would be raised to 2,000 feet within R-4201 to decrease fire risk. Camp Grayling would continue to monitor and manage fire safety risks associated with training activities in accordance with existing plans and procedures.

Existing agreements and coordination efforts, such as wildland fire suppression, would remain in place or be revised as necessary to ensure continued ability to enable VFR aircraft to survey for and combat wildfires in forested areas. Therefore, the Proposed Action would present a low fire risk from increases in flare deployment. No significant impacts are anticipated.

4.2.2 Alternative B: No Steelhead Low MOAs

Effects on safety under Alternative B would be comparable to those described under the Proposed Action. The obstructions noted within the Steelhead Low North and East MOAs would have no bearing as these MOAs would not be established under Alternative B. Existing aircraft safety procedures, including chaff and flare use, would remain in place. Alternative B would result in a 10 percent increase in use of chaff and flare, compared with existing use. No significant impacts are anticipated.

4.2.3 Alternative C: No Grayling East or West MOAs

Effects on safety under Alternative C would be comparable to those described under the Proposed Action. Existing aircraft safety procedures, including chaff and flare use, would remain in place under Alternative C. Alternative C would result in a 10 percent increase in use of chaff and flare, compared with existing use. No significant impacts are anticipated

4.2.4 Alternative D: No Action Alternative

Under the No Action Alternative, the operating environment would remain comparable to those described in Section 3.2. No changes in safety risks would occur with continued use of the Alpena SUA Complex in its current configuration. No significant impacts are anticipated.

4.3 Air Quality

Clean Air Act, Section 176(c)—General Conformity—requires federal agencies to demonstrate that proposed activities would conform to applicable State Implementation Plans for attainment of NAAQS. Huron County in the study area is an orphan maintenance area for the revoked 1997 ozone NAAQS, meaning that total direct and indirect ozone emissions must be compared to the ozone maintenance thresholds specified in 40 CFR 93.153(b) to determine if the Proposed Action would be *de minimis*, or if a full Conformity Determination is required. Ozone *de minimis* thresholds are measured by its precursors, volatile organic compounds and nitrogen oxides. All other criteria pollutants are in full attainment with NAAQS, so the General Conformity Rule does not apply to those pollutants.

Impacts on air quality were evaluated for whether the alternative would contribute to a violation of the NAAQS. Per FAA Order 1050.1F, an alternative that causes pollutant concentrations to exceed one or more of the NAAQS for any of the time periods analyzed, or that increase the frequency or severity of any such existing violations would be significant. Air emissions were estimated using the DAF's Air Conformity Applicability Model (ACAM), Version 5.0.17b (AFCEC, 2022).

4.3.1 Proposed Action (Alternative A)

Appendix I contains the Record of Non-Applicability, the ACAM report showing record of conformity analysis, and the ACAM report showing detailed air conformity applicability background and methodologies for air emissions estimates.

Regional Criteria Pollutant Emissions

Implementation of the Proposed Action would expand airspace, particularly low airspace, within the Alpena SUA Complex. The approximate mixing height (i.e., above which changes in aircraft operation would have no or negligible discernable effects on ground-level air quality) is 3,000 feet AGL. The increase in available low airspace would change the distribution of sorties in the airspace, shifting some sorties from higher MOAs of baseline operations that are above the mixing height to proposed low MOAs below the mixing height. The proposed increase in aircraft sorties below 3,000 feet AGL would increase criteria pollutant emissions, particularly nitrogen oxides, across the region. The size of the total airspace available would also expand by 1,633 square nautical miles, so criteria air pollutants would be dispersed over a larger area. Long-term, steady-state air emissions with General Conformity applicability are summarized in Table 4-1.

Table 4-1 Steady-State Air Emissions (Calendar Year 2024+)

Pollutant	Action Emissions (ton/year)	General Conformity Threshold (ton/year)	General Conformity Exceedance (Yes or No)
Huron Co, Michigan (orphan maintenance area for revoked 1997 ozone standard) [1]			
VOC	0.550	100	No
NO_x	34.520	100	No
CO	3.100	—	—
SO_x	2.176	—	—
PM_{10}	3.789	—	—
$PM_{2.5}$	2.713	—	—
CO_2e	6,576.7	—	—

(AFCEC, 2022)

Note:

[1] To provide a maximum impact, all SUA aircraft changes were included within the Huron County ozone maintenance area; however, these emissions would be spread across the entire SUA, so actual emissions in Huron County would be much less than shown.

Key: CO = carbon monoxide; CO_2e = carbon dioxide equivalents; NO_x = nitrogen oxides; $PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers; PM_{10} = particulate matter less than or equal to 10 micrometers; SO_x = sulfur oxides; SUA = Special Use Airspace; VOC = volatile organic compounds.

Only ozone emissions (measured as volatile organic compounds and nitrogen oxides, which are ozone precursors) within Huron County must demonstrate conformity. The applicable *de minimis* threshold for ozone maintenance is 100 tons per year of either nitrogen oxides or volatile organic compounds; the change in estimated annual aircraft emissions of measured ozone precursors (i.e., nitrogen oxides or volatile organic compounds) would be below this threshold. The *de minimis* thresholds for most maintenance and nonattainment areas are 100 tons per year of any pollutant (see Table A-6 in Appendix A). Though the *de minimis* standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, and particulate matter do not formally apply to this action because it is fully in attainment for these criteria pollutants, they demonstrate that the projected long-term increases in air emissions from the Proposed Action would not be regionally significant. The only air quality monitor in the study area is in Huron County, under the proposed Steelhead Low East MOA. Ozone concentrations have not triggered any NAAQS violations since the promulgation of the latest ozone standard in 2015 (Table A-7 in Appendix A). Low-level flying below 3,000 feet in the Steelhead Low MOAs would produce nitrogen oxide and volatile organic compound emissions, which react to form ground-level ozone. Given the relatively minor increases in emissions from aircraft, the Proposed Action would not cause any pollutant concentrations to exceed NAAQS. Impacts would not be significant. Methodology and emissions for aircraft operations in SUA below the mixing height are in the detailed ACAM report in Appendix I.

Sensitive Airsheds

Seney Wilderness is the only Class I air quality area within 300 kilometers of the Proposed Action. Given the minor increases in criteria pollutant emissions and its distance, the Proposed Action would have no effect on air quality or visibility within Seney Wilderness. A brief discussion of visual resources is in Section A.11 of Appendix A.

Greenhouse Gas Emissions

Implementation of the Proposed Action would contribute directly to emissions of greenhouse gases, namely carbon dioxide, from the combustion of fossil fuels emitted during aircraft operations. Estimated long-term greenhouse gas emissions total approximately 6,577 tons (5,966 metric tons)

of carbon dioxide equivalents. There are currently no accepted standards to aid in determining significance of greenhouse gas; however, considering the minor effects the Proposed Action is projected to have from criteria pollutant emissions, the Proposed Action would have proportionally minor contributions to local and regional greenhouse gas emissions. Impacts would not be significant.

Chaff and Flare

Air quality issues associated with chaff and flare deployment include the potential for chaff to break down into respirable particle sizes and the possibility that hazardous air pollutants may be generated from pyrotechnic impulse cartridges used with some chaff models. The body of long-term research involving chaff particulate tests and health risk assessment suggests that these are not significant concerns on air quality (USAF, 2011).

4.3.2 Alternative B: No Steelhead Low MOAs

Effects on air quality under Alternative B would be comparable to those described in Section 4.3.1. However, without establishing the Steelhead Low North and East MOAs, which both introduce low-level airspace below the mixing height, regional emissions would be slightly lower than the Proposed Action because the overall time spent flying at low levels would be less. For example, if an F-16 sortie includes 20 minutes in Pike East MOA, 20 minutes in Pike West MOA, 15 minutes in Steelhead MOA, and 5 minutes in Steelhead Low North or East MOA under the Proposed Action, then that 5 minutes in the Steelhead Low North/East MOA would likely be redistributed under Alternative B to the Steelhead MOA, which is above the mixing height. This difference in emissions under Alternative B would be negligibly less than under the Proposed Action. Impacts would not be significant.

4.3.3 Alternative C: No Grayling East or West MOAs

Effects on air quality under Alternative C would be comparable to those described in Section 4.3.1. However, without establishing the Grayling West MOA, which introduces low-level airspace below the mixing height, regional emissions could be slightly lower than the Proposed Action because sorties would involve less time at low levels. The example of sortie distribution that is discussed under Alternative B would also occur under Alternative C. As a result, air emissions under Alternative C would be slightly less as compared to the Proposed Action. This difference in emissions would be negligible. Impacts would not be significant.

4.3.4 Alternative D: No Action Alternative

Under the No Action Alternative, air quality would remain comparable to what is described in Section 3.3. No changes in air emissions sources would occur with continued use of the Alpena SUA Complex in its current configuration. Impacts would not be significant.

4.4 Noise

The noise impact analysis is evaluated for a potential increase in the existing noise environment and whether effects on humans would occur such as annoyance, speech interference, sleep disturbance, hearing loss, or disruption to children's learning. FAA Order 1050.1F provides the FAA's significance threshold for noise: The action would increase noise by 1.5 dBA DNL or more for a noise-sensitive area that is already exposed to noise at or above the 65 dBA DNL noise exposure level, or that would be exposed at or above the 65 dBA DNL level due to a 1.5 dBA DNL or greater

increase, when compared to the No Action Alternative for the same timeframe (FAA, 2020c). For example, an increase from 65.5 dBA to 67 dBA DNL is considered a significant impact, as is an increase from 63.5 dBA to 65 dBA DNL. For air traffic airspace actions, the FAA considers "reportable noise" change-of-exposure at population centers by the following specified amounts: an increase of 3 dBA from 60 dBA to <65 dBA DNL, or an increase of 5 dBA from 45 dBA to <60 dBA. When determining significance from aircraft operations in SUAs, Ldnmr is the accepted noise metric. Ldnmr has an 11 dBA adjustment for acoustical events with onset rates greater than 15 dBA per second, such as high-speed jets operating near the ground, and is assessed with flying days per month. As a result, Ldnmr is always equal to or greater than DNL and, therefore, a more conservative noise metric.

4.4.1 Proposed Action (Alternative A)

Aircraft Sorties

SUAs that were modeled under the Proposed Action include Grayling West and East MOAs; Steelhead MOA; Steelhead Low East, Low North, and Low South MOAs; Pike East and West MOAs; R-4201A/B; and the MTRs, VR-1601 and VR-1602. Hersey MOA would be returned to the NAS under the Proposed Action. The sortie numbers and hours were obtained from Alpena CRTC, Selfridge ANGB, and Toledo ANGB and represent an average over a year (MIANG & OHANG, 2021). The proposed sortie numbers and hours are based on a conservative annual estimate from average operational data and the planned mission and would be flown after the Proposed Action is implemented.

Table 2-3 summarizes the total existing and proposed sorties in the Alpena SUA Complex; the number of sorties and the time in each SUA are shown in Table 2-4 through Table 2-16. MRNMap was used to calculate noise levels for sorties within the existing and proposed SUAs. As shown in Table 4-2, most of the operational noise levels are at or below 45 dBA Ldnmr. The Grayling West MOA and Pike East MOA show levels of 45 dBA Ldnmr under the Proposed Action; the floors of those MOAs are 500 feet AGL and 300 feet AGL, respectively. The Steelhead Low North and East MOAs also have low floors (500 feet AGL); however, most of the sorties (870 sorties) are conducted with the A-10 aircraft. Generally, the maximum sound levels from the A-10 aircraft are quieter than the maximum sound levels from the F-16 aircraft. In the Pike East MOA, only 40 sorties are conducted annually with the A-10 and 80 sorties are conducted with the F-35 aircraft under the Proposed Action. A large increase in nighttime operations would also occur in the Pike East MOA, from 9 to 111; Ldnmr includes a 10 dBA adjustment added to the nighttime operations. The proposed Grayling West MOA was modeled with approximately 600 more sorties as compared to the Steelhead Low North and East MOAs.

Within R-4201A, the noise level is 62 dBA Ldnmr under existing conditions and 63 dBA Ldnmr under the Proposed Action. Although the total number of sorties within R-4201A would decrease slightly, the number of nighttime sorties would increase from 86 to 121, or approximately 5 percent to 7 percent. As previously noted, Ldnmr includes a 10 dBA adjustment added to the nighttime operations. Within R-4201B, the noise level for existing conditions would be 45 dBA Ldnmr, which increases to 57 dBA Ldnmr under the Proposed Action. The number of sorties within R-4201B would increase from 323 to 1,665; however, the ceiling would also increase from 9,000 feet MSL to 23,000 feet MSL, providing higher altitudes for aircraft to train.

Table 4-2 Existing and Proposed Ldnmr Values within the Alpena SUA Complex

Airspace	Existing Ldnmr	Proposed Ldnmr
Grayling West MOA	<35 dBA	45 dBA
Grayling East MOA	<35 dBA	<35 dBA
Steelhead MOA	35 dBA	40 dBA
Steelhead Low North MOA	35 dBA	40 dBA
Steelhead Low South MOA	35 dBA	40 dBA
Steelhead Low East MOA	35 dBA	40 dBA
Pike West MOA	35 dBA	35 dBA
Pike East MOA	35 dBA	45 dBA
Hersey MOA	<35 dBA	<35 dBA
R-4201A	62 dBA	63 dBA
R-4201B	45 dBA	57 dBA
Grayling Temporary MOA	<35 dBA	45 dBA
VR-1601 and VR-1602	<35 dBA	35 dBA

(MIANG, 2021)
Key: dBA = A-weighted decibels; Ldnmr = Onset-Adjusted Monthly Day-Night Average Sound Level; MOA = Military Operations Area; R = Restricted Area; SUA = Special Use Airspace; VR = Visual Flight Rules Military Training Route.

Similar to Ldnmr, the DNL noise levels, shown in Table 4-3, are mostly at or below 45 dBA DNL. The Grayling West MOA and Pike East MOA show levels of 45 dBA DNL. As discussed in Section 3.4, noise levels in the mid 30 to 40 dBA range, such as those in the Alpena SUA Complex, correspond to rural and very quiet suburban land uses. Therefore, an increase in noise levels from 35 dBA to 40 or 45 dBA is not considered a significant impact and would not have an effect on human populations such as annoyance, speech interference, sleep disturbance, hearing loss, or disruption to children's learning. The 61 dBA DNL noise level within R-4201A would remain the same under the Proposed Action. The 45 dBA DNL noise level within R-4201B would increase to 56 dBA DNL under the Proposed Action. As previously discussed, for air traffic airspace actions, the FAA considers "reportable noise" change-of-exposure at population centers by an increase of 5 dBA from 45 dBA to <60 dBA. Although there is an increase in noise of more than 5 dBA within R-4201B, the land use in this area is mainly undeveloped with a few scattered residences; there are no population centers (i.e., urban center or urban cluster) underneath the restricted area. Given that the noise levels are less than 65 dBA DNL, the noise levels would not be considered significant.

Table 4-3 Existing and Proposed DNL Values within the Alpena SUA Complex Alpena

Airspace	Existing DNL	Proposed DNL
Grayling West MOA	<35 dBA	45 dBA
Grayling East MOA	<35 dBA	<35 dBA
Steelhead MOA	35 dBA	40 dBA
Steelhead Low North MOA	35 dBA	40 dBA
Steelhead Low South MOA	35 dBA	40 dBA
Steelhead Low East MOA	35 dBA	40 dBA
Pike West MOA	35 dBA	35 dBA
Pike East MOA	35 dBA	45 dBA
Hersey MOA	<35 dBA	<35 dBA
R-4201A	61 dBA	61 dBA
R-4201B	44 dBA	56 dBA
Grayling Temporary MOA	<35 dBA	45 dBA
VR-1601 and VR-1602	<35 dBA	<35 dBA

(MIANG, 2021)
Key: dBA = A-weighted decibels; DNL = Day-Night Average Sound Level; MOA = Military Operations Area; R = Restricted Area; SUA = Special Use Airspace; VR = Visual Flight Rules Military Training Route.

Points of interest within the Alpena SUA Complex were chosen to assess noise levels at specific locations based on land uses that are anticipated to be noise sensitive. Noise-sensitive land uses are based on guidelines from DOD Instruction 4165.57 (DOD, 2021) and FAA Part 150, *Airport Noise Compatibility Planning* (14 CFR 150), and include state forests, residences, and cultural sites (see Figure 4-1).

Land Use Compatibility

DOD Instruction 4165.57 and FAA Part 150 provide recommended land use compatibility based on DNL primarily to discourage high noise exposure in noise-sensitive land uses.

Land uses that are **Compatible** below 65 dBA DNL include:

- residential uses
- cultural activities
- parks
- outdoor recreational areas

(DOD, 2021)

Several points are located beneath the proposed Steelhead Low MOAs including Bay Port, Harbor Beach, Huron City, Sanilac Park, Sleeper State Park, and Tawas Lighthouse. As shown in Table 4-4, under the Proposed Action, some of these noise levels would increase by 6 or 7 dBA. However, all of the noise levels are below 40 dBA Ldnmr. As discussed in Section 3.4, noise levels in the mid-30 to -40 dBA range correspond to rural and very quiet suburban land uses and are not considered significant.

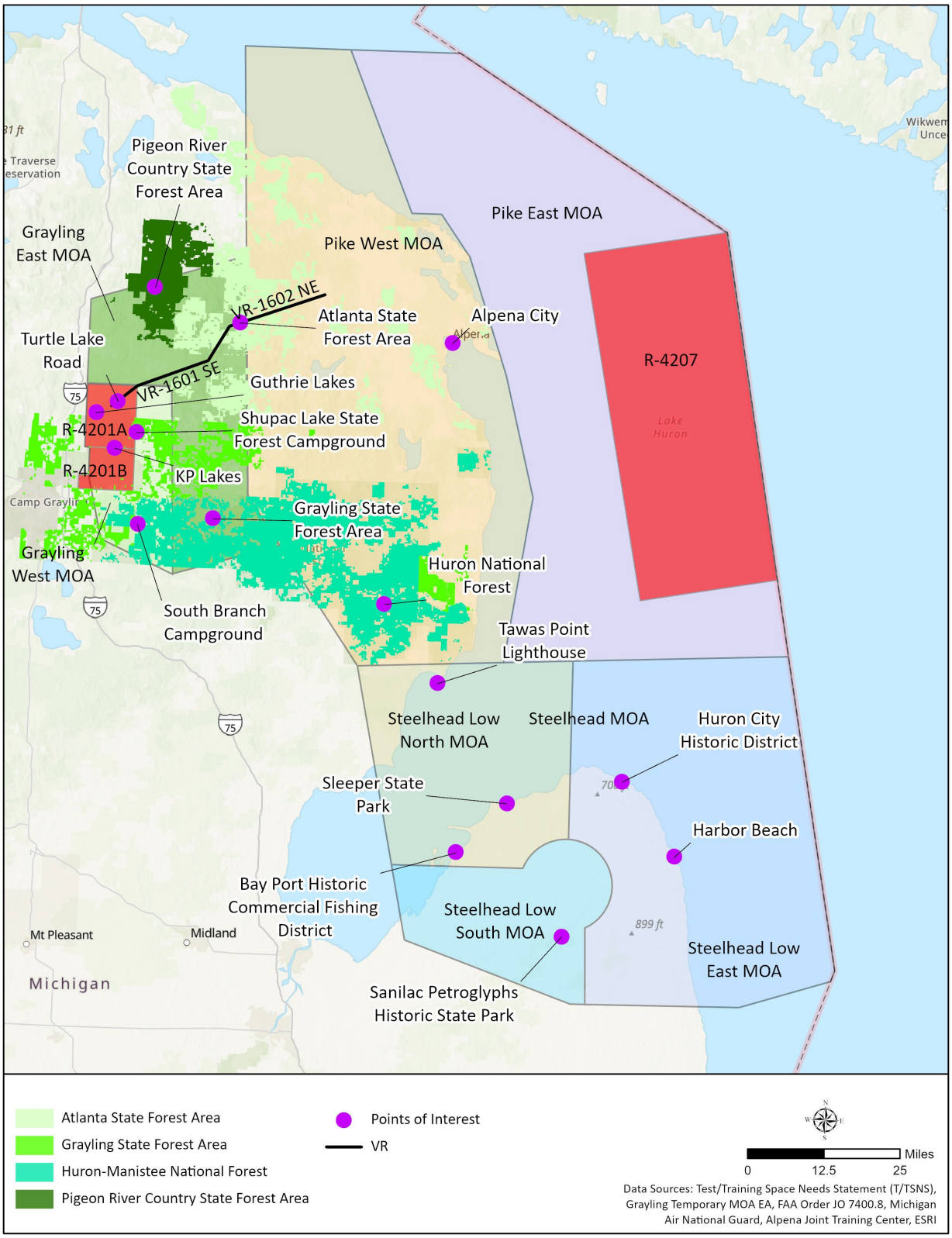
Table 4-4 Ldnmr Values for Points of Interest

Point of Interest (Airspace)	Existing Ldnmr	Change under Proposed Action
Alpena City (Pike West MOA)	36 dBA	2 dBA
Atlanta State Forest (VR-1601/1602; Grayling East MOA)	35 dBA	—
Bay Port Historic Commercial Fishing District (Steelhead Low North MOA)	38 dBA	6 dBA
Grayling State Forest (Grayling East MOA)	35 dBA	—
Guthrie Lakes (R-4201A)	62 dBA	1 dBA
Harbor Beach (Steelhead Low East MOA)	38 dBA	6 dBA
Huron City Historic District (Steelhead Low East MOA)	38 dBA	6 dBA
Huron National Forest (Pike West MOA)	36 dBA	2 dBA
KP Lakes (R-4201A/B)	48 dBA	8 dBA
Pigeon River Country State Forest (Grayling East MOA)	35 dBA	—
Sanilac Petroglyphs Historic State Park (Steelhead Low South MOA)	38 dBA	3 dBA
Shupac Lake State Forest Campground (R-4201A; Grayling West MOA)	62 dBA	1 dBA
Sleeper State Park (Steelhead Low North MOA)	38 dBA	6 dBA
South Branch Campground (Grayling West MOA)	35 dBA	12 dBA
Tawas Point Lighthouse (Steelhead Low North MOA)	37 dBA	7 dBA
Turtle Lake Road (VR-1601/1602; R-4201A)	63 dBA	1 dBA

(MIANG, 2021)

Key: dBA = A-weighted decibels; Ldnmr = Onset-Adjusted Monthly Day-Night Average Sound Level; MOA = Military Operations Area; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

Figure 4-1 Points of Interest within Alpena SUA Complex



Guthrie Lakes is a residential community underneath R-4201A, and KP Lakes is a residential community underneath R-4201B. The Ldnmr level would increase at Guthrie Lakes by 1 dBA but would remain under 65 dBA Ldnmr. The Ldnmr level would increase at KP Lakes by 8 dBA, which would be a result of the increase in sorties under the Proposed Action. However, this increase would be less than the 65 dBA Ldnmr threshold. A condition of the establishment of R-4201A and R-4201B was that the airspace overlie property owned by the military or the U.S. Government (Camp Grayling and Alpena CRTC, 2018). However, small portions of land may be privately owned if a conditional use lease agreement has been established between the landowner and the government. There is property that is not owned by the government within these restricted areas, including the housing community in Guthrie Lakes and KP Lakes. This has allowed for private residences to be built very close to the range and loud military training activities. Currently, there are noise abatement areas around Guthrie Lakes and KP Lakes (1,500 feet horizontal and vertical) restricting flight training activities below 1,500 feet AGL within a 1,500-foot radius of each community.

The South Branch Campground, within the proposed Grayling West MOA, has an existing noise level of 35 dBA Ldnmr, which would increase to 47 dBA Ldnmr under the Proposed Action. The increase in Ldnmr would still be within the typical ambient noise levels for that environment. Shupac Lake State Forest Campground is also located within the proposed Grayling West MOA; however, it is adjacent to R-4201A, which is why the noise level is higher at 62 dBA Ldnmr. Turtle Lake Road, which is 63 dBA Ldnmr, is under the proposed VR-1601 and VR-1602 and within R-4201A. Both points would increase by 1 dBA Ldnmr, which is not a significant increase. As stated in Section 4.4, a significant increase occurs when an action would increase noise by 1.5 dBA DNL/Ldnmr or more for a noise-sensitive area that is already exposed to noise at or above the 65 dBA DNL/Ldnmr noise exposure.

Table 4-5 shows the DNL values for the points of interest. The DNL levels, and the changes under the Proposed Action, are similar to the Ldnmr levels shown in Table 4-4. Guthrie Lakes is 61 dBA DNL under existing conditions, which would not change under the Proposed Action. KP Lakes would increase by 7 dBA, but it would remain under 60 dBA DNL. Other points of interest with larger increases would have noise levels below 60 dBA DNL.

Table 4-5 DNL Values for Points of Interest

Point of Interest (Airspace)	Existing DNL	Change under Proposed Action
Alpena City (Pike West MOA)	36 dBA	2 dBA
Atlanta State Forest (VR-1601/1602; Grayling East MOA)	35 dBA	—
Bay Port Historic Commercial Fishing District (Steelhead Low North MOA)	38 dBA	6 dBA
Grayling State Forest (Grayling East MOA)	35 dBA	—
Guthrie Lakes (R-4201A)	61 dBA	—
Harbor Beach (Steelhead Low East MOA)	38 dBA	6 dBA
Huron City Historic District (Steelhead Low East MOA)	38 dBA	6 dBA
Huron National Forest (Pike West MOA)	36 dBA	2 dBA
KP Lakes (R-4201A/B)	48 dBA	7 dBA
Pigeon River Country State Forest (Grayling East MOA)	35 dBA	—
Sanilac Petroglyphs Historic State Park (Steelhead Low South MOA)	38 dBA	3 dBA
Shupac Lake State Forest Campground (R-4201A; Grayling West MOA)	61 dBA	—
Sleeper State Park (Steelhead Low North MOA)	38 dBA	6 dBA
South Branch Campground (Grayling West MOA)	35 dBA	12 dBA
Tawas Point Lighthouse (Steelhead Low North MOA)	37 dBA	7 dBA
Turtle Lake Road (VR-1601/1602; R-4201A)	61 dBA	—

(MIANG, 2021)

Key: dBA = A-weighted decibels; DNL = Day-Night Average Sound Level; MOA = Military Operations Area; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

Table 4-6 shows the Lmax levels for the points of interest in the Alpena SUA Complex under existing conditions and the Proposed Action. Lmax is the maximum sound level from a single source. It is the highest A-weighted sound level that occurs, for example, during an aircraft overflight or from a piece of construction equipment. While Lmax represents the sound from a single event, DNL and Ldnmr provide a measure of the overall acoustical environment during a period of time but do not directly represent the sound level at any given time. The noise levels for Grayling State Forest and Pigeon Forest would have lower levels under the Proposed Action as compared to existing conditions because the proposed Grayling East MOA covers some of the same area as the existing Grayling Temporary MOA. However, Grayling East MOA would have a floor of 10,000 feet MSL, where the Grayling Temporary MOA was modeled with a floor of 5,000 feet MSL. South Branch Campground would increase from 86 dBA to 110 dBA because it is under the proposed Grayling West MOA, which would have a floor of 500 feet AGL. As previously discussed, Shupac Lake State Forest Campground is under the proposed Grayling West MOA but also adjacent to R-4201A, which is why the level is high.

Table 4-6 Lmax Noise Levels for Points of Interest

Point of Interest (Airspace)	Existing Lmax	Proposed Lmax
Alpena City (Pike West MOA)	86 dBA	86 dBA
Atlanta State Forest (VR-1601/1602; Grayling East MOA)	86 dBA	88 dBA
Bay Port Historic Commercial Fishing District (Steelhead Low North MOA)	86 dBA	115 dBA
Grayling State Forest (Grayling East MOA)	86 dBA	78 dBA
Guthrie Lakes (R-4201A)	128 dBA	128 dBA
Harbor Beach (Steelhead Low East MOA)	86 dBA	115 dBA
Huron City Historic District (Steelhead Low East MOA)	86 dBA	115 dBA
Huron National Forest (Pike West MOA)	86 dBA	86 dBA
KP Lakes (R-4201A/B)	127 dBA	127 dBA
Pigeon River Country State Forest (Grayling East MOA)	85 dBA	77 dBA
Sanilac Petroglyphs Historic State Park (Steelhead Low South MOA)	86 dBA	91 dBA
Shupac Lake State Forest Campground (R-4201A; Grayling West MOA)	128 dBA	128 dBA
Sleeper State Park (Steelhead Low North MOA)	86 dBA	115 dBA
South Branch Campground (Grayling West MOA)	86 dBA	110 dBA
Tawas Point Lighthouse (Steelhead Low North MOA)	86 dBA	115 dBA
Turtle Lake Road (VR-1601/1602; R-4201A)	128 dBA	128 dBA

(MIANG, 2021)

Key: dBA = A-weighted decibels; Lmax = Maximum Sound Level; MOA = military operations area; R = Restricted Area; VR = Visual Flight Rules Military Training Route.

The noise levels for points under the proposed Steelhead Low MOAs, such as Harbor Beach and Sleeper State Park, would increase under the Proposed Action because the existing Steelhead MOA has a floor of 6,000 feet MSL and the proposed Steelhead Low East and North MOAs would have floors of 500 feet AGL. Given the proposed floors of these Steelhead Low MOAs, the following measures would be implemented that would reduce potential impacts:

- In the Steelhead Low MOAs, participating aircraft would be restricted to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline only between May 15 and September 15.
- No F-35 aircraft would be allowed in the Steelhead Low North, South, and East MOAs.

The number of flying days in the Steelhead Low MOAs would be approximately 22 days per month, which is approximately 264 flying days per year. Given that there are 1,020 sorties per year in each Steelhead Low MOA, there would be about 4 sorties per day. The sorties in the Steelhead Low North and South MOAs would only be in those airspaces for approximately 15 minutes. Therefore, it is likely that a very low number of flyover events would occur per hour in one particular area. In the Steelhead Low East MOA, aircraft would spend more time in the airspace, with approximately 22 percent (or 230 sorties per year) for 45 to 60 minutes. However, the Steelhead Low East MOA has more area than the other MOAs, with 2,102 square miles; as a result, there it is likely that a particular area would experience a very low number of aircraft flyover events per hour. Furthermore, populations would only be exposed to these levels outside; a typical dwelling built with standard materials provides 20 to 30 dB of noise-level reduction when the windows and doors are closed, if the structure is in good condition (U.S. Navy, 2005). To model the worst-case scenario, aircraft were modeled without the "seasonal shoreline" measure implemented within one nautical mile of the Lake Huron shoreline. As shown in Table 4-6, the noise level under the Steelhead Low MOAs without the seasonal shoreline measure would be 115 dBA Lmax (Bay Port, Harbor Beach, Huron City, Sleeper State Park, and Tawas Lighthouse). With the seasonal shoreline measure implemented, Lmax would be 102 dBA. As a result, single-event noise levels would be lower during these periods along the shoreline. These measures would reduce the number of instances that populations would be exposed to high single-event noise events.

The Lmax levels for Guthrie Lakes and KP Lakes are high because those points are directly underneath the restricted areas. These levels are high under both the existing and proposed scenarios and do not increase under the Proposed Action. While individual flyover events would be loud at times, these events are infrequent and of short duration. As previously discussed, the FAA significance threshold for noise occurs when the action would increase by 1.5 dBA DNL or Ldnmr or more for a noise-sensitive area that is exposed to noise at or above the 65 dBA DNL/Ldnmr noise exposure level. Impacts would not be significant.

A significant noise impact occurs when the action would increase noise by 1.5 dBA DNL/Ldmnr or more for a noise-sensitive area that is exposed to noise at or above the 65 dBA DNL/Ldmnr. Under the Proposed Action, none of the increases in noise levels would be at or above 65 dBA DNL/Ldmnr. Some of the areas would see increases in noise of 10 dBA from 35 dBA to 45 dBA DNL/Ldmnr. However, noise levels in the mid-30 to 40 dBA range correspond to rural and very quiet suburban land uses and include ambient noise levels in the Alpena SUA Complex. Therefore, an increase in noise levels from 35 dBA to 40 or 45 dBA would not have an adverse effect on human populations such as annoyance, speech interference, sleep disturbance, hearing loss, or disruption to children's learning. Under the Proposed Action, noise impacts would not be significant.

4.4.2 Alternative B: No Steelhead Low MOAs

Alternative B includes the same aspects of the Proposed Action, except that the three Steelhead Low MOAs would not be established. As a result, the noise levels in the area where R-4201A/B, Grayling MOAs, and Pike MOAs would be the same as discussed under the Proposed Action (see Table 4-2 through Table 4-6). The individual noise levels under the Steelhead MOA region for points of interest, as shown in Table 4-6, would remain at the current levels, which is in the 86 dBA Lmax range as compared to the 115 dBA Lmax range under the Proposed Action. Given that the Low

MOAs would not be established under the Proposed Action, the noise levels under the Steelhead MOAs would remain at existing levels (35 dBA Ldnmr and DNL).

Under Alternative B, the sorties would be redistributed in the existing SUA as compared to the Proposed Action. However, because Alternative B does not include the establishment of the three Steelhead Low MOAs (i.e., Steelhead Low North, South, and East MOAs), no sorties would occur within any of the proposed Steelhead Low MOA boundaries. For example, under the Proposed Action, one F-16 sortie for one hour could fly in the following MOAs:

- Pike East: 20 min
- Pike West: 20 min
- Steelhead: 15 min
- Steelhead Low: 5 min

Under Alternative B (with no Steelhead Low MOAs), the same sortie could be redistributed in the existing MOAs as follows:

- Pike East: 20 min
- Pike West: 20 min
- Steelhead: 20 min

As a result, the change in noise levels between the Proposed Action and Alternative B would be minor. In addition, under Alternative B, the Steelhead Low MOAs would not be established; therefore, sorties would need to be conducted at higher altitudes in that airspace complex and the noise levels would be lower as compared to the Proposed Action. Impacts would not be significant.

4.4.3 Alternative C: No Grayling East or West MOAs

Alternative C would include the same aspects of the Proposed Action, except that the Grayling East and Grayling West MOAs would not be established, the Grayling Temporary MOA would continue to be requested to support annual exercises, and the Hersey MOA would remain with the MIANG. The Grayling West MOA would remain under 35 dBA Ldnmr and DNL under Alternative C (compared with 45 dBA Ldnmr and DNL under the Proposed Action). The areas that the Grayling East and Grayling Temporary MOAs overlay would remain under 35 dBA Ldnmr and DNL. The example of sortie distribution that is discussed under Alternative B would also occur under Alternative C. Overall, noise levels under Alternative C would be lower as compared to the Proposed Action. Impacts would not be significant.

4.4.4 Alternative D: No Action Alternative

Noise levels under the No Action Alternative would be the same as described under the existing conditions in Section 3.4. Most of the Ldnmr noise levels in the Alpena SUA are below 35 dBA. The restricted areas have levels that are higher, with R-4201A at 62 dBA Ldnmr and 61 dBA DNL, and R-4201B at 45 dBA Ldnmr and 44 dBA DNL. The Grayling Temporary MOA is one of the SUAs with noise levels below 35 dBA. As a temporary MOA, the establishment of the Grayling Temporary MOA must be requested every year. Training normally occurs for two weeks per year, and the mix of aircraft changes annually. As a result, the number of sorties that are flown in this MOA per year when it is activated remains low (309 sorties), as shown in Table 2-3. Given that the surrounding area is fairly rural, ambient noise levels in this area would be comparable to the Ldnmr and DNL noise levels when the Grayling Temporary MOA is established. Impacts would not be significant.

4.5 Land Use

Determination of land use impacts is based on the degree of land use sensitivity in the area. Effects on land use are evaluated to the extent that a 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.

4.5.1 Proposed Action (Alternative A)

Regional Land Use

Land underneath the Alpena SUA Complex consists of several forest regions, small- to medium-sized municipalities, and rural areas. Most of the region where modifications and new SUAs are proposed already have existing SUA. The implementation of the changes to the SUA under the Proposed Action would not preclude existing land uses on the ground. Furthermore, land use was assessed for noise impacts throughout the region, as discussed in Section 4.4.1 and below, and no significant adverse impacts were found. Based on an overall assessment of land use compatibility, the Proposed Action would not have significant impacts on land use.

Under the Proposed Action, the Atlanta State Forest Area would be underneath the Grayling East MOA and the Pike West MOA. The Grayling State Forest Area would be underneath the Grayling East MOA, Grayling West MOA, Pike West MOA, and R-4201. The Huron-Manistee National Forest would be underneath the Grayling East MOA, Grayling West MOA, and Pike West MOA. The Pigeon River County State Forest would be under the Grayling East MOA. Collectively, the forest areas are underneath the Grayling East MOA, Grayling West MOA, and Pike West MOA with a few acres underneath Pike East MOA and R-4201A/B. The operational noise levels for the Atlanta State Forest, Grayling State Forest, and Pigeon Forest would be lower under the Proposed Action as compared to existing conditions. The existing levels in these areas are 35 dBA DNL/Ldnmr or less and would not increase above 45 dBA under the Proposed Action. Noise levels would decrease from existing conditions in these areas because the proposed Grayling East MOA would have a floor of 10,000 feet MSL, where the Grayling Temporary MOA was modeled with a floor of 5,000 feet MSL. Noise impacts on noise-sensitive receptors or points of interest are discussed in Section 4.4.1.

Land use under the three Steelhead Low MOAs is primarily agricultural with small municipalities scattered throughout the region and recreational areas on the coast. Overall DNL/Ldnmr levels would remain below 45 dBA, which would not adversely affect the existing land uses. Noise impacts on noise-sensitive receptors or points of interest are discussed in Section 4.4.1.

Chaff and Flare

Flight activities within the Alpena SUA Complex currently use chaff and flare during training. Anticipated expenditures could increase by approximately 20 percent under the Proposed Action. Due to the extremely high temperatures at which flares burn upon ignition, the use of flares presents a small risk for fire. Flare-induced fire could adversely affect sensitive land uses such as forest, recreation, agriculture, and residential areas (USAF, 2011). Remote areas with large fuel loads could experience high-intensity and damaging fires. However, the potential for flare-induced fires is reduced through existing operational and administrative procedures such as increasing the minimum flare release altitude or restricting the use of flares during high fire risk weather.

Training activities involving chaff and flare would continue to adhere to existing safety protocols. As discussed in Section 4.2.1, flares across most of the Alpena SUA Complex would be deployed at or above 2,000 feet AGL, presenting a low fire risk from use of flares. Within R-4201, flares may be deployed at 1,000 feet AGL, consistent with existing conditions. If necessary due to seasonal fire conditions, the altitude at which flares are deployed would be raised to 2,000 feet within R-4201 to decrease fire risk.

4.5.2 Alternative B: No Steelhead Low MOAs

Alternative B includes the same aspects of the Proposed Action as described in Section 4.5.1; however, no regional impacts on land use would occur under the Steelhead Low MOAs. Impacts would not be significant.

4.5.3 Alternative C: No Grayling East or West MOAs

Alternative C includes the same aspects of the Proposed Action as described in Section 4.5.1. However, no change in operational noise levels would occur within the proposed Grayling West and East MOAs, so noise levels would be comparable in Atlanta State Forest, Grayling State Forest, and Pigeon Forest as under existing conditions. Impacts would not be significant.

4.5.4 Alternative D: No Action Alternative

Under the No Action Alternative, land use would remain comparable to what is described in Section 3.5. No changes in operational noise levels would occur. Impacts would not be significant.

4.6 Water Resources

The analysis for water resources in this EA considers potential impacts on water quality and coastal resources. Airspace-related activities associated with the Proposed Action and alternatives would not involve construction and would not directly alter any water quantity, flow, percolation, or supply. As discussed in Section 3.6 and Appendix A, Section A.8, no impacts on groundwater resources, wetlands, floodplains, or wild and scenic rivers would occur.

4.6.1 Proposed Action (Alternative A)

Chaff and Flare

The modification and establishment of airspace would not affect water quality. However, as presented in Section 2.1.4 and Table 2-17, a 20 percent increase in chaff and flare use is proposed. The increase in chaff and flare could result in increased dud flares, which deteriorate when in water. The components of flare (magnesium oxide, magnesium chloride, and magnesium fluoride) do not pose an adverse risk to human and environmental health at the concentrations experienced in flare use (USAF, 2011). The proposed increase in chaff bundles and flares would be distributed over a larger land area (an additional 1,633 square nautical miles). It is not anticipated or likely that dud flares would accumulate in the same place in sufficient concentrations to adversely affect water quality. Therefore, the increase in chaff and flare activity is not likely to have any adverse impact on sensitive aquatic systems. Studies have determined chaff released in airspace above aquatic environments on a regular basis has not been found to adversely affect aquatic resources (USAF, 2011). Furthermore, the NGB prepared a comprehensive EA analyzing the effects of chaff and flare on aquatic environments in the Steelhead and Pike MOAs; no significant impacts on water quality were identified (NGB, 2002). While the Proposed Action would increase chaff and flare above

existing levels, the amount of airspace would also increase, and proposed levels of chaff and flare use would remain well below the levels analyzed in the NGB's 2002 EA. Therefore, an increase in chaff activities would not have a significant impact on water resources.

Coastal Resources

Michigan's NREPA is the primary statute for coastal zone management. The Proposed Action would comply to the maximum extent practicable with Michigan's coastal zone policies and would not adversely affect sensitive coastal land uses or resources. A negative determination will be sent to EGLE pursuant to Section 307 of the Coastal Zone Management Act. See Appendix C for coastal zone correspondence.

4.6.2 Alternative B: No Steelhead Low MOAs

The potential impacts on water resources under Alternative B would be similar to those described for the Proposed Action in Section 4.6.1. Use of chaff and flare under Alternative B would increase by approximately 10 percent over existing conditions, which is half as much as described under the Proposed Action. This projected increase of chaff and flare would be distributed over the same land area as analyzed under the Proposed Action, which includes the Steelhead MOA. Impacts would not be significant.

4.6.3 Alternative C: No Grayling East or West MOAs

The potential impacts on water resources under Alternative C would be similar to those described for the Proposed Action in Section 4.6.1. Use of chaff and flare under Alternative C would increase by approximately 10 percent over existing conditions, which is half as much as described under the Proposed Action. Chaff and flare would be distributed over a smaller land area than the Proposed Action but at quantities still much lower than those analyzed in the NGB's 2002 EA. Impacts would not be significant.

4.6.4 Alternative D: No Action Alternative

Under the No Action Alternative, water resources would remain the same as those described in Section 3.6. No ground-disturbing activities would occur with continued use of the Alpena SUA Complex in their current configuration. Impacts would not be significant.

4.7 Biological Resources

The impacts on biological resources would be adverse if a species or habitats of high concern are adversely affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern. As a requirement under the Endangered Species Act, federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The Endangered Species Act requires that all federal agencies avoid "taking" federally threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the Endangered Species Act establishes a consultation process for agency actions that may or will affect threatened or endangered species and their habitat that ends with USFWS concurrence or a determination of the risk of jeopardy from a federal agency project.

4.7.1 Proposed Action (Alternative A)

Wildlife

The areas where lower floors are proposed were carried through for further analysis of potential impacts to wildlife. This includes the Grayling West MOA (500 feet AGL floor), Steelhead Low North MOA (500 feet AGL floor), Steelhead Low South MOA (4,000 feet MSL floor), Steelhead Low East MOA (500 feet AGL floor), and the proposed MTRs (300 feet AGL floor). However, airspace changes would not be expected to affect terrestrial wildlife since studies suggest that species under the existing airspace are already habituated to aircraft activity without statistically significant differences in behavior and activity levels between preflight and postflight aircraft overflight occurrences (Trimper, et al., 1998; LeRoux & Waas, 2012). Based on continued reproductive success of the wildlife within the airspace, newborn individuals would be expected to acclimate to aircraft activity with no long-term effects.

The Kirtland's Warbler Wildlife Management Area is located throughout the northern part of the Lower Peninsula of Michigan in Presque Isle, Montmorency, Oscoda, Ogemaw, Crawford, Kalkaska, Roscommon, and Clare Counties. The management area properties are located adjacent to state of Michigan lands. Kirtland's warbler was removed from protections under the Endangered Species Act in 2019 but remains a state-listed endangered bird species. The Wildlife Management Area consists of 125 separate parcels of land that provide jack pine forest habitat. The proposed airspace changes are expected to result in some changes in noise levels that include this management area. Noise impacts are analyzed in detail Section 4.4.1, but changes in the airspace under Alternative A would not result in significant noise impacts. Noise levels for Grayling State Forest and Pigeon Forest would be lower under Alternative A as compared to existing conditions. Some areas under the proposed airspace, such as the Grayling West MOA (which is adjacent to the restricted areas) would see an increase in Lmax (single event) noise levels; levels within the restricted areas would remain the same. Overall, increases in Lmax within the range of the Kirtland's Warbler Wildlife Management Area would occur in areas that are within or adjacent to the existing restricted areas that currently have high Lmax levels. As a result, the warbler should be accustomed to higher levels in those areas. Therefore, the estimated increase in noise levels under the Proposed Action would not have a significant effect on the Kirtland's Warbler Wildlife Management Area sites.

Migratory Birds

Though variation exists among species, most birds fly below 500 feet AGL, except during migratory flights, with the most common migratory altitude being between 500 and 1,000 feet AGL (Ehrlich et al., 1988). Approximately 95 percent of bird migration flights occur below 10,000 feet AGL, with the majority below 3,000 feet AGL (Lincoln et al., 1998). Proposed airspace changes are in the Mississippi Flyway; therefore, the greatest potential for bird strikes under existing and proposed conditions would occur during the spring and fall migrations when birds are typically flying at higher altitudes.

Measures that would reduce impacts on migratory birds, including bald eagles, have been proposed for the Steelhead Low East, South, and North MOAs, where no F-35 aircraft would be permitted to use the airspace, and participating aircraft would be restricted to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline seasonally between May 15 and September 15, which is when shorebirds are most likely to use the lake for forage habitat.

The MIANG has established a BASH Plan, originally adopted in August 2013, and updated in 2020, that includes measures to help minimize the potential for bird strikes, such as a bird hazard warning system and active and passive bird dispersal techniques (MIANG, 2020a). Serving as an adaptive management tool, the BASH Plan for Alpena CRTC prescribes specific actions used to minimize impacts on birds including establishing a Bird Hazard Working Group, establishing aircraft operating procedures to avoid high-hazard situations (including migratory seasons), and providing guidelines for dispersing birds when they are present around the airfield. Changes to the airspace because of the Proposed Action would be subject to the existing BASH Plan, and there would be only a minor increase in sorties (approximately four sorties per day in each Steelhead Low MOA), including maneuvers occurring at altitudes utilizing a 500-foot AGL floor. While an increase in sorties creates a potential for additional bird strikes, the countermeasures established in the BASH Plan aid in the circumvention of these proposed increases; therefore, impacts on migratory birds would not be significant under the Proposed Action.

Bald Eagles

Figure 4-2 depicts the locations of known bald eagle nests within the proposed MOAs in northeastern Michigan. The nest sites are typically associated with large lakes, ponds, and streams that support the bald eagle's fish-heavy diet.

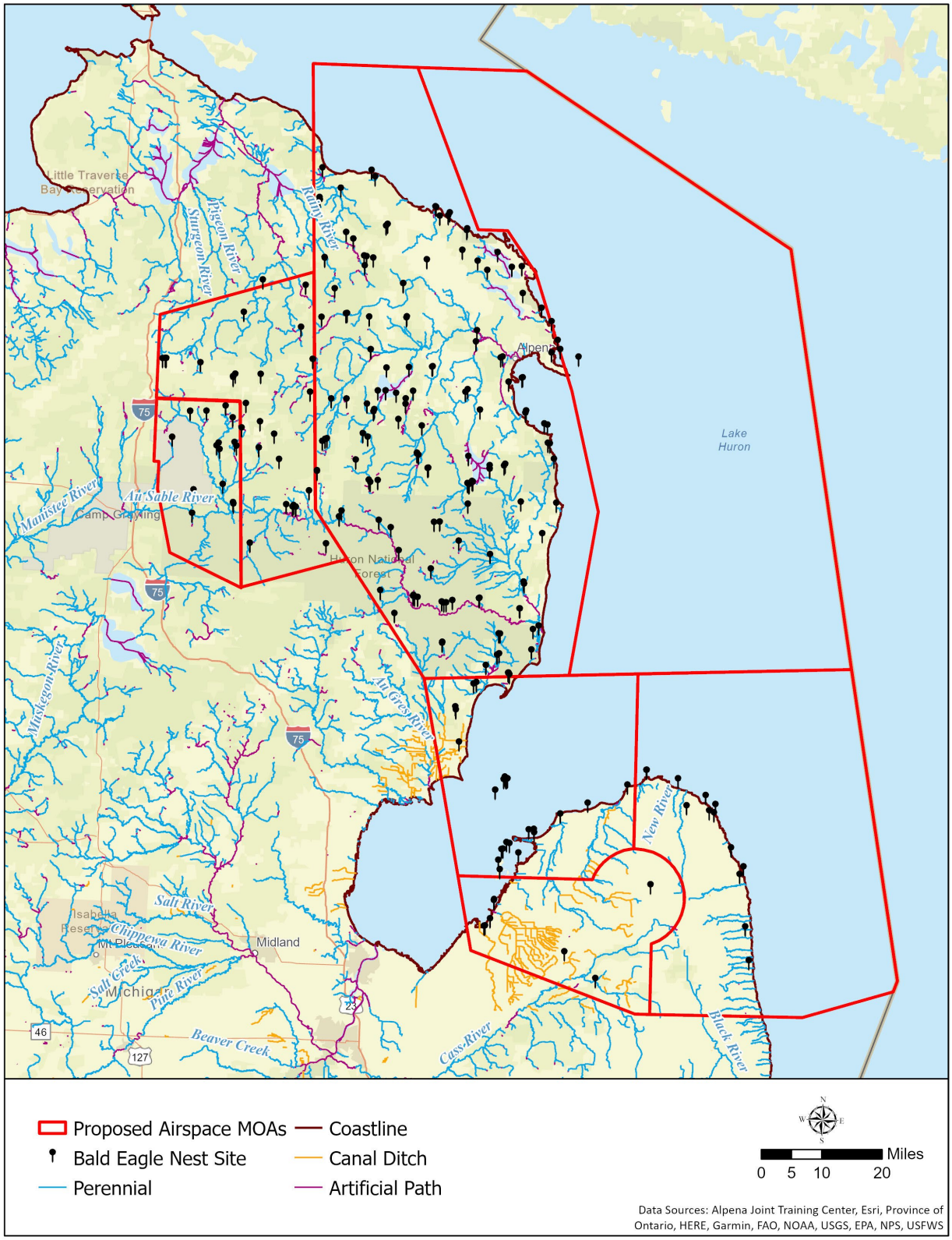
The National Bald Eagle Management Guidelines outlines the following guidelines for activities that have the potential to affect bald eagles (USFWS, 2007):

- Avoid operating aircraft within 1,000 feet of bald eagle nests during the breeding season (December through August), except where eagles have demonstrated tolerance for such activity.
- Avoid use of the secondary crossing runway at Alpena County Regional Airport, especially during the breeding season from December through August.
- Maintain 1,000 feet of vertical and horizontal distance from known foraging and communal roost sites.

As a part of the monitoring program, a survey flight is flown by USFWS in February/March to look for adults on nests that could potentially be incubating eggs. Subsequent flights are made to verify the presence of young in the nest. Future surveys would include the proposed Grayling West MOA, Steelhead Low North MOA, Steelhead Low East MOA, and VR-1601/1602 since the floors would be below 1,000 feet AGL. Bald eagle nest maps will be updated, including mitigation measures, as needed, based on results of annual surveys. This information would be published in the special operations procedures for the proposed VRs that identify the exact location of bald eagle nests and the time of year and vertical and horizontal distances to avoid them. As originally outlined in the Bald Eagle Management Plan for Alpena CRTC (NGB, 2009) that will become part of the Alpena CRTC Integrated Natural Resources Management Plan, the National Bald Eagle Management Guidelines for activities other than aircraft operations around eagle nests would continue to be followed.

With the implementation of the above existing guidelines already in use, impacts on bald eagles would not be significant.

Figure 4-2 Bald Eagle Nests within Alpena Special Use Airspace Complex



Chaff and Flare

A study on the environmental effects of air defense countermeasures concluded that chaff and flare activities were not shown to have an adverse effect on wildlife in areas they were performed (USAF, 2011). Toxicology studies on flare residual materials showed no chemical effects on biological resources, including wildlife. The amount of magnesium dispersed from flares was too small to result in toxicity, and the concentration of flare ash residue at any location is undetectable under normal circumstances due to the dispersal produced by burning in the airspace. As such, there would be no adverse effects on wildlife from chaff and flare deployment.

Threatened or Endangered Species

Appendix D contains the Official Species List and Michigan Determination Key ("Dkey") from the USFWS's online IPaC tool, accessed on July 5, 2022. Table 4-7 summarizes determinations by federal species. The airspace changes outlined for the Proposed Action would have no effect or be not likely to adversely affect federal- or state-listed threatened or endangered species or critical habitat. The USFWS provided concurrence on September 2, 2022, which is also in Appendix D.

Table 4-7 Summary of Federal Species and Critical Habitat and Effects Determinations

Listed Species or Critical Habitat	Status	Determination[1]	Rationale of Proposed Action Effects
Dwarf Lake Iris (*Iris lacustris*)	T	Not likely to adversely affect	No ground disturbance would occur. No alteration of species habitat or resources or direct harm to individual plants would occur from airspace changes.
Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)	T	Not likely to adversely affect	No ground disturbance would occur. No alteration of species habitat or resources or direct harm to individual plants would occur from airspace changes.
Houghton's Goldenrod (*Solidago houghtonii*)	T	No effect	No ground disturbance would occur. No alteration of species habitat or resources or direct harm to individual plants would occur from airspace changes.
Michigan Monkey-flower (*Mimulus michiganensis*)	E	No effect	No ground disturbance would occur. No alteration of species habitat or resources or direct harm to individual plants would occur from airspace changes.
Pitcher's Thistle (*Cirsium pitcheri*)	T	No effect	No ground disturbance would occur. No alteration of species habitat or resources or direct harm to individual plants would occur from airspace changes.
Hine's Emerald Dragonfly (*Somatochlora hineana*)	E	Not likely to adversely affect	No ground disturbance would occur. No impacts on or near wetland habitat would occur. Terrestrial species are habituated or would habituate to aircraft activity.
Hungerford's Crawling Water Beetle (*Brychius hungerfordi*)	E	No effect	No ground disturbance would occur. No impacts on or near streams or rivers would occur.
Karner Blue Butterfly (*Lycaeides melissa samuelis*)	E	No effect	No ground disturbance would occur. No impacts on oak savannah or woodland habitats would occur. Terrestrial species are habituated or would habituate to aircraft activity.

Listed Species or Critical Habitat	Status	Determination[1]	Rationale of Proposed Action Effects
Monarch Butterfly (*Danaus plexippus*)	C	No effect	No ground disturbance would occur. No impacts on pollinator habitat would occur. Terrestrial species are habituated or would habituate to aircraft activity.
Northern Riffleshell (*Epioblasma rangiana*)	E	No effect	No ground disturbance would occur. No impacts on or near streams or rivers would occur.
Eastern Massasauga (*Sistrurus catenatus*)	T	Not likely to adversely affect	No ground disturbance would occur. No impacts on or near wetland habitat would occur. Terrestrial species are habituated or would habituate to aircraft activity. The Dkey identifies conservation measures for this species pertaining to use of erosion control, educational videos, wetland and upland habitat conservation, roadway vehicles, and revegetation of disturbed areas; however, these do not apply to the Proposed Action because there would be no ground disturbance.
Indiana Bat (*Myotis sodalis*)	E	No effect	No ground disturbance would occur. No removal of trees; modification of existing bridges, culverts, or hibernacula; or alteration of wetland or riparian habitat would occur. Nighttime sorties would be infrequent and distributed over a large geographic area.
Northern Long-eared Bat (*Myotis septentrionalis*)	T	Not likely to adversely affect [1]	No ground disturbance would occur. No removal of trees; modification of existing bridges, culverts, or hibernacula; or alteration of wetland or riparian habitat would occur. Nighttime sorties would be infrequent and distributed over a large geographic area. Project actions would not occur within 0.25 mile (1,320 feet) of a known hibernaculum or 150 feet of a known maternity roost tree. The Proposed Action may affect but is not anticipated to cause prohibited take and is therefore not likely to adversely affect the northern long-eared bat. USFWS concurred with this determination on September 2, 2022.
Piping Plover (*Charadrius melodus*)	E	Not likely to adversely affect	No ground disturbance would occur. No modification of shoreline or dune resources would occur. Seasonal avoidance within 1,000 feet of the Lake Huron shoreline between May 15 and September 15 would further minimize impacts on the fall migration season (August 15–September 15).

Listed Species or Critical Habitat	Status	Determination[1]	Rationale of Proposed Action Effects
Red Knot (*Calidris canutus rufa*)	T	Not likely to adversely affect	No ground disturbance would occur. No modification of shoreline or dune resources would occur. Seasonal avoidance within 1,000 feet of the Lake Huron shoreline between May 15 and September 15 would further minimize impacts on the spring (May 15–June 15) and fall (July 1–September 30) migration seasons.
Critical Habitat: Hine's Emerald Dragonfly	Final	Not likely to adversely affect	Critical habitat is in Presque Isle and Alpena Counties beneath the existing Pike West MOA, which has a floor of 6,000 feet MSL. No ground disturbance or alteration of wetland impacts would occur.
Critical Habitat: Piping Plover	Final	Not likely to adversely affect [2]	Critical habitat is in Presque Isle County beneath the existing Pike West MOA, which has a floor of 6,000 feet MSL, and in Iosco County beneath the proposed Steelhead Low North MOA, which has a proposed floor of 500 feet AGL. No ground disturbance or alteration of shoreline or dune resources would occur.

Notes:
[1] The IPaC Dkey determined "may affect" for northern long-eared bat. NGB initiated informal consultation with USFWS, and USFWS concurred with a determination of "not likely to adversely affect" for this species. See Appendix D.
[2] The IPaC Dkey determined "no effect" on piping plover critical habitat; this determination was revised to "not likely to adversely affect" consistent with the determination for piping plover.
Key: AGL = above ground level; C = candidate species; Dkey = Michigan Determination Key; E = endangered; IPaC = Information for Planning and Consultation; MOA = Military Operations Area; MSL = mean sea level; NGB = National Guard Bureau; T=threatened; USFWS = U.S. Fish and Wildlife Service.

The Proposed Action does not involve any ground-based activity or construction, so it would not impact federal- or state-listed threatened or endangered terrestrial animals, insects, aquatic species, or plants. Potential impacts on threatened or endangered species could be associated with aircraft operations in the project area. Terrestrial species under the existing airspace are already habituated to aircraft activity and would experience no significant impacts from changes in aircraft operations.

An initial determination of "may affect" was generated for the northern long-eared bat (federal-listed species) due to the presence of a known hibernaculum beneath the Pike West MOA airspace in Alpena County. The floor of the Pike West MOA airspace utilized over the Alpena hibernaculum is 6,000 feet MSL, with vertical airspace usage of the Pike West MOA ranging from 6,000–17,999 feet MSL. Under the Proposed Action, the southern border of this airspace would be straightened, aligned with the ATCAA boundaries above, and shifted slightly north in accordance with the Steelhead MOA. No new SUA would be created laterally or vertically in Pike West MOA; only internal lateral boundaries would change. Utilization within Pike West MOA would increase under the Proposed Action by approximately 32 percent; however, with a floor of 6,000 feet MSL, this increase would be above the altitude at which the northern long-eared bat would normally be found based on their habitat preferences and foraging habits (Faure et al., 1993). Project actions would not occur within 0.25 mile (1,320 feet) of a known northern long-eared bat hibernaculum or

150 feet of a known maternity roost tree. The Proposed Action may affect but is not anticipated to cause prohibited take and is therefore not likely to adversely affect the northern long-eared bat. The USFWS concurred with this determination on September 2, 2022. See Appendix D.

Another federal-listed bat species—Indiana bat—may be found within the study area according to the IPaC. Like the northern long-eared bat, the Indiana bat is nocturnal, forages near water bodies, and roosts in trees, when not in hibernation. Most sorties in the low MOAs are proposed to occur during daytime hours when bats are not active, though some nighttime sorties are proposed (approximately 85 sorties per year in the Grayling West MOA and 63 sorties per year in the Steelhead Low MOAs, averaging fewer than two sorties per week at night, although there could be a surge in aircraft sorties during peak training periods and fewer sorties at other times). With the infrequency of nighttime sorties and the square acreage of the MOAs available for flying, there is a low probability that a particular area would experience a large number of aircraft flyover events on a regular basis. Furthermore, the Michigan Natural Features Inventory does not note any occurrences of the Indiana bat in the Alpena SUA or surrounding counties, making it very unlikely to be present (Michigan State University, 2022a). No effect on the Indiana bat is expected.

According to the USFWs IPaC database, two federal-listed birds may also be found within the study area. Piping plover (endangered) and red knot (threatened) are migratory shorebirds that occupy coastal habitat along the Great Lakes. Piping plover critical habitat is also mapped in various locations along the lakeshore. The body of research is not definitive as to the specific effects that low-altitude overflights may have on these two species but suggests that aircraft noise and intrusion would not be likely to adversely affect these species or critical habitat. Black et al. (1984) determined that low-altitude military training flights had no effect on the reproductive success of the great egret (*Ardea alba*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), or little blue heron (*Egretta caerulea*). Burger (1986) found that shorebirds did not flush in response to aircraft overflights but did flush in response to localized intrusions such as people or dogs on the beach. Hillman et al. (2015) studied multiple human disturbances on nesting behaviors of the least tern (*Sternula antillarum*), common tern (*Sterna hirunda*), gull-billed tern (*Gelochelidon nilotica*), and black skimmer (*Rynchops niger*), and found no evidence that military or civilian aircraft adversely affected incubation behavior for these species. DeRose-Wilson et al. (2015) determined that Wilson's plovers (*Charadrius wilsonia*) were more alert and scanned more during military rotorcraft overflights and also scanned more during military and civilian fixed-wing overflights, but heart rates and incubation rates did not change during any overflights, suggesting that there was not a direct link between increased vigilance and decreased reproductive success for this species.

Under the Proposed Action, the floor of the Pike East and Pike West MOAs would not be lowered from the existing airspace floor. With the proposed increase in the number of sorties in the Pike East and West MOAs, minor noise impacts would be expected, as discussed in Section 4.4.1. The noise levels anticipated under this alternative correspond to rural and very quiet suburban land uses, similar to the ambient noise levels in the Alpena SUA Complex. Bird species would be expected to be habituated to the existing aircraft activity and associated noise, and there would be no effect from the modifications to the Pike East and West MOAs.

The proposed Steelhead Low East and North MOAs, also above the Great Lakes shoreline, would have lower floors (i.e., from 6,000 feet MSL under the existing Steelhead MOA to 500 feet AGL under the proposed Steelhead Low East and North MOAs). The Lmax noise levels in the Steelhead Low MOAs would increase under the Proposed Action. However, given that there are 1,020 sorties per year in each Steelhead Low MOA, there would be an average of four sorties per day (assuming 264 flying days per year). The sorties in the Steelhead Low North and South MOAs would be in the airspace for approximately 15 minutes. Therefore, it is unlikely that there would be a large number of flyover events in one particular area. In the Steelhead Low East MOA, aircraft would spend more time, with approximately 22 percent (or approximately 230 sorties per year) spending 45 to 60 minutes in the airspace. However, the Steelhead Low East MOA covers more land area than the other MOAs, with 2,102 square miles; as a result, there is a low probability that a particular area would experience a large number of aircraft flyover events on a regular basis. Shorebirds are most likely to use the lake for foraging habitat. In addition, measures to restrict participating aircraft to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline seasonally only between May 15 and September 15 would further reduce the potential for minor disturbances from the Proposed Action. Overall, the Proposed Action would not be likely to adversely affect the piping plover, red knot, or piping plover critical habitat.

The impact on state-listed bird species (which are listed in Table A-9 in Appendix A, Section A.9) would be minor. As described under *Migratory Birds* above, most birds fly below 500 feet AGL, except during migratory flights, with the most common migratory altitude being between 500 and 1,000 feet AGL (Ehrlich et al., 1988). Bird populations in the region are habituated to the existing Alpena airspace. Measures to reduce impacts from the Proposed Action on migratory birds, including bald eagles, have been incorporated into the design for the Steelhead Low East, South, and North MOAs, as previously discussed. Furthermore, changes to the airspace under the Proposed Action would be subject to the MIANG BASH Plan, which includes measures to help minimize the potential for bird strikes, such as a bird hazard warning system and active and passive bird dispersal techniques (MIANG, 2020a). Approximately four sorties per day would occur in each Steelhead Low MOA. This minor increase in sorties, including maneuvers occurring at altitudes utilizing a 500-foot AGL floor, could create a potential for additional bird strikes. The countermeasures established in the BASH Plan would aid in the circumvention of these proposed increases. Overall, impacts on state-listed birds would not be significant under the Proposed Action.

4.7.2 Alternative B: No Steelhead Low MOAs

The potential impacts to biological resources under Alternative B would be the same as those described for the Proposed Action in Section 4.7.1. Impacts would not be significant.

4.7.3 Alternative C: No Grayling East or West MOAs

The potential impacts to biological resources under Alternative C would be the same as those described for the Proposed Action in Section 4.7.1. Impacts would not be significant.

4.7.4 Alternative D: No Action Alternative

Under the No Action Alternative, potential impacts to biological resources would remain unchanged. No ground-disturbing activities would occur with continued use of the Alpena SUA Complex in their current configuration. Impacts would not be significant.

4.8 Cultural Resources

Analysis of potential effects on cultural resources considers both direct and indirect effects. Direct effects may be the result of physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the importance of the resource; introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting); or neglecting the resource to the extent that it deteriorates or is destroyed. For this analysis, changes in noise levels were considered. Noise levels can physically affect a structure through noise-related vibration, or alter the 'feel' of significant historic properties. The feel of an historic property is the expression of the aesthetic or historic sense of a particular period; it results from the presence of physical features, such as ambient noise, that convey the property's historic character.

4.8.1 Proposed Action (Alternative A)

Proposed airspace modifications and changes in aircraft operations could increase operational noise and alter the feel of historic properties that are present, but these would not be significant. Although there may be adverse effects to historic properties, implementation of Alternative A would not have significant effects on historic properties.

Airspace

No ground disturbance would occur associated with the proposed airspace changes, so no archaeological sites would be affected.

Grayling East/West MOAs

Sorties within the Grayling West MOA could be flown at 500 feet AGL, which is lower than the floor of the Grayling Temporary MOA (which is typically around 5,000 feet MSL). The operational noise level would be 45 dBA Ldnmr and DNL, as discussed in Section 4.4.1. Historic properties are located below this proposed MOA. Noise impacts under the Grayling East and West MOAs would be minimal and would not represent an increase over existing conditions sufficient to cause adverse effects to the feel of cultural resources. Section 4.4.1 provides the noise data for each MOA. Most of the operational noise levels are at or below 45 dBA Ldnmr and DNL, which is within the range of the existing ambient noise level and would not be intrusive to the feel of an historic resource. As a comparison, 40 dBA is in the noise range of a suburban area at night, and 55 dBA is comparable to a household refrigerator (Yale Environmental Health and Safety, n.d.).

Prior analyses on the effects of noise-generated vibrations due to aircraft flyovers conclude that damage from noise depends on the sound pressure levels and the building components. In general, damage is only possible for sounds lasting longer than one second at greater than an unweighted sound level of 130 dB (Committee on Hearing, Bioacoustics, and Biomechanics, 1977). Even low-altitude flyovers of heavy aircraft do not reach the potential for damage (Sutherland et al., 1990). Vibrations to historic structures under the Grayling West and East MOA would not be a concern as the Lmax values at various points of interest under the Grayling East and West MOAs would be lower than noise levels at which vibrations could damage structures (i.e., 130 dB; see also Lmax values in Table 4-6). No ground disturbance would occur, so no archaeological sites would be affected. Therefore, there would be no adverse effects on historic properties from the establishment of Grayling East and West MOAs of the Proposed Action.

Pike East/West MOAs

Historic properties are underneath the Pike East and West MOAs. One such area is the Thunder Bay National Marine Sanctuary. However, under the Proposed Action, only lateral boundaries would be realigned, there would be no changes to the floor or ceiling of the MOAs. Noise levels would increase within Pike East MOA (from 35 dBA to 45 dBA, Ldnmr and DNL), but this would not be intrusive to the feel of historic resources that are present. There would be no change in noise levels within Pike West MOA. In addition, there would be no ground disturbance under either MOA. Therefore, there would be no adverse effects on historic properties under Pike East and West MOAs as a result of the proposed airspace changes.

Steelhead MOA and Steelhead Low North/South/East MOAs

Historic properties are underneath these proposed MOAs. Three new MOAs—Steelhead Low North, South, and East—would be established for low-altitude training, and there would be modifications to the lateral boundaries of the Steelhead MOA. Portions of the flights within Steelhead Low North and Steelhead Low East would be at 500 feet AGL, except from May 15 through September 15, when flights would only be restricted to fly no lower than 1,500 feet AGL within one nautical mile of Lake Huron. Areas underneath the Steelhead Low MOAs would be exposed to higher single-event noise levels. However, given that there would be about four sorties per day in each Steelhead Low MOA, the average noise level would be approximately 40 dBA Ldnmr and DNL (as discussed in Section 4.4.1). Noise impacts under the Steelhead Low North/South/East MOAs would be minimal and would not represent an increase over existing conditions sufficient to cause adverse effects to cultural resources. Similar to the discussion in the Grayling East/West MOAs section above, the average noise level would be low, and single-event noise levels would be short term, so there would be no adverse effects regarding the historic feel of historic properties from increased noise levels (see Ldnmr and DNL levels in Table 4-4 and Table 4-5, respectively) and their structural integrity due to noise-generated vibrations (see Lmax levels in Table 4-6). Therefore, there would be no adverse effects on historic properties under the Steelhead and three Steelhead Low MOAs.

R-4201A/R-4201B

Under the Proposed Action, the ceiling of R-4201B would be raised to 23,000 feet MSL and there would be no ground disturbance. For R-4201A, the noise level would increase by 1 dBA, from 62 dBA to 63 dBA Ldnmr (and remain unchanged using the DNL metric at 61 dBA), and the noise level would increase from 45 dBA to 57 dBA Ldnmr (and 44 dBA to 56 dBA DNL) in R-4201B. Noise levels are assessed for an increase of 1.5 dBA at 65 dBA and higher. Under either metric, ambient noise levels would be below 65 dBA. Therefore, there would be no adverse effects on historic properties under R-4201A/B. Existing single-event noise levels would not increase under the Proposed Action and would remain below 130 dBA; therefore, no effects on historic properties would occur from vibration.

VR-1601/VR-1602

There are historic properties within the VR locations. Refer to the explanation of noise levels for adverse effects under the Grayling East/West MOAs analysis. The noise levels would be low (approximately 35 dBA Ldnmr and DNL), so there would be no adverse effects on cultural resources. Section 4.4.1 provides the noise data for VR-1601/1602.

National Historic Preservation Act Section 106 Consultation

The MIANG and NGB consulted with the Michigan SHPO and 16 federally recognized tribes potentially interested in these locations. The tribes are listed in Table 4-8. During scoping, the Nottawaseppi Huron Band of the Potawatomi indicated that no cultural or religious concerns of the tribe are within the project area, and, therefore, the tribe has no objections to this project (June 24, 2021; see Appendix B). To date, no other tribes have provided comments on the project. Appendix E contains Section 106 consultation with the SHPO and tribes.

Table 4-8 Section 106 Consultation, Federally Recognized Tribes

Tribe Name
Bay Mills Indian Chippewa Community
Grand Traverse Band of Ottawa and Chippewa Indians
Hannahville Potawatomi Indian Community
Huron Potawatomi-Nottawaseppi Huron Band of Potawatomi
Keweenaw Bay Indian Community
Little River Band of Ottawa Indians
Little Traverse Bay Band of Odawa Indians
Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
Pokagon Band of Potawatomi Indians
Lac Vieux Desert Band of Lake Superior Chippewa Indians
Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin
Miami Tribe of Oklahoma
Menominee Indian Tribe of Wisconsin
Red Lake Band of Chippewa Indians, Minnesota
Saginaw Chippewa Indian Tribe of Michigan
Sault St. Marie Tribe of Chippewa Indians

4.8.2 Alternative B: No Steelhead Low MOAs

There would be no adverse effects to historic properties as described in Section 4.8.1. Effects would be similar, except the three Steelhead Low MOAs would not be established. Therefore, implementation of Alternative B would not result in significant effects on historic properties.

4.8.3 Alternative C: No Grayling East or West MOAs

There would be no adverse effects to historic properties as described in Section 4.8.1. Effects would be similar, except the Grayling East and West MOAs would not be established. Therefore, implementation of Alternative C would not result in significant effects on historic properties.

4.8.4 Alternative D: No Action Alternative

There would be no effect on historic properties under the No Action Alternative. There would be no changes in airspace or aircraft operations. Conditions would be as described in Section 3.8. Implementation of Alternative D would not result in significant effects on historic properties.

4.9 Socioeconomics and Environmental Justice

Impacts on the socioeconomic environment of a region would be considered significant if the action were to affect the population and economic activity to the extent that there are substantial shifts in population trends, housing availability, regional spending or earning patterns, or local traffic patterns that would substantially reduce the levels of service on roads within local communities.

If there are potentially significant impacts on any environmental resource areas, the potential for disproportionately high and adverse effects on minority or low-income populations must be examined. If impacts on the physical or natural environment affects a minority or low-income population in a way that is unique and significant to that populations, the effects on that population

must also be examined. Similarly, environmental health and safety risks that may disproportionately affect children must also be examined and determined.

Refer to Section A.13 of Appendix A for further information on Executive Orders 12898 and 13045 as well as detailed tables on population and housing characteristics and economic and employment characteristics in the socioeconomic study area.

4.9.1 Proposed Action (Alternative A)

Negligible-to-minor impacts on the socioeconomics of the region are anticipated, with no disproportionate impacts on minority or low-income populations.

Under the Proposed Action, there would not be any change in employment at Alpena CRTC, and as no construction is associated with Alternative A, there would not be any local expenditures for construction labor, materials, or supplies. Therefore, there would be no direct effects on local or regional sales volume, employment, income, or population under the Proposed Action. The Proposed Action would not change population levels, housing availability, or economics within the region associated with the establishment and change of the Alpena SUA.

Thirteen counties in Michigan would be located under proposed MOAs and VRs with altitude floors lower than 1,000 feet, and populations may experience noise associated with aircraft flying within the low altitude airspace. These counties include Otsego, Montmorency, Oscoda, Crawford, Roscommon, Ogemaw, Alpena, Iosco, Arenac, Huron, Sanilac, Presque Isle, and Alcona Counties. However, the Ldnmr and DNL noise levels in all of the proposed MOAs would be well below significant levels. In addition, the proposed Steelhead Low East MOA would include a seasonal buffer, which would exclude military aircraft from flying lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline only between May 15 and September 15. This would reduce impacts to the populations during peak recreation times. Furthermore, as described in Section 4.4.1, while individual flyover events would be loud at times, these events are infrequent and of short duration. Impacts to the socioeconomics and quality of life within the affected counties would not be significant.

Numerous general aviation airports are within the study area and adjacent to the proposed Alpena SUA Complex. Considerable planning has occurred to anticipate needs, identify potential problems, and develop workable solutions for issues associated with the use of these airspace and associated requirements. Such planning, continuing after implementation of the Proposed Action, would minimize impacts associated with the use of airspace and airspace management in the region, including potential economic impact of the proposed changes to the airspace. See Section 4.1.1, Airspace Management, for further discussion on the anticipated impacts to the specific airports and civilian aviators within and adjacent to the proposed Alpena SUA Complex.

Hazards associated with flare-induced wildfires could indirectly have adverse effects on socioeconomics by displacement of residents, loss of timber, loss of property, loss of seasonal tourism, and the cost of fire suppression; however, the increased potential for fire risk associated with the Proposed Action would be low (see Section 4.2.1). Training activities involving chaff and flare would continue to adhere to existing safety protocols, and the Proposed Action would not result in impacts on socioeconomics above existing conditions.

The Proposed Action is not expected to disproportionately affect minority or low-income populations. There are no significant adverse environmental impacts associated with the Proposed Action.

As described in Section 4.4.1, adverse noise impacts would be associated within R-4201A/B. There are noise abatement areas around some of these residences (Guthrie Lakes and KP Lakes). Furthermore, noise impacts under the Proposed Action would not be significant. Although there is one CT—CT 9603—under R-4201 that was identified as a low-income population, the impacts of noise on this community would not be expected to be disproportionately higher in comparison to other communities located within the same county and under R-4201. No significantly adverse human health impacts have been identified for the Proposed Action (see Section 4.2, Safety; Section 4.3, Air Quality; and Section 4.4, Noise); therefore, no further site-specific analysis or mitigation related to environmental justice would be warranted. Impacts would not be significant.

4.9.2 Alternative B: No Steelhead Low MOAs

Effects on socioeconomics, environmental justice, and protection of children under Alternative B would be comparable to those described in Section 4.9.1, but with reduced impacts on Iosco, Arenac, Huron, and Sanilac Counties from the elimination of the low-altitude flying areas associated with the Steelhead Low North and Steelhead Low East MOAs. Impacts would not be significant.

4.9.3 Alternative C: No Grayling East or West MOAs

Effects on socioeconomics, environmental justice, and protection of children under Alternative C would be comparable to those described in Section 4.9.1, but with reduced impacts on Otsego, Montmorency, Oscoda, Crawford, Roscommon, and Ogemaw Counties from the elimination of the low-altitude flying areas associated with the Grayling West MOA. Impacts would not be significant.

4.9.4 Alternative D: No Action Alternative

Under the No Action Alternative, the socioeconomic environment would remain comparable to those described in Section 3.9. No changes in the Alpena SUA Complex would occur. Impacts would not be significant.

Chapter 5. Cumulative Effects

Cumulative effects are those impacts that result in the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. The cumulative effects analysis qualitatively considers other reasonably foreseeable projects occurring within the same time frame and geographic extent as the Proposed Action. This EA does not consider future actions that are speculative.

The proposed Alpena SUA modifications would occur over a land area covering just under 10,000 square miles. Given this large area, the identification of projects considered for potential cumulative effects focused on large projects affecting the airspace.

Camp Grayling Expansion. The Michigan Army National Guard is in the early planning stages to expand Camp Grayling. Under this proposal, soldiers would perform low-impact training to prepare for modern warfare. If approved, the expanded training area would be used for periodic, low-impact activities such as drone operation, cyber, electronic warfare, space, and communication system installation and operation (NGB, 2022). The proposal would more than double the Camp Grayling military training complex from 148,000 acres to roughly 320,000 acres in Crawford, Kalkaska, and Otsego Counties, with the expanded area encompassing MDNR-owned lands (House, 2022).

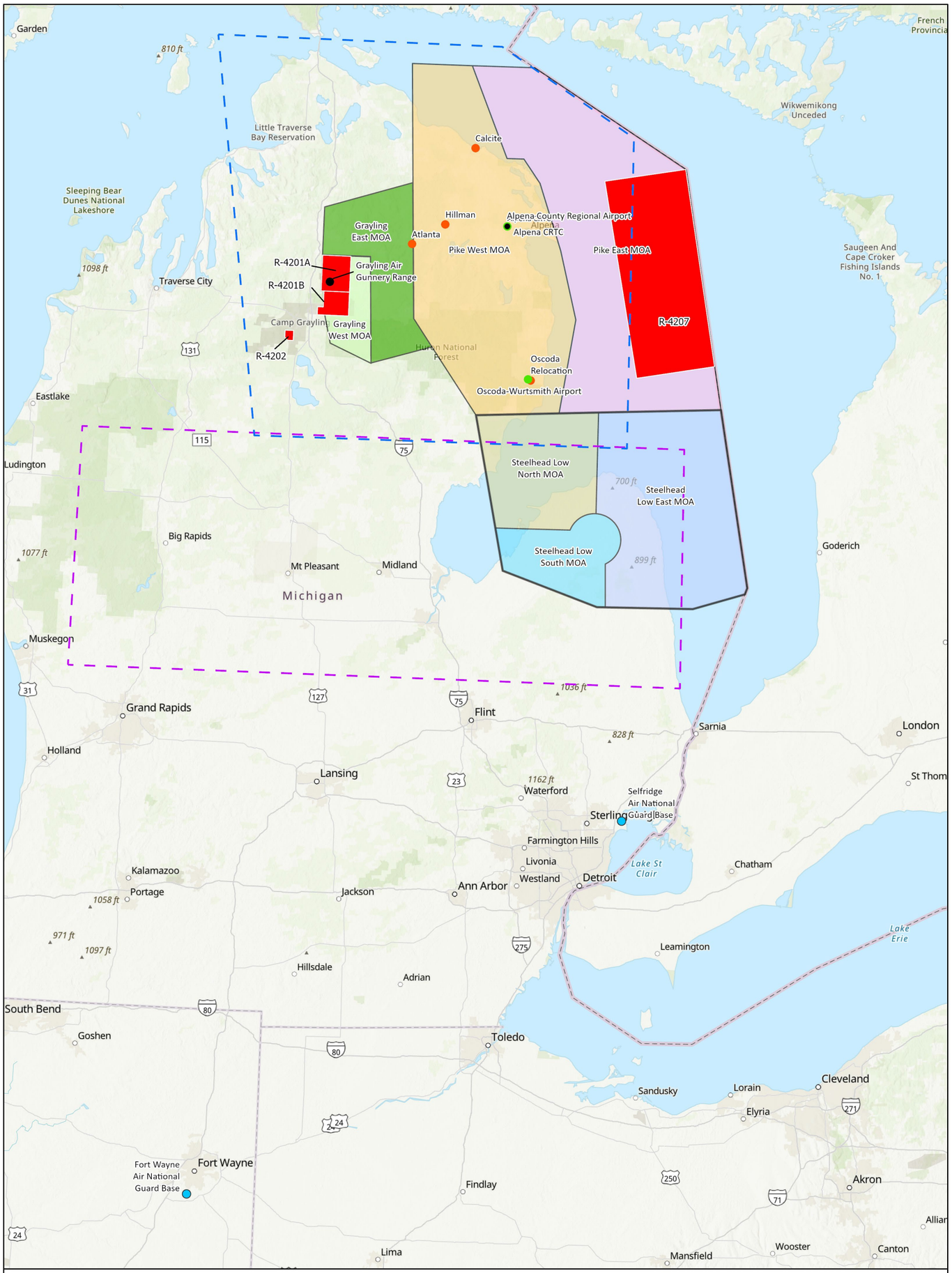
The Michigan Army National Guard is coordinating this proposal with MDNR, and, to date, MDNR has initiated a public review period in summer of 2022. MDNR will then consider the parcels being proposed for use and conduct an environmental review. It is anticipated that this proposal will continue to evolve during this process; NEPA analysis is forthcoming (MDNR, 2022a). Two of the six proposed expansion areas would overlap with R-4201A and the proposed Grayling East and West MOAs (MDNR, 2022b), so these proposals have some spatial overlap. The remaining proposed training areas are west and south of the Alpena SUA modifications. However, given that this project is in the earliest planning stages, even general levels of training are not known in order to provide a meaningful cumulative effects analysis in this EA. It is therefore not considered in further detail at this time for potential cumulative effects.

5.1 Projects Considered

Modernization of Overwater Ranges. NGB is in the preliminary stages of assessing overwater range activity that is suitable for the use of air-to-surface inert weapons, specifically for the MQ-9 weapons systems and other comparable users. NGB is preparing a proposal addressing the emerging need of overwater ranges capable of containing the weapons footprint of fielded and emerging stand-off weapons employed by ANG aircraft, such as air-to-ground missiles, lasers, and GPS-guided bombs. Four overwater ranges are being evaluated: R-4207, which is within the Alpena CRTC SUA, over Lake Huron; R-4305 at the convergence of Minnesota, Wisconsin, and Michigan over Lake Superior; R-5203 in New York over Lake Ontario; and R-6903 over Lake Michigan. No changes in charted airspace boundaries, altitudes, times of use, controlling agencies, or using agencies are planned at any of these overwater ranges. The location of R-4207 is shown in Figure 5-1.

Modernization of R-4207 is needed to account for the changes in usage with new stand-off weapons and aircraft platforms to include the development of unmanned aerial vehicles and fifth generation fighter aircraft. Separate NEPA documentation is anticipated at a later date. R-4207 is part of the Alpena SUA, and it is often scheduled in combination with the surrounding airspace and could be scheduled in combination with the proposed MOAs; therefore, future changes in R-4207 have a close causal relationship with this Proposed Action. The other overwater ranges (R-4305, R-5203, and R-6903) are removed somewhat from Alpena CRTC; while units may opt to use any of these airspaces, depending on specific training requirements and weather conditions, a causal relationship between changes in utilization at these ranges and the Proposed Action becomes harder to define. The timeline for implementing modernization of these overwater ranges is not certain. Therefore, potential changes in R-4207 in association with the Proposed Action are discussed only generally in this EA.

Figure 5-1 Locations of Projects in Cumulative Effects Analysis



Construction of Joint Threat Emitter (JTE) Sites within Alpena SUA Complex. NGB plans to construct and operate new Joint Threat Emitters (JTEs) across the Alpena SUA Complex. JTEs (see inset, right) simulate realistic integrated air defense training opportunities by creating high-density radiofrequency environments. Currently, MIANG has three permanent JTE sites, one each at Alpena CRTC, Grayling Range, and Oscoda-Wurtsmith Airport. NGB and MIANG have identified three new sites that would provide advantageous training across the airspace complex: Calcite Quarry in Presque Isle County; Atlanta Municipal Airport, Montmorency County; and Hillman Airport in Montmorency County. In addition, NGB and MIANG are considering relocating the existing Oscoda site approximately 4,300 feet to the southeast to minimize operational constraints. These locations are shown in Figure 5-1.

Joint Threat Emitter

(Smith, 2020)

Construction activities at each JTE site would be conducted over approximately three months and involve minor grading of a 1- to 1.5-acre site, concrete pads for a prefabricated structure and the JTE, fencing, gravel access, and electrical and communications interconnections. Operationally, JTEs would be transported by trailer to each site as scheduled for training, which would vary site by site and day by day. Each JTE would have a minimum standoff distance maximum of 1,365 feet around it when in operation; as determined necessary during site selection and development, sensitive areas would be shielded from radiofrequency emissions. Other operational safety considerations and measures would be incorporated into site-specific standard operating procedures.

Originally, the JTEs were considered as part of this proposed airspace modernization to maximize training opportunities across the airspace; it was removed from this project to allow additional time to explore siting options for JTEs. As the planning process progresses, different JTE sites may ultimately be identified, and separate NEPA analysis would be conducted as appropriate. As constructing and operating the JTEs has independent utility outside the airspace modifications, the JTEs are not required to be considered as a connected action, but they are considered as a cumulative action. Construction activities on the ground would not likely have cumulative interactions with airspace activities, but the added training assets throughout the airspace are considered for operational cumulative effects.

F-16 Mission Conversion at Fort Wayne ANGB. NGB proposes the full replacement of the A-10 mission to the F-16 mission for the 122d Fighter Wing (122 FW) out of Fort Wayne ANGB beginning in fiscal year 2023. The proposed F-16 mission conversion would increase annual airfield operations out of Fort Wayne International Airport, from approximately 4,032 A-10 operations to 4,400 F-16 operations. Proposed airfield operations would occur within the 122 FW's primary SUA (i.e., Twelve Mile/Hill Top MOAs, Jefferson Proving Ground MOAs/R-3403, Racer MOAs/R-3401, Buckeye/Brush Creek MOAs, and Red Hills MOA), but occasionally the 122 FW uses other airspace as weather alternates, including the Pike and Steelhead MOAs. The 122 FW conducts minimal operations in the Pike and Steelhead MOAs, which is not expected to change under the mission conversion. Ground-based components of the proposed F-16 conversion, including construction projects and increased personnel, would be geographically removed from this Proposed Action and

are not discussed in more detail for potential cumulative effects. NGB is preparing an EA for the F-16 mission conversion. The location of Fort Wayne ANGB in relation to the proposed Alpena SUA modifications is shown in Figure 5-1.

New Low-Altitude Tactical Navigation (LATN) Areas. Alpena CRTC established two new LATN areas within the Alpena SUA Complex: LATN Area North and LATN Area South, shown in Figure 5-1. The LATNs primarily support C-130 and A-10 operations. All flights are VFR and at or below 250 knots. During the bald eagle nesting season, eagle nests would be avoided by 1,000 feet vertically and one-half mile laterally. Other restrictions are also included to avoid populated or sensitive areas. Alpena CRTC was categorically excluded this action from further NEPA analysis, but this project is carried forward for potential cumulative effects because it is within the same airspace.

Foreign Military Sales (FMS) Pilot Training Center (PTC). The DAF is proposing to establish a permanent FMS PTC at either Ebbing ANGB, Arkansas, or Selfridge ANGB, Michigan. The FMS PTC would initially base up to 36 F-35 aircraft. An additional part of this action involves the Republic of Singapore relocating 12 F-16s from Luke Air Force Base, Arizona, to the FMS PTC location. The preferred location is Ebbing ANGB. An Environmental Impact Statement is being prepared (DAF, 2022).

If Selfridge ANGB were to be selected for the FMS PTC, syllabus training qualifying foreign military pilots to fly the F-35 would use regional airspace, including the Alpena SUA Complex. The basing decision is anticipated in fiscal year 2023. This project is carried forward for potential cumulative effects. The location of Selfridge ANGB in relation to the proposed Alpena SUA modifications is shown in Figure 5-1.

Singapore's F-16 training is being relocated from Luke Air Force Base, Arizona, due to F-35 mission growth at that installation. Singapore is also an F-35 FMS customer and expects deliveries to begin in 2026. The nation's desire is to collocate their F-16 training with an F-35 FMS training mission. If Selfridge ANGB is selected, syllabus training would occur, and it would use regional airspace, including the Alpena SUA Complex. This project is carried forward for potential cumulative effects.

Alpena County Regional Airport Growth. Alpena County Regional Airport opened a new passenger terminal and bridge in the spring of 2020. In the summer of 2020, the airport announced plans to construct a large hangar to store emergency response vehicles, up to 20 additional hangars, and an area where people can store boats and recreational vehicles. There are also plans to demolish the old terminal and construct a multipurpose events space that could double as a second terminal, if needed for future growth. These projects, which could be implemented by 2025, are discussed generally in this cumulative analysis for their contribution to growth. The location of Alpena County Regional Airport, collocated with Alpena CRTC, in relation to the proposed Alpena SUA modifications is shown in Figure 5-1.

Oscoda-Wurtsmith Airport Spaceport. Oscoda-Wurtsmith Airport was identified as a preferred location for a horizontal, low-orbit launch site for satellites. No formal project has yet been proposed, and so no detailed information is available as to specific requirements, timeline, or possible conflicts. Therefore, this project is not carried forward at this time for potential cumulative effects. The location of Oscoda-Wurtsmith Airport is shown in Figure 5-1.

5.2 Analysis

5.2.1 Airspace Management

Proposed modernization of R-4207 would account for different types of aircraft operations and weapons within that overwater restricted area; modernization is not projected to increase sorties within R-4207. Access to additional JTEs would increase configuration possibilities and benefit military training scenarios. Collectively, modernization of R-4207, additional JTEs, and the proposed additions and modifications of Alpena SUA would increase training efficiencies within the airspace complex, primarily for the 180 FW out of Toledo ANGB and the 127 WG out of Selfridge ANGB. Since increases in sorties are not proposed, impacts are not anticipated to be significant. The proposal to modernize R-4207 will be further developed and analyzed in a separate NEPA document, which may provide additional insights to airspace management at that time.

Proposed airfield operations for the 122 FW at Fort Wayne ANGB would occur within the 122 FW's primary SUA (i.e., Twelve Mile/Hill Top MOAs, Jefferson Proving Ground MOAs/R-3403, Racer MOAs/R-3401, Buckeye/Brush Creek MOAs, and Red Hills MOA). Occasionally Pike and Steelhead MOAs would be used as weather alternatives. In fiscal year 2019, the 122 FW flew 24 sorties in Pike East MOA, 28 sorties in Pike West MOA, and 4 sorties in Steelhead MOA (Alpena, 2018 and 2019). The number of sorties that they currently conduct at these MOAs is minimal, and that is not expected to change under the proposed F-16 mission conversion. Any operations within the Pike and Steelhead MOAs would be coordinated through Minneapolis ARTCC; therefore, impacts would not be significant.

Aircraft do not fly over the same geographic area in the new LATNs more than once per day. "Acrobatic type activities" that are conducted in MOAs are not conducted in a LATN area. Activities in LATNs are non-hazardous and consist of slow speeds; aircraft fly VFR. Flights within the LATNs are coordinated with the Minneapolis ARTCC so they do not conflict with other airspace usage.

Selfridge ANGB is being considered for the basing of F-35 and F-16 aircraft in association with the FMS PTC. Before a decision is made about aircraft basing, an environmental analysis will be completed to determine impacts, Therefore, if training were proposed at the Alpena SUA Complex with additional F-35 or F-16 aircraft, an assessment of airspace management would be completed to determine potential impacts.

Alpena County Regional Airport is underneath Pike West MOA. Under the Proposed Action, there would not be substantial changes to Pike East or West MOAs; no significant impacts would result from the Proposed Action or from the proposed F-16 mission at Fort Wayne ANGB. If additional changes to the Alpena SUA Complex were proposed, an assessment of airspace management would be conducted. Cumulative effects would not be significant.

5.2.2 Safety

Other cumulative actions would increase use of the Alpena SUA and surrounding airspace. Some of these users would be military, and others would be commercial and private aviators. Increased airspace users could increase the cumulative safety risks, as increases in aircraft flight activities are often associated with increased risk of aircraft mishaps, but, as stated in Section 4.2.1, research does not definitively support this due to the many factors that can result in a mishap (Congressional Research Service, 2003). Users of the airspace would continue to implement existing plans,

protocols, and approvals that promote safe flying. Cumulative effects would not be significant. Notably, potential safety risks associated with changes in types of aircraft operations and weapons training within R-4207 would be addressed in separate NEPA documentation. On-the-ground safety risks, such as localized high-frequency radiofrequency radiation during JTE operations, would also be addressed in separate NEPA documentation.

5.2.3 Air Quality

The proposed modernization of R-4207 could have minor changes in air emissions associated with changes in types of aircraft operations and weapons training, but these would likely be collectively negligible considered with the Proposed Action.

JTE operations could also locally and regionally increase criteria pollutant emissions from transporting the units via truck/trailer as scheduled for training, but these kinds of operations would also be regionally negligible when considered with the Proposed Action. The JTEs themselves would not emit air pollution during operations.

Increased aircraft operations from other activities, including F-35s and F-16s at Selfridge ANGB, F-16 conversion at Fort Wayne ANGB, and establishment of the LATNs, would incrementally add to criteria and greenhouse gas pollutant emissions from the combustion of fuel. The 122 FW at Fort Wayne only uses Pike and Steelhead MOAs as weather alternates, so their presence in the Alpena SUA would continue to be minimal. As the establishment of the LATNs was categorically excluded from detailed analysis, air emissions are presumed negligible. Cumulatively, these increased aircraft operations would not be expected to result in noticeably degraded air quality or contribute to violations of any NAAQS.

Proposed projects at Alpena County Regional Airport and Oscoda-Wurtsmith Airport suggest general regional growth. As the region grows, increased air and automobile traffic would also contribute to increased emissions, which could diminish air quality within more urbanized areas like Alpena. Cumulative effects would not be significant.

5.2.4 Noise

The proposed modernization of R-4207 would involve changes in types of aircraft operations and weapons training. Changes in operations and weapons in R-4207 would affect primarily noise-sensitive receptors in Lake Huron, compared with the noise-sensitive receptors in this Proposed Action that are primarily over land. Changes in the R-4207 noise environment would require additional analysis in separate NEPA documentation.

JTE operation at the new sites would not contribute cumulatively with the Proposed Action to the noise environment.

The 122 FW at Fort Wayne ANGB uses other airspace as weather alternates, including the Pike and Steelhead MOAs. In fiscal year 2019, the 122 FW flew 24 sorties in Pike East MOA, 28 sorties in Pike West MOA, and 4 sorties in Steelhead MOA (Alpena, 2018 and 2019). The number of sorties that they currently conduct at these MOAs is minimal, and that is not expected to change under the proposed F-16 mission conversion.

LATNs require that no aircraft fly over the same geographic area more than once per day. The LATNs mainly support C-130 and A-10 aircraft flying at or below 250 knots. One aircraft flying over

a single area per day would not significantly increase the noise levels in any SUA. Per the LATN restrictions, pilots strive to avoid populated and noise-sensitive areas.

Selfridge ANGB is being considered for the basing of F-35 and F-16 aircraft in association with the FMS PTC. Before a decision is made about aircraft basing, an environmental analysis will be completed to determine impacts at the installation and at any airspace that the aircraft might train in, including potential noise impacts. Therefore, if training were proposed at the Alpena SUA with additional FMS F-35 basing or Singapore F-16 relocation, a noise analysis would be completed to determine potential impacts.

Most of the projects proposed at Alpena County Regional Airport include facilities to store emergency and recreational vehicles. Although there could be some minor construction noise impacts on the adjacent population, long-term operations on noise are not expected. If projects were to occur where a large increase in aircraft operations was expected, an analysis would be completed to estimate noise impacts.

Cumulative effects on noise would not be significant.

5.2.5 Land Use

The cumulative projects discussed could result in some localized changes in land use, but cumulative effects on land use would not be significant within the region.

5.2.6 Water Resources

Airspace actions would involve no ground disturbance, and, therefore, have little potential for cumulative effects on sensitive water resources.

5.2.7 Biological Resources

The proposed modernization of R-4207 would involve changes in types of aircraft operations and weapons training over Lake Huron. Potential impacts of R-4207 modernization on bird, bat, and aquatic species would be addressed in separate NEPA documentation. As the Proposed Action would involve minimal changes in Pike East MOA, reasonably foreseeable additive impacts are not expected. Changes in the R-4207 noise environment would require additional analysis in separate NEPA documentation. Section 7 consultation pursuant to the Endangered Species Act would also be conducted, as needed.

Airspace actions could result in additional noise that could affect wildlife within the overall region, but the cumulative airspace actions would not be expected to provide any noticeable or significant noise impacts. The new LATNs are within the same airspace as the proposed SUA, and altitudes range from 300 feet to 1,500 feet AGL. However, per the LATN restrictions, aircraft do not fly over the same geographic area in the new LATNs more than once per day, and wildlife areas are avoided to the maximum extent practicable. Measures described in Section 4.7.1 to reduce bird-aircraft strike and nesting bald eagle disturbance are implemented within the LATNs.

For these reasons, cumulative effects on biological resources would not be significant.

5.2.8 Cultural Resources

The proposed modernization of R-4207 would involve changes in types of aircraft operations and weapons training over Lake Huron, which includes Thunder Bay National Marine Sanctuary and

other known cultural resources. Potential impacts of R-4207 modernization on those cultural resources would be addressed in separate NEPA documentation. As the Proposed Action would involve minimal changes in Pike East MOA and would have no effect on Thunder Bay National Marine Sanctuaries, no reasonably foreseeable additive impacts would occur.

Depending on the noise analysis, and frequency of flights, for the LATN, the proposed MOAs could cumulatively add to the number of flights over historic resources, though a resource would experience no more than one additional overflight per day in the LATN. As such, cumulative impacts on cultural resources would not be significant. Section 106 consultation, including Native American coordination, pursuant to the National Historic Preservation Act would also be conducted, as required for each undertaking.

5.2.9 Socioeconomics and Environmental Justice

Growth at Alpena County Regional Airport would be expected to provide benefits to the socioeconomics within the Alpena County region. The other projects concern airspace and would not have a significant, cumulative effect on socioeconomics when considered with the Proposed Action. Other cumulative actions would not adversely affect socioeconomics within the study area. Therefore, cumulative effects on socioeconomics would not be significant.

Chapter 6. Management Actions / Special Procedures

The analysis in Chapter 4 does not identify any significant impacts from implementation of the Proposed Action or alternatives. The following discusses specific management actions or special procedures from Chapter 4 that would minimize adverse effects on the environment or human health and safety.

As discussed in Section 2.1, the following measures would be incorporated into the Proposed Action upon implementation. These measures were developed through previous environmental scoping and review efforts to reduce potential impacts:

- In the Steelhead Low MOAs, participating aircraft would be restricted to fly no lower than 1,500 feet AGL within one nautical mile of the Lake Huron shoreline only between May 15 and September 15.
- No F-35 aircraft would be allowed in the Steelhead Low North, South, and East MOAs.
- The shape and altitude of the Steelhead Low South MOA were designed to enable civil flight operations around Huron County Memorial Airport without entering military airspace.
- The airspace legal description requirement would include that the airspace must be activated by NOTAM at least four hours in advance.
- The MIANG would enter into a LOA with Minneapolis Center and Cleveland Center to establish procedures for real-time separation and use of the airspace to allow civilian IFR aircraft access through the MOAs.

Biological Resources (Section 4.7)

Bald eagles occur throughout the SUA. The following guidelines would be implemented to minimize potential effects on bald eagles:

- Avoid operating aircraft within 1,000 feet of bald eagle nests during the breeding season (December through August), except where eagles have demonstrated tolerance for such activity.
- Avoid use of the secondary crossing runway at Alpena County Regional Airport, especially during the breeding season from December through August.
- Maintain 1,000 feet of vertical and horizontal distance from known foraging areas and communal roost sites.
- Follow the National Bald Eagle Management Guidelines for activities other than aircraft operations around eagle nests.

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