

FINAL

**ENVIRONMENTAL ASSESSMENT FOR
MANAGEMENT OF VEGETATION
AIRFIELD CLEARANCES AT FELKER
ARMY AIRFIELD**

**DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS, VIRGINIA**



December 1, 2017

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ACRONYMS AND ABBREVIATIONS

| | |
|--------|---|
| ABPP | American Battlefield Protection Program |
| ACHP | Advisory Council on Historic Preservation |
| AFB | Air Force Base |
| AFI | Air Force Instruction |
| BASH | Bird Aircraft Strike Hazard |
| BCE | Before Common Era |
| BMP | Best Management Practice |
| CAA | Clean Air Act |
| CBPA | Chesapeake Bay Preservation Act |
| CBPO | Chesapeake Bay Preservation Ordinance |
| CE | Common Era |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| CZMA | Coastal Zone Management Act |
| CWA | Clean Water Act |
| dB | decibel, a unit of sound measure |
| dBA | a-weighted decibels, as sound is perceived by humans |
| DNL | Day Night Sound Level |
| DoD | Department of Defense |
| DoDI | Department of Defense Instruction |
| EA | Environmental Assessment |
| EIAP | Environmental Impact Analysis Process |
| EO | Executive Order |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| FICUN | Federal Interagency Committee on Urban Noise |
| FONPA | Finding of No Practicable Alternative |
| FONSI | Finding of No Significant Impact |
| GHG | Greenhouse Gas |
| ICRMP | Integrated Cultural Resources Management Plan |

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| IICEP | Interagency/Intergovernmental Coordination for Environmental Planning |
| INRMP | Integrated Natural Resources Management Plan |
| IPAC | Information, Planning, and Consultation |
| IRP | Installation Restoration Program |
| JBLE-Eustis | Joint Base Langley Eustis-Fort Eustis, formerly Fort Eustis |
| LIDAR | Light Detection and Ranging |
| MBTA | Migratory Bird Treaty Act |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NO _x | Nitrogen Oxides |
| NRHP | National Register of Historic Places |
| RCRA | Resource Conservation and Recovery Act |
| RMA | Resource Management Areas |
| RPA | Resource Protection Areas |
| ROI | Region of Influence |
| SHPO | State Historic Preservation Office |
| tpy | tons per year |
| UFC | Unified Facilities Criteria |
| USACE | U.S. Army Corps of Engineers |
| USAF | U.S. Air Force |
| USEPA | U.S. Environmental Protection Agency |
| USC | U.S. Code |
| USFWS | U.S. Fish and Wildlife Service |
| VAC | Virginia Administrative Code |
| VDACS | Virginia Department of Agriculture and Consumer Services |
| VDEQ | Virginia Department of Environmental Quality |
| VDGIF | Virginia Department of Game and Inland Fisheries |
| VMRC | Virginia Marine Resources Commission |
| VOC | Volatile Organic Compound |

**FINAL
FINDING OF NO SIGNIFICANT IMPACT &
FINDING OF NO PRACTICABLE ALTERNATIVE**

**MANAGEMENT OF VEGETATION AIRFIELD CLEARANCES AT FELKER ARMY
AIRFIELD**

JOINT BASE LANGLEY EUSTIS-FORT EUSTIS, VIRGINIA

Pursuant to the provisions of the National Environmental Policy Act (NEPA), 42 U.S. Code (USC) 4321 *et seq.*, implementing Council on Environmental Quality (CEQ) regulations, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP), the U.S. Air Force (USAF) conducted an assessment of potential environmental consequences to manage vegetation clearances at the Felker Army Airfield, Joint Base Langley Eustis-Fort Eustis (JBLE-Eustis) as proposed by the 633rd Air Base Wing. This Environmental Assessment (EA), *Management of Vegetation Airfield Clearances at Felker Army Airfield*, considers potential impacts of the Proposed Action on the natural and human environments.

Proposed Action and Alternatives

Vegetation composition and heights have not been maintained in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning Design* (UFC) 3-260-01 at the Felker Army Airfield that is located at the JBLE-Eustis.

The *purpose* of the Proposed Action is to attain and maintain vegetation clearances within the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone (for definitions of the surfaces and the Clear Zone, please refer to the Section, *Background*) at the Felker Army Airfield, JBLE-Eustis that provide the adequate margins of safety for aircraft take-offs and landings in accordance with the UFC 3-260-01 to the maximum, practical extent.

The *need* to attain and maintain vegetation clearances at the Felker Army Airfield was cited in the triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency inspection teams on May 30, 2014.

Implementation of the Proposed Action would result in meeting the UFC 3-260-01 vegetation clearance requirements within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone and maintaining compliance with the criteria over time to the maximum, practical extent.

Background

The Primary Surface is an area that encompasses the runway and extends 200 feet in length from each end of the runway and 500 feet from the centerline of the runway. The Clear Zone extends 3,000 feet in length from the ends of the runway and 500 feet in width from either side of the centerline of the runway. Per the UFC 3-260-01, no trees or shrubs are allowed within the Primary Surface. Within the EA we describe impacts within six distinct geographic portions of the Clear Zone: Clear Zone 1, Clear Zone 2, and Clear Zone 3. Clear Zone 1 is described as the initial 1,000 feet of the Clear Zone extending in length from the ends of the runway, Clear Zone 2 is described as the next 1,000 feet of the Clear Zone, and Clear Zone 3 is described as the furthest 1,000 feet of the Clear Zone extending from the ends of the runway. Per the UFC 3-260-01, it is preferable to remove trees within the entire Clear Zone (Clear Zone 1, Clear Zone 2, and Clear Zone 3) to reduce aircraft strike hazards, however, tree and shrub removal is only required in the Clear Zone 1. Within Clear Zone 2 and Clear Zone 3, trees are permissible but are not allowed to penetrate an Approach–Departure Clearance Surface per the UFC 3-260-01. The Approach–Departure Clearance Surface is an imaginary surface (surface that cannot be seen) that extends from the Runway Overruns (the Runway Overruns extend 200 feet from the ends of the runway) into the air at a 40 horizontal: one vertical slope. Trees penetrating the Approach–Departure Clearance Surface are required to be topped to a height of 10 feet below the Approach–Departure Clearance Surface.

Alternative 1

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Cutting to Stumps in Clear Zone 2 and Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01, except in emergent wetlands. Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees will be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing will be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) following the final soil grading. Soil testing will be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface Area adjacent to the Clear Zone would be topped (cut to the required height) in accordance with the UFC 3-260-01. Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

Trees within Clear Zone 2 and Clear Zone 3 would be cut down to stumps as close to the ground surface as possible, leaving stumps eight inches or less in height. While the UFC 3-260-01 only requires tree topping in Clear Zone 2 and Clear Zone 3 to heights 10 feet below the Approach–Departure Clearance Surface, the additional cutting of the trees to stumps in Clear Zone 2 and Clear Zone 3 would further reduce potential tree aircraft strike hazards.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat (*Myotis septentrionalis*) and Indiana bat (*Myotis sodalis*) roosting and pupping habitats.

Tree removal, cutting, and topping operations will be controlled in accordance with forestry and stormwater best management practices (BMPs) to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs will be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down, or topped would be either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation will be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface will be maintained as herbaceous vegetation, not to exceed eight inches in height, except in emergent wetlands. Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights will be assessed via a Light Detection and Ranging (LIDAR) analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation will continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

Alternative 2

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1, Tree Cutting to Stumps in Clear Zone 2, and Tree Topping in Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01, except in emergent wetlands. Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees will be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing will be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) following the final soil grading. Soil testing will be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01. Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

Trees within Clear Zone 2 would be cut as close to the ground surface as possible, leaving tree stumps no higher than eight inches. While the UFC 3-260-01 only requires tree topping in Clear Zone 2 to heights 10 feet below the Approach–Departure Clearance Surface, the additional cutting of the trees to stumps would further reduce potential tree-aircraft strike hazards.

In Clear Zone 3, trees would be topped in accordance with the UFC 3-260-01. Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Tree removal, cutting, and topping operations will be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs will be used to prevent and mitigate any potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down, or topped would be either be or sold as timber or disposed of offsite. Trees identified for removal will be

offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance will be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface will be maintained as herbaceous vegetation, not to exceed eight inches in height, except in emergent wetlands. Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights will be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation will continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

Alternative 3 (Preferred Alternative)

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Topping in Clear Zone 2 and Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01, except in emergent wetlands. Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees will be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing will be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) within seven days of the final soil grading. Soil testing will be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01. Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

In Clear Zone 2, trees would be topped in accordance with the UFC 3-260-01. Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 18 feet to 43 feet in the Clear Zone 2. In Clear Zone 3, trees would also be topped in accordance with the UFC 3-260-01. Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Vegetation management operations within the Primary Surface and the clear zones will be controlled in accordance forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs will be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down or topped would either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation will be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface will be maintained as herbaceous vegetation, not to exceed eight inches in height (except in emergent wetlands). Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights will be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation will continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and the Felker Army Airfield would continue to have hazardous vegetation that is not managed in accordance with the UFC 3-260-01. Under the No Action Alternative, the safety conditions will degrade further over time, as more trees continue to grow in height and expand upon their current footprint in the Region of Influence (ROI). Grassy areas will continue to be managed in the areas adjacent

to the Landing Zone in accordance with the UFC 3-260-01. Eventual closure of operations, starting with instrument approaches, and eventually cessation of flight operations, would occur if a vegetation maintenance program is not implemented or a UFC 3-260-01 waiver for all applicable areas is not obtained.

Summary of Findings

Based on the information and analyses provided in the EA, implementation of the proposed action would not result in significant impacts to the natural or human environment. In addition, no significant cumulative adverse impacts would result from activity associated with the Proposed Action when considered in conjunction with recent, past, and future projects at the JBLE–Eustis. Wetland impacts would be mitigated through purchasing of mitigation bank or in-lieu fee credits and therefore, no significant impacts to wetlands would result from implementation of the Proposed Action.

Eleven areas of environmental consequences evaluated in detail in the EA were determined to have the potential to result in less than significant impacts with implementation of the Preferred Alternative (Alternative 3) as described below:

- **Land Use.** Long-term, adverse impacts to land training operations that include navigation training, ambush training, and reconnaissance training would occur following the tree removal, cutting, topping and mowing operations. Because these training operations are affected by visibility of the terrain, these training operations would be negatively impacted by reductions in vegetation cover and vegetation height. However, implementation of the Preferred Alternative would not preclude training activities. Overall, impacts to land use would be less than significant.
- **Noise.** Short-term, adverse impacts to the noise environment would result from the operation of logging equipment, brush mowers, and forest mowers. Areas with reduced tree cover may conduct sound further; however, extensive forested areas surround the Affected Environment (or Region of Influence). Noise levels would not exceed the nearby City of Newport News noise ordinance and BMPs to minimize noise effects would be implemented. Overall, impacts to the noise environment would be less than significant.
- **Air Quality.** Short-term, adverse impacts to air quality would result from emissions released from operation of logging equipment, brush mowers, and forest mowers. Increased emissions are not anticipated to exceed *de minimus* thresholds. Greenhouse gas (GHG) emissions resulting from operation of heavy equipment and mowing would remain well below 25,000 tons per year (tpy). Overall impacts to air quality would be less than significant.

- **Water Resources.** Forestry and stormwater BMPs would be implemented to mitigate any potential erosion and sedimentation impacts that could result from vegetation removal, cutting, and topping operations that have the potential to impact surface water quality. Overall, there would be less than significant impacts to surface water and water quality. There would be no anticipated impacts to groundwater. Implementation of any of the action alternatives would not result in any significant alternation in the hydrology and would not divert overland floodwater flow. Existing structures in the ROI that consist of the supporting buildings and infrastructure for the Felker Army Airfield would not be at increased risk of flooding from implementation of any of the action alternatives. Overall, there would be less than significant impacts to floodplain management.
- **Safety and Occupational Health.** A long-term, beneficial margin of safety for aircraft take-offs and landings at the Felker Army Airfield would result from the improved vegetation clearances. Effects to bird or wildlife strike risks is uncertain; however, the cutting of trees to stumps and topping of trees would likely reduce nesting and foraging habitat for a variety of bird species. This may reduce some existing Bird Aircraft Strike Hazards (BASH). However, the increased open, herbaceous area in the Primary Surface and Clear Zone 1 may increase BASH hazards for some species, such as geese, that prefer open water and grassy foraging areas. Personnel or contractors would follow all required standard operating procedures and would be responsible for complying with all applicable health and safety plans and regulations including wearing required Personal Protective Equipment. Base personnel would be excluded from work zones. Overall, there would be less than significant impacts to safety and occupational health.
- **Hazardous and Toxic Materials and Wastes.** Any hazardous substances, petroleum contaminants, or contaminated soils generated would be disposed of in accordance with federal, state, and local regulations. The Affected Environment is not located within any Solid Waste Management Unit, Environmental Restoration Program site, or Area of Concern. Overall, impacts to hazardous materials and wastes would be less than significant.
- **Biological Resources.** Short-term to long-term, adverse impacts to vegetation/wildlife habitat, and wildlife resources would occur. Implementation would result in the conversion of some forested wetlands and forested uplands to herbaceous vegetation. Species composition of wildlife could be altered, with some mortality of species with limited mobility and movement of wildlife to other nearby similar habitats; however, this alteration would not significantly impact local wildlife populations. Topping of trees could also cause increased tree mortality and make trees more susceptible to pests and diseases. Topping could also result in rapid regrowth of branches which may become hazardous to

aircraft. Impacts to wetlands resulting from vegetation removal operations would be mitigated for and therefore, no net loss of wetlands would occur, nor any overall loss to wetland function. Long-term conversions and loss of forested and shrubby habitat would result in the permanent loss of habitat for some species including some migratory birds and federally listed bat species. A native, perennial seed mixture would be planted at tree removal sites. There would be no effect to critical habitat as none exists in the Action Area. Potential impacts to nesting migratory birds and listed bat species that could be roosting and pupping will be mitigated by implementation of a time of year restriction. Overall, because of the time of year restriction and the potential presence of federally listed bat species, implementation of the Preferred Alternative may affect, but is not likely to adversely affect any federally listed species. Impacts to state listed bat species would be at the same level of impacts as the federally listed bat species. During operation of heavy equipment and mowers, motile wildlife will move away from the disturbance and noise impacts to similar, nearby habitats. There could be mortality of less mobile species, such as frogs, lizards, salamanders, snakes, turtles, and toads that cannot move away from the impact. The time of year restriction would protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats. Overall, impacts to these species would be less than significant based on the scale of the project, the time of year restriction, and the ability of the more motile wildlife to move away from the impacts. Overall, impacts to biological resources would be less than significant.

- **Cultural Resources.** Best management practices to mitigate soil disturbances and erosion will mitigate potential impacts to cultural resources that exist in the Area of Potential Effect (or ROI). At tree removal sites, stumps will be individually ground down and roots will be hand cut to minimize soil disturbances. A native, perennial seed mixture will be planted at tree removal sites to stabilize the soil surface. All cultural resources sites will be marked with a 50 foot buffer as sensitive areas where ground disturbance is to be minimized. Overall, there would be no adverse impacts to cultural resources and impacts would be less than significant.
- **Geology and Soils.** Forestry and stormwater BMPs will be implemented to prevent and mitigate potential erosion and sedimentation impacts that have the potential to cause short-term, adverse impacts to soils. At tree removal sites, individual tree stumps will be ground down and roots would be hand cut to minimize soil disturbances. Following tree removal, a native perennial seed mixture would be planted to stabilize soil surfaces. Overall, impacts to geology and soil resources would be less than significant.
- **Transportation and Circulation.** Short-term, adverse impacts to transportation and circulation would occur. Heavy haul trucks and trucks containing equipment and mowers would generate increased trips along the road network used to access the JBLE-Eustis and

the JBLE-Eustis military routes/road network. It is not anticipated that existing road capacities would be exceeded or require any type of modification. No anticipated road closures or re-routing of traffic is anticipated on the road network used to access the JBLE-Eustis or military routes/roads at the JBLE-Eustis. Overall, impacts to transportation and circulation would be less than significant.

- **Aesthetics and Visual Resources.** Long-term, adverse impacts to the viewshed would occur because tree-dominated habitats will be converted to herbaceous-dominated habitats and habitats with topped trees. While implementation of the Preferred Alternative would result in an alteration of the local viewshed, it would still remain a relatively, undeveloped, natural area (with the exception of the existing runway and surrounding buildings and infrastructure). Overall, impacts to aesthetics and visual resources would be less than significant.

Mitigation Measures

During construction and maintenance, forestry and stormwater BMPs would be followed. Stormwater BMPs will be used to prevent and mitigate erosion and sedimentation impacts that have the potential to cause adverse impacts to soils as well as water quality. A time of year restriction for tree removal would be followed to minimize potential impacts to federally listed bat species. In addition to the standard construction and maintenance BMPs and mitigation for impacts to federally listed bat species, additional standard mitigation measures for impacts to jurisdictional wetlands would be specified in associated permit requirements. These permit conditions would require that the Proposed Action:

- Avoid wetland and water impacts where practicable;
- Minimize potential impacts to wetlands and waters; and
- Compensate for any remaining, unavoidable impacts to wetlands.

As required per Section 404 of the Clean Water Act, as amended, and Executive Order (EO) 11990, wetland mitigation will be required to compensate for impacts resulting from tree removal within the jurisdictional limits of emergent and forested wetlands. Wetland mitigation credits will be purchased from an approved mitigation bank or in-lieu fee program within the servicing area to compensate for the wetland loss. A formal mitigation plan consistent with the requirements of 32 CFR 989.15 and 32 CFR 989.22(d) has been developed and will be finalized during the permitting process prior to project implementation.

Finding of No Significant Impact & Finding of No Practicable Alternative

Based upon my review of the facts and analyses contained in the attached EA, conducted in accordance with the provisions of NEPA, CEQ Regulations, and 32 CFR Part 989, I conclude that the Proposed Action would not have a significant environmental impact, either by itself or

cumulatively with other ongoing operations and projects at JBLE-Eustis; would not involve an element of high risk or uncertainty on the human environment; and that its effects on the quality of the human environment would not be highly controversial.

Pursuant to EO 11988, *Floodplain Management* and the authority delegated by the Secretary of the Air Force Order 791.1, I find there is no practicable alternative to maintaining vegetation clearances associated with the Proposed Action, and that any effective solution would require activities within floodplains. Also, pursuant to EO 11990, *Protection of Wetlands*, I find there is no practicable alternative for implementing the Proposed Action that would similarly maintain the airfield clearances at the Felker Army Airfield. The USAF further finds all practicable measures have been taken to minimize harm to the floodplain and wetlands, and BMPs that will minimize impacts are documented in the EA. This finding fulfills both the requirements of the references EOs and 32 CFR 989.14 requirements for a Finding of No Practicable Alternative (FONPA). Accordingly, an Environmental Impact Statement is not required. The signing of this Finding of No Significant Impact and FONPA completes the EIAP.

Approved by:

David F. Kattler, Colonel, USAF
Chief, Civil Engineering Division

DATE

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MANAGEMENT OF VEGETATION AIRFIELD CLEARANCES AT
FELKER ARMY AIRFIELD
DEPARTMENT OF THE AIRFORCE
633RD AIRBASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS, VIRGINIA**

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1 PURPOSE AND NEED

The Triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency inspections teams cited vegetation clearances at the Felker Army Airfield, Joint Base Langley Eustis-Fort Eustis (JBLE-Eustis) are not in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning Design* (UFC) 3-260-01 (The citation is provided in Appendix A.). This Environmental Assessment (EA) identifies, describes, and evaluates potential environmental impacts associated with the implementation of the proposed action to attain and maintain vegetation clearances in accordance with the UFC 3-260-01 at the JBLE-Eustis to maintain the proper margin of safety for aircraft take-offs and landings to the maximum, practical extent. This EA has been prepared in accordance with regulations issued by the Department of Defense (DoD), 32 Code of Federal Regulations (CFR) Part 989, Environmental Impact Analysis Process (EIAP). Consistent with Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) (40 CFR Parts 1500–1508, Section 1502.13), this section specifies the purpose of and the need for the Proposed Action for the 633rd Air Base Wing.

1.1 LOCATION AND BACKGROUND

The JBLE-Eustis is approximately 160 miles south-southeast of Washington, D.C., 60 miles southeast of Richmond, 10 miles southeast of Williamsburg, and 30 miles northwest of Norfolk. The JBLE-Eustis is located in the Hampton Roads area of Southeast Virginia on the southwest side of the Virginia Peninsula, bordered by the James River and Warwick River (Figure 1-1). The installation is within the City of Newport News and is located on the eastern shoreline of the James River, approximately 30 miles upstream of its confluence with the Chesapeake Bay. It is bordered on the west and south by the James River; and on the east by the Warwick River, which separates JBLE-Eustis from civilian residential areas in the City of Newport News.

Mulberry Island (approximately 5,400 acres) is an adjacent peninsula separated from the main installation by a drainage way from the James River to Warwick River. It is used primarily for military field training purposes, but does include some infrastructure including the Pines Golf Course and Felker Army Airfield. Felker Army Airfield is located outside of the cantonment area, west of the Pines Golf Course (which is also west of the cantonment area) on Mulberry Island. The airfield, including its associated infrastructure, is the main developed area on Mulberry Island.

Fort Eustis is a joint base installation that was reorganized as JBLE-Eustis with Langley Air Force Base in 2010 in accordance with the Base Realignment and Closure 2005 Major tenant organizations at JBLE-Eustis include the 7th Transportation Brigade (Expeditionary), 128th Aviation Brigade, Headquarters Training and Doctrine Command, U.S. Army Applied Aviation Technology Directorate, Joint Task Force–Civil Support, and the Maritime & Intermodal Training Department of the U.S. Army Transportation School.

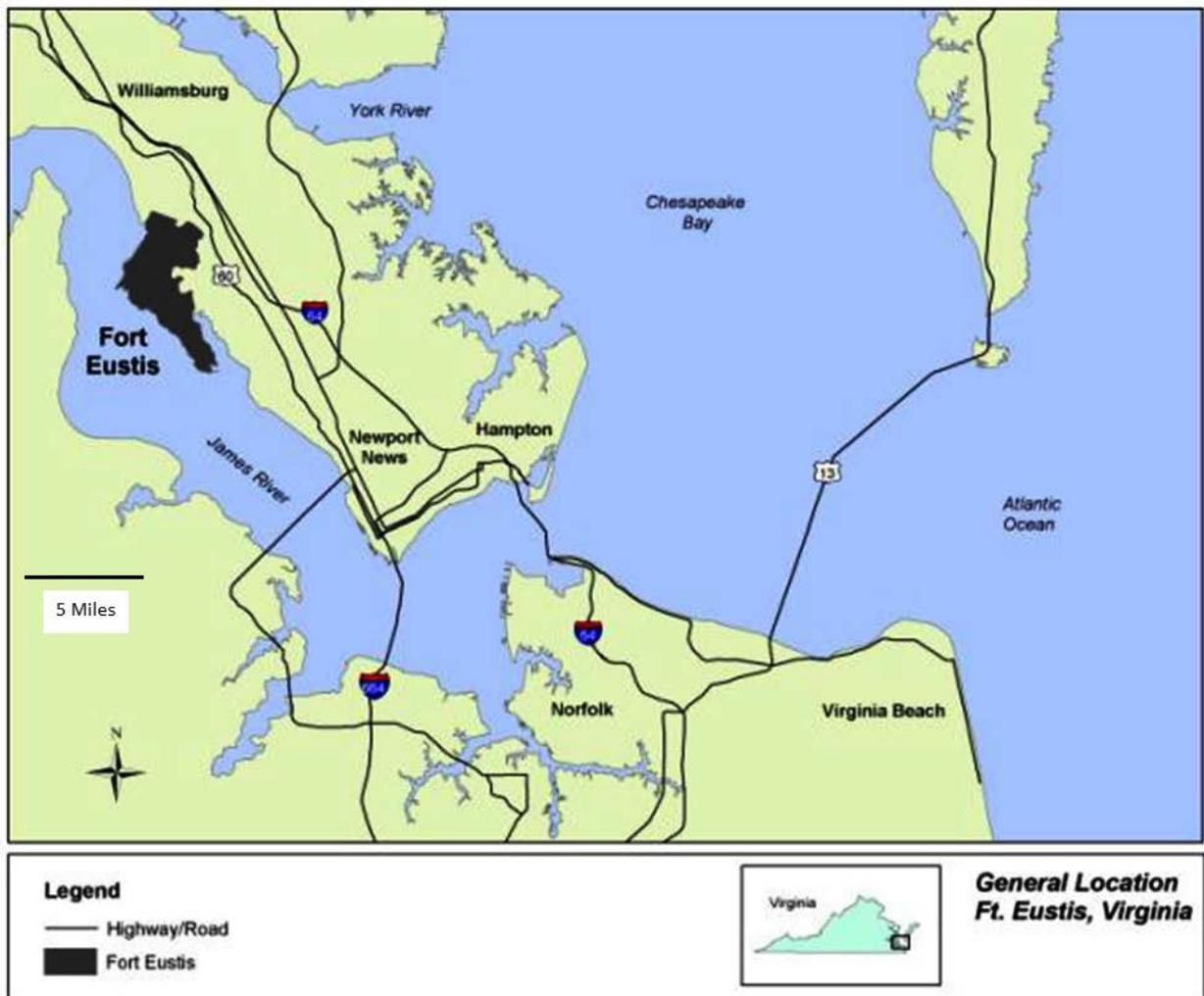


Figure 1-1. Location of the Joint Base Langley Eustis-Fort Eustis, Virginia

The JBLE-Eustis is a 7,869-acre facility primarily associated with logistics and transportation training. Most of JBLE-Eustis is used primarily for military training purposes. Mulberry Island, the mostly undeveloped portion of JBLE-Eustis that is used for training, also borders the Warwick River on its north side, making JBLE-Eustis a peninsula. Much of this area includes forested riparian and wetland habitat, tidal wetlands, non-tidal wetlands, and upland forested and early successional habitat. Numerous tidal creeks are also present.

The Felker Army Airfield contains a 3,020-foot-long by 75-foot-wide asphalt runway. It services various military rotor-wing aircraft and small to mid-sized fixed-wing aircraft for the DoD. The number of aircraft using the airfield varies daily. Certain aircraft are permanently stationed at the airfield as part of mission requirements, while other aircraft utilize the airfield for training purposes

or are transient. Both day and night operations take place with an average over 500 movements daily (Musser Personal Communication 2017).

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Purpose. The *purpose* of the Proposed Action is to attain and maintain vegetation clearances within the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone (for a definition of the surfaces and Clear Zone please refer to Section 2.3, *Vegetation Clearances Required Within the Airfield Surfaces and the Clear Zone*) at the Felker Army Airfield, JBLE-Eustis that provide the adequate margins of safety for aircraft take-offs and landings in accordance with the UFC 3-260-01 to the maximum, practical extent.

Need. The *need* to attain and maintain vegetation clearances at the Felker Army Airfield was cited in the triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency inspection teams on May 30, 2014 (Appendix A).

1.3 SUMMARY OF ENVIRONMENTAL STUDY REQUIREMENTS

The proposed activities addressed within this EA constitute a federal action and, therefore, must be assessed in accordance with NEPA, which requires federal agencies to consider the environmental consequences of proposed actions in the decision-making process (42 U.S. Code [USC] 4321 et seq.). The intent of NEPA is to protect, restore or enhance the environment through well-informed decisions by the federal decision maker. The CEQ was established under NEPA, 42 USC 4342 et seq., to implement and oversee federal policy in this process. In 1978, the CEQ issued regulations implementing the NEPA process under 40 CFR Parts 1500–1508. The U.S. Air Force (USAF) Environmental Impact Analysis Process for meeting CEQ requirements is accomplished via procedures set forth in CEQ regulations and 32 CFR Part 989.

1.4 COASTAL ZONE CONSISTENCY DETERMINATION

The Federal Coastal Zone Management Act (CZMA) (16 USC 1451 et seq.), creates a state-federal partnership to ensure the protection of coastal resources. The federal CZMA requires each federal agency within or outside the coastal zone, which affects any land or water use or natural resource uses of the coastal zone to be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the applicable State Coastal Management Program. Designated regions with the coastal habitats within the Commonwealth of Virginia are subject to the CZMA and the JBLE–Eustis is located entirely within the designated coastal zone.

The federal CZMA requires federal agencies carrying out activities subject to the Act to provide a “consistency determination” to the relevant state agency. The federal regulations implementing

the Act then require the state agency to inform the federal agency of its agreement or disagreement with the federal agency's consistency determination. Therefore, the Proposed Action and alternatives to the Proposed Action analyzed in this EA require the USAF to submit a consistency determination to the Virginia Department of Environmental Quality (VDEQ). The USAF's Consistency Determination is provided in Appendix B.

1.5 INTERGOVERNMENTAL COORDINATION AND CONSULTATION

Interagency/Intergovernmental Coordination for Environmental Planning (IICEP) is a federally mandated process for informing and coordinating with other governmental agencies regarding proposed actions. Through the IICEP process, the USAF has coordinated with the U.S. Fish and Wildlife Service (USFWS), State Historic Preservation Office (SHPO), the U.S. Army Corps of Engineers (USACE), and the VDEQ regarding the Proposed Action. The VDEQ utilizes the Virginia State Clearinghouse to route applications for federal activities such as EAs, to the appropriate state reviewers for them to provide comments and recommendations based on their statutory authorities. Four federally recognized Native American Tribes: the Pamunkey Tribe, the Catawba Indian Tribe, The Delaware Tribe and the Delaware Nation, were invited to consult on this action as well. Section 106, National Historic Preservation Act consultation with the SHPO has been concluded and they provided a concurrence determination that there would be no adverse effects to cultural resources on 11 September 2017. The Endangered Species Act (ESA), Section 7 Biological Evaluation was submitted to the USFWS on 30 November 2016 and the USFWS concurred with the findings of JBLE-Eustis that impacts to both the northern long-eared (*Myotis septentrionalis*) and Indiana bat (*Myotis sodalis*) species would be may affect, not likely to adversely affect. Intergovernmental coordination and consultation correspondence is provided in Appendix C.

1.6 PUBLIC INVOLVEMENT

The NEPA, 40 CFR 1500–1508 and 32 CFR Part 989 requires public review of the EA before approval of a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) and implementation of the Proposed Action. Further, because a FONPA is anticipated and in accordance with Executive Order (EO) 11998 (Floodplain Management), early notification was accomplished via a press release in the Daily Press on 12 July 2017 and government-to-government consultation was conducted with the Commonwealth of Virginia Clearinghouse and the USACE. A Notice of Availability for public review of the Final Draft EA was published in the Daily Press on 15 August 2017 and the Draft EA was made available for public review at the Groninger Library, located on the JBLE-Eustis installation, and the Grissom Library, located in Newport News, Virginia. The review period for public and agency comments was 60 days, ending on 14 October 2017. Comments received and responses to comments are provided in Appendix C, Agency, Public, and Tribal Coordination.

2 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This section of the EA provides a brief description of the history and missions supported at the Felker Army Airfield and a description of the Proposed Action and its alternatives, including the No Action Alternative. This section also describes alternatives considered but not carried forward for detailed analysis.

2.2 HISTORY OF THE FELKER ARMY AIRFIELD AND MISSION SUPPORT

The Felker Army Airfield was originally designed as the first heliport for the U.S. Military in 1952. The original design of the airfield was a revolutionary hard-surfaced wheel design with two runways that bisected a circular taxiway and eight landing pads on the outer rim. Along with the wheel airfield design, facilities were also constructed to accommodate an operational transportation helicopter company. Over time, the airfield has been upgraded due to technology changes and also shifting requirements. In the 1980's the Army began removing the wheel design and placed concrete slabs on the runway capable of holding 30 aircraft at a time. The airfield now has a paved runway and shoulders, an air traffic control tower, and a fire department (Figure 2-1).



Figure 2-1. Photograph depicting current conditions at the Felker Army Airfield

Since its inception, the Felker Army Airfield has supported training missions for pilots and maintenance personnel. Currently there are four units stationed at the Felker Army Airfield that consist of two research and development units, an administrative unit, and the 5th Battalion (General Support), 159th Aviation Regiment B Company. Today the airfield provides support for a wide array of helicopter and aircraft facilities that support the DoD including the Army, U.S. Marine Corps, the U.S. Navy, and the U.S. Coast Guard training mission and requirements. The airfield is ranked as one of the top five most used in the Army.

2.3 VEGETATION CLEARANCES REQUIRED WITHIN THE AIRFIELD SURFACES AND THE CLEAR ZONE

The Felker runway is considered a Class A, IFR runway; Class A runways are mainly intended to accommodate small, light aircraft and are not intended for use by high-performance and large, heavy aircraft. The UFC 3-260-01 (published in DoD 2008) provides design standards used for Class A, IFR runways that includes vegetation clearance requirements intended to provide the proper margin of safety needed for aircraft take-offs and landings.

This section provides a description of terms used in the UFC 3-260-01 as they pertain to a Class A, IFR runway and also details the vegetation clearance requirements described in the criteria for the airfield surfaces and the Clear Zone.

Primary Surface. The area that extends 200 feet in length from the ends of the runway and 500 feet in width from the centerline of the runway (Figure 2-2; Figure 2-3). Per the UFC 3-260-01, no trees or shrubs are allowed within the Primary Surface.

Overrun. The first 200 feet from each runway end, and the width of the runway, plus shoulders that is located within the Primary Surface. Per the UFC 3-260-01, no trees or shrubs are allowed within the Overrun (Figure 2-2; Figure 2-3).

Clear Zone. The area that starts at each runway end, and extends outward, 3,000 feet in length, and 1,000 feet in width (Figure 2-2; Figure 2-3). The Clear Zone overlaps 200 feet of the Primary Surface/Overrun that extends 200 feet beyond the runway ends.

Within the EA, we describe impacts within six distinct geographic portions of the Clear Zone: Clear Zone 1, Clear Zone 2, and Clear Zone 3 (Figure 2-2). Clear Zone 1 is described as the initial 1,000 feet of the Clear Zone extending in length from the ends of the runway, Clear Zone 2 is described as the next 1,000 feet of the Clear Zone, and Clear Zone 3 is described as the furthest 1,000 feet of the Clear Zone extending from the runway ends. Per the UFC 3-260-01, no trees or shrubs are allowed within the Clear Zone 1.

Approach-Departure Clearance Surface. The Approach-Departure Clearance Surface is an imaginary surface (surface that cannot be seen) that extends from the Runway Overrun into the air at a 40 horizontal: one vertical slope (Figure 2-3). Trees penetrating the Approach-Departure Clearance Surface within the Clear Zone 2 and Clear Zone 3 are required to be topped to a height of 10 feet below the Approach-Departure Clearance Surface.



Figure 2-2. Airfield Surfaces and the Clear Zone at the Felker Army Airfield

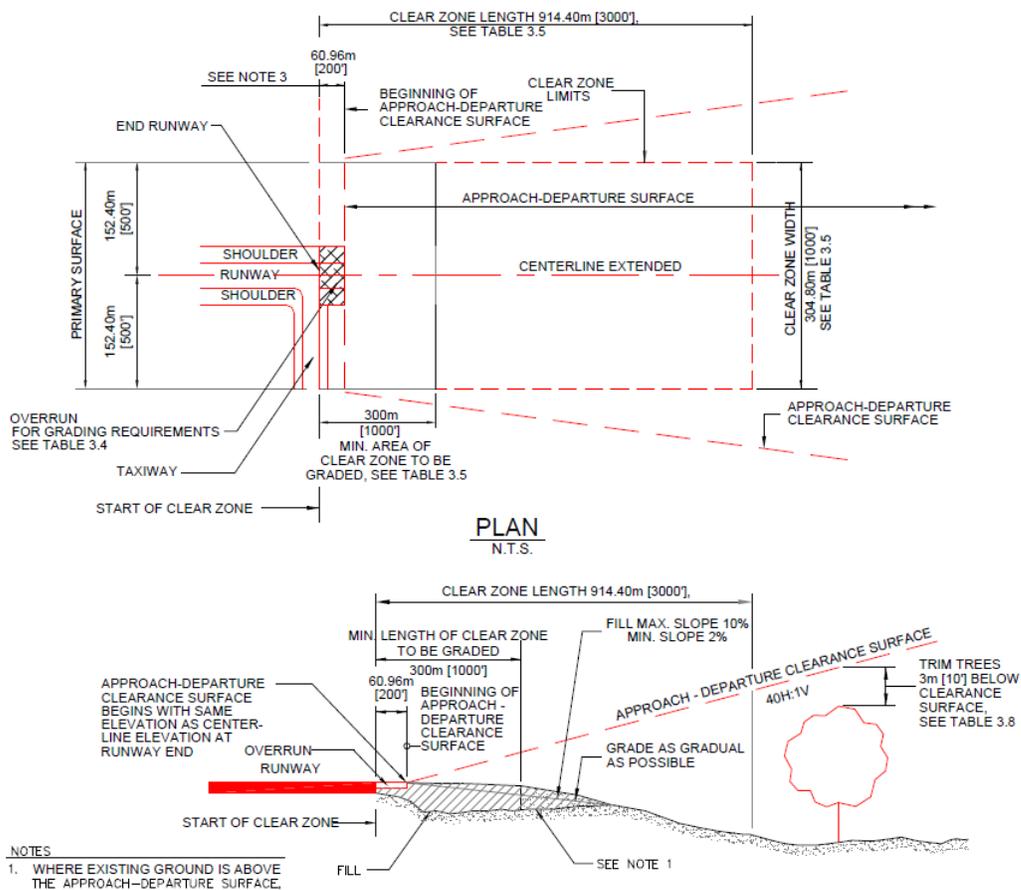


Figure 2-3. Airfield Surfaces and the Clear Zone for a Class A, IFR Runway (Department of Defense 2008)

2.4 PROPOSED ACTION

The proposed action provides an immediate as well as long-term solution to address vegetation maintenance to achieve the proper safety margins for aircraft take-offs and landings at the Felker Army Airfield at the JBLE–Eustis, meeting the purpose and need described in Section 1.2, *Purpose and Need for the Proposed Action*. Coordination with regulatory agencies is ongoing including finalization of the Wetland Mitigation Plan that would require approval from the USACE.

2.4.1 Alternative 1

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Cutting to Stumps in Clear Zones 2 and Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01, except in emergent wetlands (Figure 2-4). Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of

the Primary Surface and Clear Zone 1, trees would be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing would be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) following the final soil grading. Soil testing would be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped (cut down to the required height) in accordance with the UFC 3-260-01. Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

Trees within Clear Zone 2 and Clear Zone 3 would be cut down to stumps as close to the ground surface as possible, leaving stumps eight inches or less in height (Figure 2-4). While the UFC 3-260-01 only requires tree topping in Clear Zone 2 and Clear Zone 3 to heights 10 feet below the Approach–Departure Clearance Surface, the additional cutting of the trees to stumps in Clear Zone 2 and Clear Zone 3 would further reduce potential tree-aircraft strike hazards.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Tree removal, cutting, and topping operations would be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down, or topped would be either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation would be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface would be maintained as herbaceous vegetation, not to exceed eight inches in height (except in emergent wetlands). Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights would be assessed via a Light Detection and

Ranging (LIDAR) analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation would continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

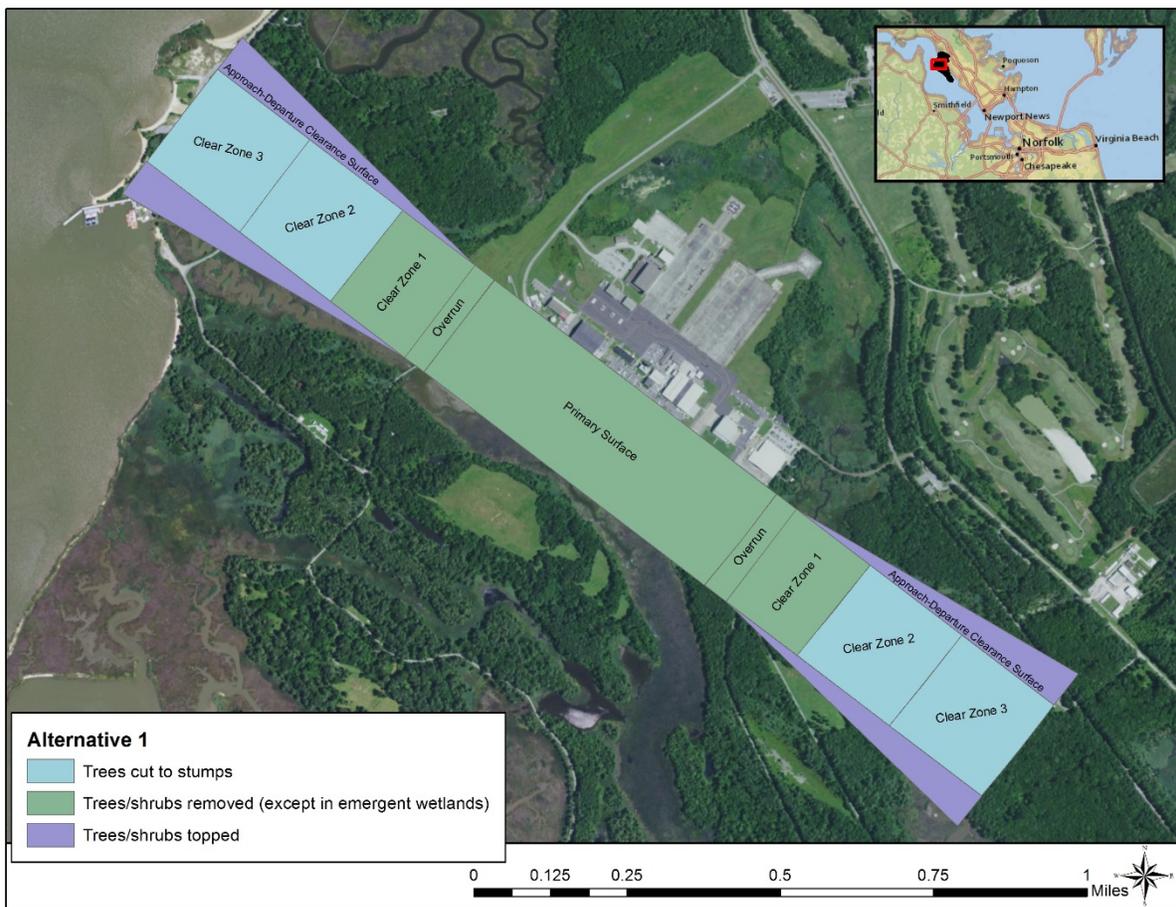


Figure 2-4. Alternative 1 tree and shrub removal, cutting, and topping areas in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area (Please note that trees would be cut to stumps in Emergent Wetlands in the Primary Surface and Clear Zone 1.)

2.4.2 Alternative 2

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Cutting to Stumps in Clear Zone 2 and Tree Topping in Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01 except in emergent wetlands (Figure 2-5). Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees would be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing would be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) following the final soil grading. Soil testing would be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach-Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01 (Figure 2-5). Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

Trees within Clear Zone 2 would be cut down to stumps as close to the ground surface as possible, leaving tree stumps no higher than eight inches (Figure 2-5). While the UFC 3-260-01 only requires tree topping in Clear Zone 2 to heights 10 feet below the Approach-Departure Clearance Surface, the additional cutting of the trees to stumps would further reduce potential tree-aircraft strike hazards.

In Clear Zone 3, trees would be topped in accordance with the UFC 3-260-01 (Figure 2-5). Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Tree removal, cutting, and topping operations would be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to prevent and mitigate any potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down, or topped

would be either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation would be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface would be maintained as herbaceous vegetation, not to exceed eight inches in height (except in emergent wetlands). Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights would be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation would continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

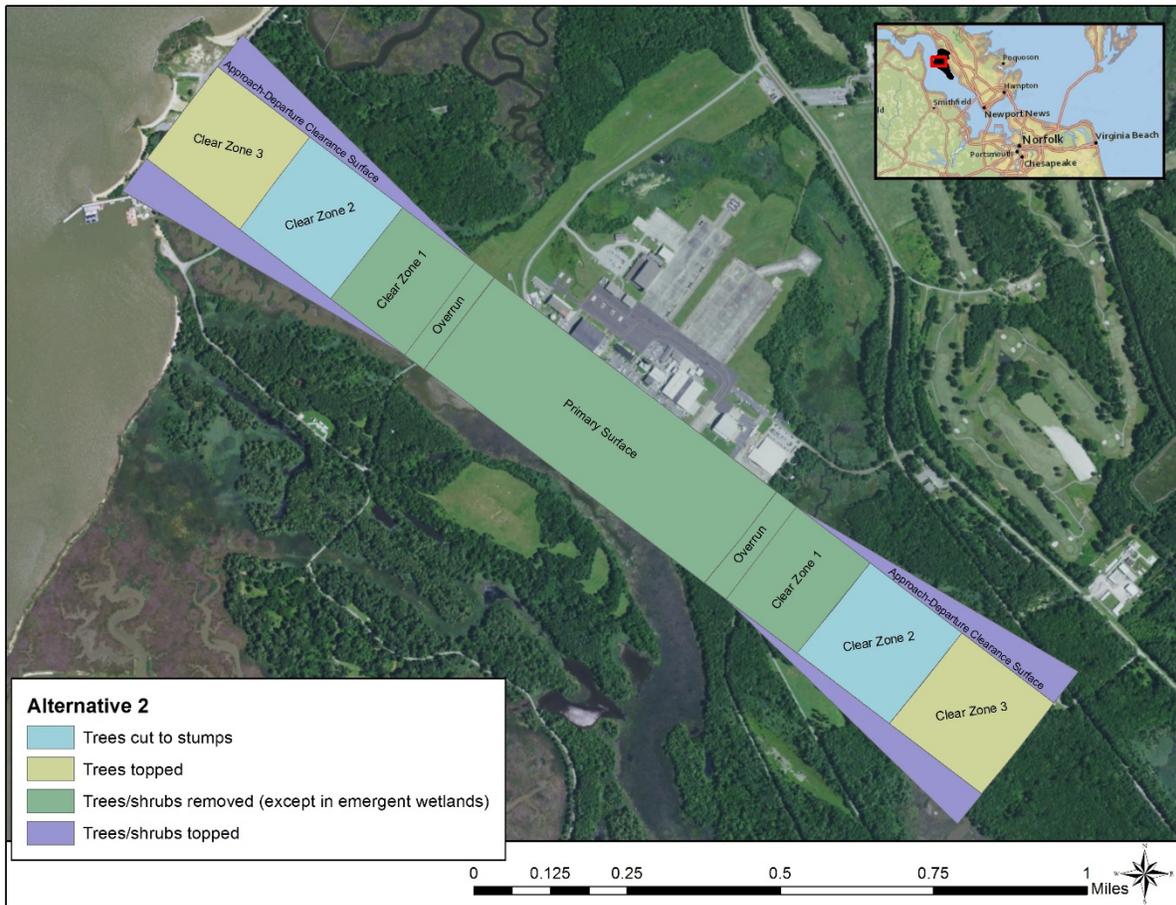


Figure 2-5. Alternative 2 tree and shrub removal, cutting, and topping areas in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area (Please note that trees would be cut to stumps in Emergent Wetlands in the Primary Surface and Clear Zone 1.)

2.4.3 Alternative 3 (Preferred Alternative)

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Topping in Clear Zone 2 and Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01, except in emergent wetlands (Figure 2-6). Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees would be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing would be done to cut down shrubs and herbaceous vegetation in all areas of the Primary

Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) within seven days of the final soil grading. Soil testing would be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01 (Figure 2-6). Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

In Clear Zone 2, trees would be topped in accordance with the UFC 3-260-01 (Figure 2-6). Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 18 feet to 43 feet in the Clear Zone 2. In Clear Zone 3, trees would also be topped in accordance with the UFC 3-260-01 (Figure 2-6). Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Vegetation management operations within the Primary Surface and the clear zones would be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down or topped would either sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation would be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface would be maintained as herbaceous vegetation, not to exceed eight inches in height, except in emergent wetlands. Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights would be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices

at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation would continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

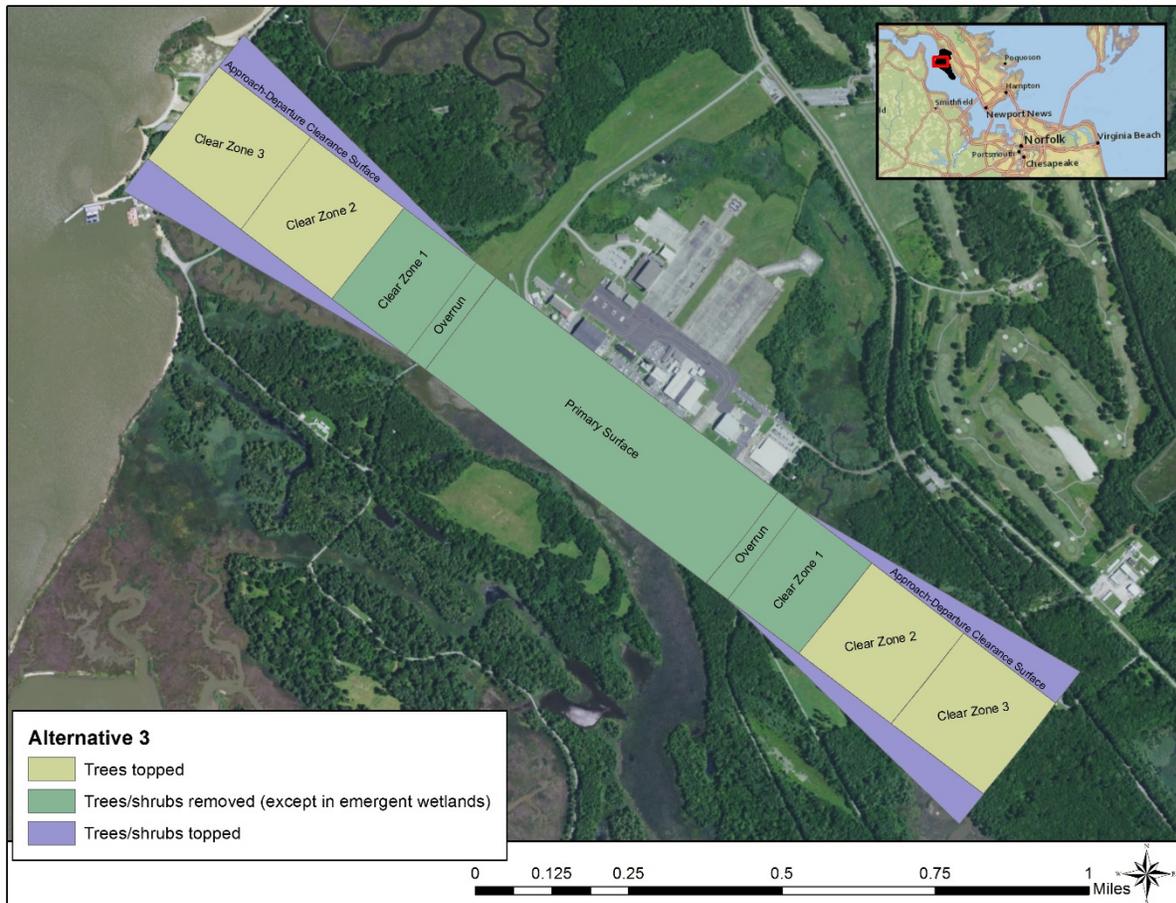


Figure 2-6. Alternative 3 Tree removal and topping areas in the Primary Surface, Clear Zone, and Approach-Departure Surface Area (Please note that trees would be cut to stumps in Emergent Wetlands in the Primary Surface and Clear Zone 1.)

2.4.4 Alternative 4

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and the Felker Army Airfield would continue to have hazardous vegetation that is not managed in accordance with the UFC 3-260-01. Under the No Action Alternative, the safety conditions would degrade further over time, as more trees continue to grow in height and expand upon their current footprint in the ROI. Grassy areas would continue to be managed in the areas adjacent to the Landing Zone in accordance with the UFC 3-260-01. Eventual closure of operations, starting with instrument approaches, and eventually cessation of fixed wing operations, could occur if a vegetation

maintenance program is not implemented or a UFC 3-260-01 waiver for all applicable areas is not obtained.

2.4.5 Alternative 5

Shortening the Runway

Under this alternative, no trees or shrubs would be impacted and the runway length would be shortened by 1,000 feet to reduce vegetation clearance issues within the modified Clear Zone 1. Each end of the runway would be reduced by 1,000 feet and this would render the runway unsuitable for fixed wing aircraft. This option would severely impact the continued flight operations that currently occur at the Felker Army Airfield. In addition, the trees flanking the runway in the Primary Surface and also the trees within the modified Clear Zone 2 and Clear Zone 3 would not be managed in accordance with the UFC 3-260-01.

2.4.6 Alternative 6

Relocation of the Airfield Operations

Under this alternative, the Felker Army Airfield operations would be relocated either onsite at another location at the JBLE–Eustis or to the nearest available Army/USAF runway located at Langley Air Force Base (AFB).

2.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA evaluates potential environmental impacts to the following resources that would likely be affected by implementation of the Proposed Action or its alternatives:

- Land Use;
- Noise;
- Air Quality;
- Water Resources;
- Safety and Occupational Health;
- Hazardous and Toxic Materials and Wastes;
- Biological Resources;
- Cultural Resources;
- Geology and Soils;
- Transportation and Circulation; and
- Aesthetics and Visual Resources.

Per NEPA, those environmental resource areas that are anticipated to experience either no or negligible environmental impact under implementation of the Proposed Action or its alternatives are not examined in detail in this EA. These environmental resources include:

- Environmental Justice;
- Socioeconomics; and
- Utilities.

A brief summary of the reasons for not undergoing detailed analyses of these resources is provided below.

Environmental Justice. With implementation of the Proposed Action, no communities (i.e., minority, low-income, or otherwise) would be disproportionately adversely impacted and no adverse impact with regard to environmental justice would result. Further, implementation of the Proposed Action would not result in increased exposure of children to environmental health risks.

Socioeconomics. The Proposed Action would not result in a change in employment or staffing levels at the JBLE–Eustis. Further, the Proposed Action would not result in a change in employment levels or regional economic activity in communities surrounding the JBLE–Eustis.

Utilities. With regard to utilities, implementation of the Proposed Action would not result in any operational impacts to the total capacity or use of utility systems present on the JBLE–Eustis or within adjacent land use areas.

2.6 SCREENING OF ALTERNATIVES, ALTERNATIVE CONSIDERED BUT ELIMINATED, AND SELECTION OF THE PREFERRED ALTERNATIVE

A basic principle of the NEPA during the planning of a federal project is to develop and evaluate reasonable project alternatives, including the No Action Alternative. Evaluating reasonable alternatives is a crucial part of the NEPA process and provides necessary information and analyses that assist the decision-maker in selecting a Preferred Alternative. In evaluating alternatives, alternatives should meet the purpose and need of the project. Alternatives must also not significantly impact the current and future missions supported by the airfield. Alternatives must also avoid and minimize negative impacts to natural and cultural resources, to the extent practicable, with unavoidable impacts mitigated to the fullest extent practicable.

An initial screening of project alternatives was done to determine how various project alternatives would impact flight-based training missions supported by the airfield that was then followed by a more detailed screening of alternatives. During the initial screening, Alternatives 5 and 6 were eliminated from further consideration as they would both cause substantive, negative impacts to flight missions currently supported by the airfield. Alternative 5, Shortening the Runway, was considered but eliminated as it would render the runway unsuitable for fixed wing aircraft.

Alternative 6, Relocation of the Airfield Operations, was an alternative that was considered but eliminated as it was determined that implementation of the alternative would substantively impact flight mission requirements for the following reasons:

- The JBLE-Eustis has no sufficient space for an airfield and airspace to occupy;
- Langley AFB has no existing facilities to support the tenant missions;
- The unique and classified nature of the RDT&E missions of the JBLE-Eustis tenants would require facilities and operations that would impede Langley AFB tenant missions, and vice versa; and
- The U.S. Navy mission supported at the Felker Army Airfield, in addition to the Felker Army Airfield tenant missions, would be an added burden to Langley AFB airspace.

Following the initial screening of alternatives, the JBLE–Eustis project team conducted a workshop and developed the following criteria to be used to evaluate and compare project alternatives:

- Ability to meet UFC 3-260-01 vegetation clearance requirements;
- Bird Aircraft Strike Hazard (BASH) Risk;
- Impact to Land-Based Training Operations;
- Environmental Impacts; and
- Cultural Resource Impacts.

The action alternatives (Alternatives 1 – 3) would all meet the UFC 3-260-01 vegetation clearance requirements in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area to the maximum extent practical; however, Alternative 1 would exceed the requirements in Clear Zones 2 and Clear Zone 3, as all trees would be cut to stumps in these areas as opposed to being topped as specified in the criteria. Likewise, Alternative 2 would exceed vegetation clearance requirements in Clear Zone 2, as trees would be cut to stumps as opposed to just being topped. The No Action Alternative (Alternative 4) currently does not meet the UFC 3-260-01 vegetation clearance requirements in the Primary Surface, Clear Zone, or Approach-Departure Clearance Surface Area.

There is an existing BASH risk that under current conditions (No Action Alternative) is approximately in the range of negligible to minor impacts that are not significant. With implementation of any of the action alternatives as compared to the No Action Alternative, BASH impacts could slightly increase in the Primary Surface and the Clear Zone because the removal of trees and shrubs would create open spaces dominated by herbaceous species that could become preferable foraging areas for geese. In addition, implementation of an action alternative would make permanent and ephemeral open water areas more visible to waterfowl and wading bird species such as herons and egrets. Because of their flight patterns and body type, geese and wading birds are more prone to hit aircraft than other species. However, the cutting of trees to stumps and topping of trees would reduce nesting and foraging habitats for a variety of avian species such as

songbirds and would be anticipated to reduce some of the existing BASH hazards. Alternative 1 may present less overall BASH hazards than Alternative 2 or Alternative 3 as dead and dying trees and topped trees may create some preferential perching sites for raptors. However, because of the mixed effects and relative uncertainty associated with prediction of BASH hazards, BASH risk was not found to be a valuable screening criteria as it was anticipated that effects for all alternatives was relatively uncertain and would likely remain in the range in the negligible to minor but not significant impacts. This is also because of the extensive mitigation measures that are currently being implemented with the BASH Prevention Program.

Within the airfield surfaces and the Clear Zone, land-based training operations, which includes navigation training, ambush training, and reconnaissance training, may be negatively impacted by implementation of any of the action alternatives. Because these training operations are affected by visibility of the terrain, these training operations would be negatively impacted by reductions in vegetation cover and vegetation height. Therefore, implementation of Alternative 1, as compared to the other action alternatives, would have the most impacts to land-based training operations as trees would be cut to stumps both within Clear Zone 2 and Clear Zone 3. Out of the action alternatives, Alternative 3 would have the least impact to land-based training operations as it would only involve topping of trees in the Clear Zone 2 and Clear Zone 3. Alternative 2 would have intermediary negative impacts to training operations as it involves cutting trees to stumps in Clear Zone 2 and topping of trees in the Clear Zone 3. The No Action Alternative would have no impacts to existing, land-based training operations.

Environmental impacts correspond to the amount of vegetation that would be removed and vegetation maintenance method. As additional tree/vegetation height is removed, it reduces the amount of wildlife habitat and overall increases the impacts to vegetation. While topping of trees and treating topped trees with integrated pesticide management practices may cause tree mortality, some may survive, and topped trees, even if they are dead, provide viable habitat to many wildlife species as opposed to trees stumps. The threatened northern long-eared bat and the endangered Indiana bat that are known to occur at JBLE–Eustis and have the potential to roost in cavities or crevices of dead and dying trees. Therefore, topping of trees would reduce potential impacts to northern-long-eared bat and Indiana bat roosting sites and as such, out of the action alternatives, Alternative 3 would have less impacts to the federally listed bat species. Overall, the No Action Alternative would not cause environmental impacts but out of the action alternatives, Alternative 3 has less environmental impacts than Alternative 1 or Alternative 2.

During the detailed screening of alternatives, potential impacts to cultural resources was considered. During the project planning, however, mitigation measures were identified that would protect the existing cultural resource site in the Clear Zone 1. Therefore, there are no anticipated adverse impacts to cultural resources with implementation of any of the action alternatives, and all of the action alternatives would have the same impact to the cultural resource site, as all of the action alternatives have tree and shrub removal in the Clear Zone 1 (except in emergent wetlands where trees would be cut to stumps) where the cultural resource of concern is located. Therefore,

impacts to cultural resources was not found to be viable screening criteria amongst the action alternatives.

Based on evaluation of the initial and detailed screening, the criteria that best discerned the alternatives were impacts to flight missions and land-based training operations as well as environmental impacts. While the No Action Alternative would have the least amount of impacts to land-based training operations and natural resources, it does not meet the purpose of need of the project. Alternative 3 was selected as the Preferred Alternative as it adequately meets the purpose and need of the project while minimizing impacts to natural resources and land-based training operations as compared to the other action alternatives.

3 AFFECTED ENVIRONMENT

This section describes relevant existing environmental conditions within the Region of Influence (ROI; geographic area where any of the alternatives could potentially have an affect) as it pertains to individual resources. This information will be used to identify the anticipated environmental impacts associated with implementation of the Proposed Action (see Section 4, *Environmental Consequences*).

Per guidelines established by the NEPA, CEQ regulations, Title 32, CFR Part 989 (32 CFR 989), *Environmental Impact Analysis Process* (EIAP), and the Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*, the description of the affected environments and the associated impact analyses in this EA focus on those aspects of the environment potentially subject to impacts resulting from attaining and maintaining vegetation airfield clearances that would occur with implementation of the Proposed Action. Section 2.5, *Scope of the Environmental Assessment*, provides an explanation and a summary of resource areas eliminated from detailed analysis.

This EA addresses the environmental conditions and impact analyses for the following environmental resources that would likely be affected by the implementation of the Proposed Action or its alternatives at JBLE–Eustis:

- Land Use;
- Noise;
- Air Quality;
- Water Resources;
- Safety and Occupational Health;
- Hazardous and Toxic Materials and Wastes;
- Biological Resources;
- Cultural Resources;
- Geology and Soils;
- Transportation and Circulation; and
- Aesthetics and Visual Resources.

3.1 LAND USE

3.1.1 Definition of Resource

Land use generally refers to human modification of land, often for residential or economic purposes. It also refers to the use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features. Human land use includes residential, commercial, industrial, agricultural, and recreational uses, while unique natural features are often designated as national parks, national forests, wilderness areas, or national wildlife refuges. Attributes of land use include general land use and ownership, land management plans, and special

use areas. Land ownership is a categorization of land according to type of owner. The major land ownership categories include federal, Native American, state, and private.

Federal lands are further described by the managing agency, which may include the USFWS, U.S. Forest Service, or DoD. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of allowable activities or protect specially designated or environmentally sensitive uses. Special Use Land Management Areas are identified by agencies as being worthy of more rigorous management.

The ROI for Land Use consists of the Felker Army Airfield and surrounding areas, including the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface Area located adjacent to the Clear Zone.

3.1.2 Existing Conditions

Land use within the ROI is dominated by the training needs of the military personnel at JBLE-Eustis. Dominant land use within the ROI is the airfield operations and adjacent land military training operations. The area north of the airfield is developed, containing administrative buildings and supporting features for the airfield. Figure 3-1 and Table 3-1 define the existing training activities that occur within the ROI.

Most training areas remain in a relatively natural state, though they are managed by Integrated Training Area Management for military training purposes and by JBLE-Eustis wildlife biologists and foresters for fish and wildlife needs, recreational hunting, and limited commercial timber production.

Table 3-1. Training activities in the Region of Influence

| Training Area | Description of Training Activities |
|---------------|--|
| TA18 | bivouac (camping) and tactical bivouac, boat and dive operations, cargo yard operations, commo exercise, convoy exercise, digging (bull dozers, bucket loader), field training exercise, marshalling yard training, reconnaissance, small boat ops and training, tactical/commercial driving, water operations |
| TA19 | tactical bivouac, Commo exercise, convoy exercise, land navigation intermediate, land navigation training, reconnaissance, tactical road march |
| TA20 | bivouac (camping) and tactical bivouac, boat and dive operations, cargo yard operations, commo exercise, convoy exercise, digging (bull dozers, bucket loader), field training exercise, marshalling yard training, reconnaissance, small boat ops and training, tactical/commercial driving, water operations |
| TA21 | ambush training, bivouac and tactical bivouac, convoy exercise, convoy reaction course, driver training, helicopter operations, land navigation intermediate, land navigation training, reconnaissance, road march, slingload training, tactical/commercial vehicle driving |
| TA22 | land navigation advanced, land navigation basic, reconnaissance, tactical bivouac |
| TA24 | land navigation advanced, land navigation basic, land navigation intermediate, reconnaissance, tactical bivouac |
| TA28 | Ambush training, bivouac and tactical bivouac, CLFX, commo exercise, convoy exercise, convoy reaction course, deliberate hasty attack, drivers training, helicopter operations, land navigation intermediate, land navigation training, road march, slingload training, small unit training, squad defense training, tactical/commercial vehicle driving |

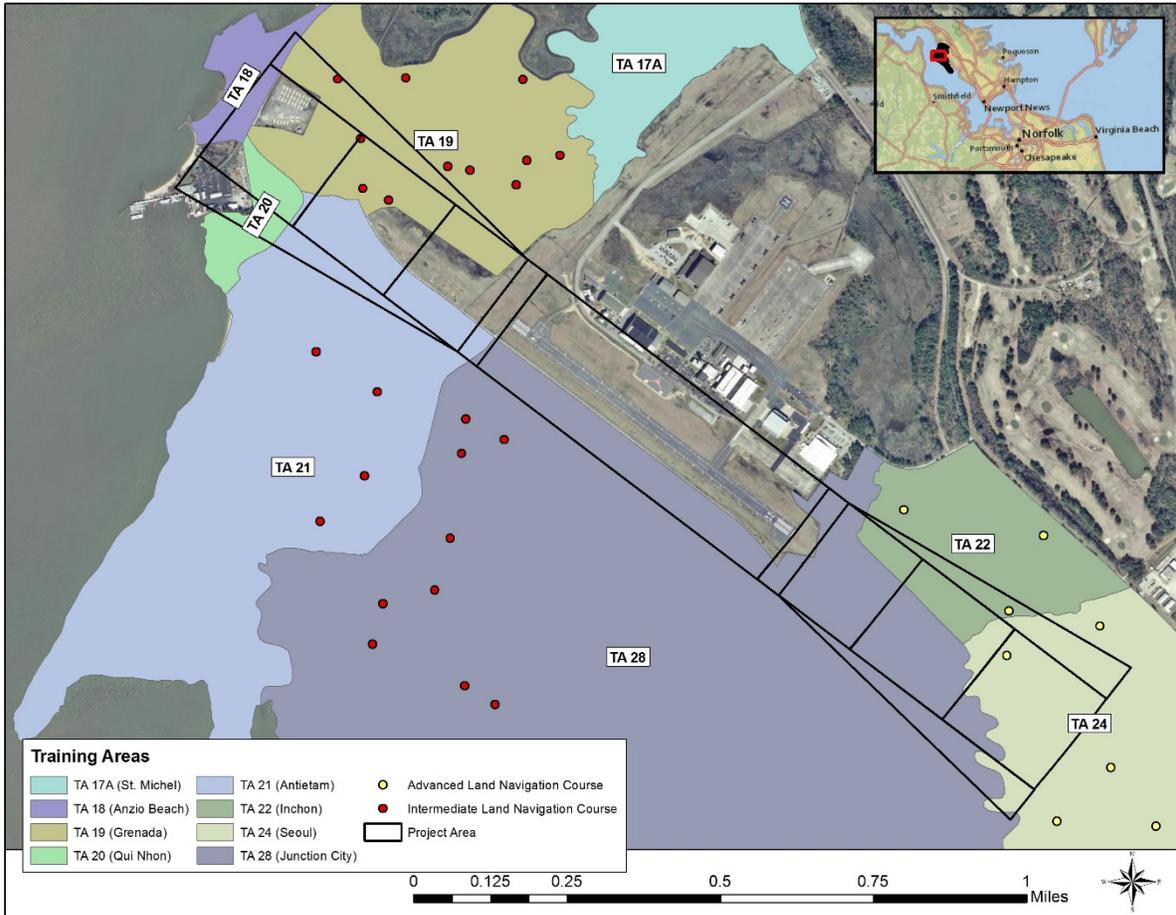


Figure 3-1. Training areas in the Region of Influence

3.2 NOISE

3.2.1 Definition of Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or otherwise results in an adverse human response. Actual response to noise can vary according to the type and characteristics of the noise source, distance between the noise source and receptor, sensitivity of the receptor, and time of day. Sensitive noise receptors are identified facilities or land uses that would be most sensitive to the effects of noise, such as residences, schools, patient care facilities, and child care centers.

The unit used to measure the loudness of noise is the decibel (dB). The majority of community noise standards utilize A-weighted decibels (dBA) as the measure of noise, as it provides a high degree of correlation with human annoyance and health effects. A-weighting a sound de-emphasizes the very low and very high frequencies of sound in a manner similar to the functioning of the human ear. Day night sound level (DNL) is a noise metric that averages A-weighted sound

levels over a 24-hour period, with an additional 10-dB penalty added to the noise events occurring between 10:00 PM and 7:00 AM. This penalty is intended to compensate for generally lower background noise levels at night and the additional annoyance of nighttime noise events.

The Noise Control Act of 1972 directs federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. In 1974, the U.S. Environmental Protection Agency (USEPA) provided information suggesting that continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. Virginia has no statewide noise regulation. The City of Newport News maintains a general nuisance noise ordinance. The code, however, does not set explicit not-to-exceed sound levels. Construction noise, including the clearing or excavation of property and related activities, is exempt from the ordinance weekdays between the hours of 7:00 a.m. and 8:00 p.m. (Newport News Municipal Code Chapter 26.1, Section 5).

The ROI for Noise extends approximately 1,000 feet from the boundaries of the limits of the Primary Surface and the Approach-Departure Clearance Surface Areas adjacent to the Clear Zone.

3.2.2 Existing Conditions

3.2.2.1 Land Use Guidelines

In June 1980, The Federal Interagency Committee on Urban Noise (FICUN) published guidelines (FICUN 1980) relating DNL values to compatible land uses. Since their issuance, federal agencies have generally adopted their guidelines for noise analysis. Land use categories most sensitive to ambient noise are residential, institutional, cultural, and some recreational uses. Industrial land uses are the least sensitive to surrounding noise, largely due to the inherently high levels of ambient noise associated with industrial activities.

3.2.2.2 Joint Base Langley Eustis-Fort Eustis and Noise Sensitive Receptors

Flight and land training operations are the dominant source of noise generation within the ROI. The estimated DNL within the ROI is 65 dBA, which is primarily due to aircraft operations from Felker Army Airfield (U.S. Army Center for Health Promotion and Preventative Medicine 2007). Other sources of noise near the proposed site include: distant road traffic, high altitude aircraft overflights, watercraft, and natural noises such as leaves rustling and bird vocalizations. There are no nearby freeways or rail corridors. There are no residences, schools, churches, or hospitals within the ROI.

3.3 AIR QUALITY

3.3.1 Definition of Resource

Air quality is affected by stationary sources (e.g. industrial development), mobile sources (e.g., motor vehicles), and area sources (e.g., dry cleaners, gas stations, and auto body paint shops). Air quality at a given location is a function of several factors including the quantity and type of pollutants emitted locally and regionally, as well as the dispersion rates of pollutants in the region. Primary factors affecting pollutant dispersal include wind speed and direction, atmospheric stability, temperature, the presence of inversions, and topography.

The project's ROI for air quality is the USEPA's regulatory boundary of the Hampton Roads Area that contains the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg, and the counties of Gloucester, Isle of Wight, James City, and York, Virginia.

3.3.1.1 Criteria Pollutants

The USEPA Region 3 and the VDEQ regulate air quality in Virginia. The Clean Air Act (CAA) (42 USC 7401-7671), as amended, gives the USEPA the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that set acceptable concentration levels for six criteria pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter equal to or less than 10 micrometers in aerodynamic diameter (PM₁₀) and 2.5 micrometers in aerodynamic diameter (PM_{2.5}) and lead. The NAAQS represent maximum levels of background pollution considered safe for public health and the environment, with an adequate margin of safety.

Federal regulations designate regions in violation of the NAAQS as nonattainment areas. Federal regulations designate regions with levels below the NAAQS as attainment areas. Maintenance regions are areas that have previously been designated nonattainment and have been re-designated to attainment for a probationary period through the implementation of maintenance plans.

3.3.1.2 Greenhouse Gases and Climate Change

Global climate change is a transformation in the average weather of the Earth, which is measured by changes in temperature, wind patterns, and precipitation. Emission of greenhouse gases above natural levels is suggested to be a significant contributor to global climate change. Greenhouse gases are known to trap heat in the atmosphere and regulate the Earth's temperature. These gases include water vapor, carbon dioxide, methane, nitrous oxide, ground-level ozone, and fluorinated gases such as chlorofluorocarbons, and hydrochlorofluorocarbons.

The Earth's average temperature has increased by more than one degree Fahrenheit over the last century and many scientists, but not all, have attributed this temperature rise to the burning of fossil fuels and the resulting release of carbon dioxide into the atmosphere (Intergovernmental

Panel on Climate Change 2013, referenced in Strauss et al. 2014). Global sea level rise has resulted from this warming with a cascading effect of melting glaciers and ice sheets. Scientists estimate sea level has risen approximately two times faster in the last two decades as compared to the 20th century (Strauss et al. 2014). Along the east coast, coastal flooding is anticipated to increase with sea level rise, as higher sea level increases the potential for more severe storm surge.

Climate change and related sea level rise is anticipated to be accelerated along the eastern coastal portions of the United States. A recent sea level rise study for Virginia predicts that record-breaking coastal flooding is likely to occur under mid-to-high range projections within the next 20 to 30 years (depending on location within Virginia) (Strauss et al. 2014). Using scenarios from a National Oceanic and Atmospheric Administration-led technical report to the National Climate Assessment (Parris et al. 2012, referenced in Strauss et al. 2014), the Strauss et al. (2014) study estimated mid-range or “intermediate high” local sea level rise projections for different locations in Virginia of roughly 1.2-1.5 feet by mid-century, and 4.0 to 4.8 feet by 2100 (using 2012 as the baseline).

Executive Order 13693, Planning for Federal Sustainability in the Next Decade, was signed on March 19, 2015 and directs federal agencies with sustainability mandates that promote energy conservation, efficiency, and management. This EO will help to maintain federal leadership in sustainability practices and reduce greenhouse gas emissions.

3.3.2 Existing Conditions

3.3.2.1 Climate

The JBLE–Eustis is located within the City of Newport News that is characterized by a humid, subtropical climate with hot summers and mild to cool winters (Weatherbase 2017). The average annual temperature in Newport News is 60.6° Fahrenheit and ranges from an average high of 90° Fahrenheit in July to an average low temperature of 49° Fahrenheit in January (U.S. Climate Data 2017). Mean average annual rainfall is 45.47 inches and ranges from an average high of 5.35 inches in August to an average low of 2.99 inches in February (U.S. Climate Data 2017). Precipitation peaks during the summer in July and August but is relatively evenly distributed throughout the year (U.S. Climate Data 2017).

3.3.2.2 Local Air Quality

Under the CAA, a geographic area with air quality that is cleaner than the primary ambient air quality standard is an *attainment* area; areas that do not meet the primary standard are *nonattainment* areas. *Maintenance* areas include areas previously classified as nonattainment, but are now in compliance with the NAAQS as a result of implementation of the state air quality management plan.

The Commonwealth of Virginia maintains a network of air monitoring stations throughout Virginia and the ROI falls within the Air Quality Control Region 6 as defined in 9 VAC 5-20-200

as the Hampton Roads Intrastate Air Quality Control Region (VDEQ 2015). Air quality in the region has improved significantly in the last 15 years. Air quality trends since 2004 for all criteria pollutants indicate that ambient concentrations for all criteria pollutants are declining (VDEQ 2015). The Hampton Roads area is currently designated as an attainment area for all NAAQS criteria pollutants. Table 3-2 presents the most recent, 2015 baseline emissions inventory for criteria pollutants (excluding ozone) in the City of Newport News (excluding the JBLE–Eustis).

Table 3-2. Baseline Emissions Inventory for Newport News, Virginia (Virginia Department of Environmental Quality 2015)

| Carbon Dioxide (tpy) | Nitrogen Oxides (tpy) | Sulfur Dioxide (tpy) | Volatile Organic Compounds (tpy) | PM₁₀ (tpy) | PM_{2.5} (tpy) |
|-----------------------------|------------------------------|-----------------------------|---|------------------------------|-------------------------------|
| 177.57 | 290.08 | 515.35 | 403.53 | 71.70 | 9.27 |

PM₁₀ = particulate matter equal to or less than 10 micrometers in aerodynamic diameter; PM_{2.5} = particulate matter equal to or less than 2.5 micrometers in aerodynamic diameter; tpy = tons per year

The VDEQ (re)issued JBLE-Eustis a Minor, Stationary Source Permit to Operate in August 2006. Existing stationary sources at the installation include: boilers, helicopter engine testing, marine engine testing, generators, a fuel pumping station, landfills, storage tanks, woodworking shops, paint booths, and abrasive bead blasting. New stationary sources of emissions, such as emergency generators or boilers, would have to be reviewed to determine if a permit modification would be required. In addition, existing mobile and area sources of emissions at the installation include on- and non-road vehicles, rotorcraft, and fixed-wing aircraft. Table 3-3 presents the 2015 emissions inventory for criteria pollutants (excluding ozone) for the JBLE-Eustis.

Table 3-3. Criteria Pollutant Emissions Inventory at Joint Base Langley Eustis-Fort Eustis (Virginia Department of Environmental Quality 2015)

| Carbon Dioxide (tpy) | Nitrogen Oxides (tpy) | Sulfur Dioxide (tpy) | Volatile Organic Compounds (tpy) | PM₁₀ (tpy) | PM_{2.5} (tpy) |
|-----------------------------|------------------------------|-----------------------------|---|------------------------------|-------------------------------|
| 13.47 | 21.38 | 0.13 | 6.92 | 2.05 | 1.33 |

PM₁₀ = particulate matter equal to or less than 10 micrometers in aerodynamic diameter; PM_{2.5} = particulate matter equal to or less than 2.5 micrometers in aerodynamic diameter; tpy = tons per year

3.4 WATER RESOURCES

3.4.1 Definition of Resource

Water resources analyzed in this EA include surface water, groundwater, and floodplains. Natural surface water resources include tidal and non-tidal sources. Groundwater can be defined as subsurface water resources that are interlaid in layers of rock and soil and recharged by surface water seepage. Other issues relevant to water resources include watershed areas affected by existing and potential hazards related to floodplains. Additionally, this EA includes analysis of coastal resources for consistency with the CZMA.

The ROI for Water Resources consists of the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area adjacent to the Clear Zone and influencing surface waterbody and groundwater sources to these areas.

3.4.2 Existing Conditions

3.4.2.1 Surface Water

Several surface water bodies, along with associated tributaries, exist adjacent to the Felker Army Airfield. These water bodies include Fort Creek, Morleys Gut, Morrison Creek, Blows Creek, the Warwick River and the James River. Other surface waters associated with JBLE-Eustis include Skiffe's Creek, Eustis Lake, Milstead Island Creek, Butlers Gut, Bailey Creek, Browns Lake, and the Warwick River. Because of the predominance of wetlands in the ROI, standing surface water is typical throughout many of the wetland areas.

The VDEQ released the Final 2014 305(b)/303(d) Water Quality Assessment Integrated Report (Integrated Report) on June 13, 2016 that summarizes the water quality conditions in Virginia from January 1, 2007, through December 31, 2012.

Water quality standards designate uses for waters. If a water body does not meet the water quality standards, it will not support one or more of its designated uses. Such waters have "impaired" water quality. Typically, a cleanup plan, a Total Maximum Daily Load, must be developed and implemented to restore impaired waters.

The waters of the James and Warwick Rivers do not meet federal/state water quality standards per the 2014 Virginia Water Quality Assessment (Table 3-4). Total maximum daily loads have been established for some of the parameters causing impairment within these rivers.

**Table 3-4. Water Quality Impairments within the James River and Warwick River
(Virginia Department of Environmental Quality 2014)**

| Water body and Affected Boundary & Cause Code | Impairment | Category | Cause |
|--|--|-----------------|--|
| James River CBP Segment-JMSMH JMSMH-DO-BAY | Aquatic Life Open Water Aquatic Life | 4A/4D 4A/4D | Dissolved Oxygen |
| James River CBP Segment-JMSMH JMSMH-SAV-BAY | Aquatic Life Shallow Water SAV | 4A | Aquatic Plants (Macrophytes) |
| James River - Lower G10E-04-CHLA | Aquatic Life Open Water/Aquatic Life | 4A 4A | Chlorophyll a |
| James River and various tributaries (Julian Creek) Bailey Creek G01E-03-PCB | Fish Consumption | 5 | Polychlorinated biphenyls in Fish Tissue |
| James River G01E-01-BAC | Recreation | 4A | <i>Escherichia coli</i> |
| James River G03E-01-PH | Aquatic Life | 5A | pH |
| James River G03E-01-PCB | Fish Consumption | 5A | Polychlorinated Biphenyls in Water Column |
| Bailey Creek G03R-02-BAC | Recreation | 4A | <i>Escherichia coli</i> |
| Bailey Creek G03E-01-BAC | Recreation | 4A | <i>Escherichia coli</i> |
| Warwick River – Middle Tidal Portion G11E-01-BAC | Recreation | 4A | <i>Enterococcus</i> |

3.4.2.2 Water Quality

The VDEQ defines surface water quality standards that protect designated uses of surface waters in Virginia. Water quality standards consist of three components: use designations, general criteria, and numeric water quality criteria necessary to protect those uses. All streams in Virginia, including those flowing through JBLE-Eustis, are minimally assigned the following uses: recreation (e.g., swimming, boating); propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them; wildlife; and the production of edible and marketable natural resources (e.g., fish and shellfish).

Water quality studies were conducted as part of Installation Restoration Program (IRP) studies, and Remedial Investigation Reports exist for Eustis Lake from 2003, Browns Lake from 1997, and Bailey Creek from 1997. However, none of these water bodies are located in the ROI.

3.4.2.3 Groundwater

The groundwater at JBLE-Eustis is supported by a system of seven aquifers separated by intervening semi-confining units. The uppermost aquifer at JBLE-Eustis is unconfined and is approximately 10-15 feet thick. Being unconfined, groundwater from this aquifer discharges into streams, rivers, and lakes. The upper part of the aquifer comprises the surface of the water table. Recharge of the aquifer is through infiltration of precipitation. Groundwater wells at JBLE-Eustis are used solely for non-potable water supply. Groundwater on the installation is pumped from eight wells at depths of over 400 feet and is mainly used to fill ponds and to irrigate the golf course. Potable water to the JBLE-Eustis is supplied by the City of Newport News Lee Hall Water Filtration Plant.

3.4.2.4 Floodplains

Floodplains are generally areas of low level ground present on one or both sides of a stream channel that are subject to periodic or infrequent inundation by flood waters. Floodplains are typically the result of lateral erosion and deposition that occurs as a river valley is widened. The porous material that comprises the floodplain is conducive to retaining water that enters the soil during flooding events and at times when the groundwater table is elevated. Floodplains in their natural form are beneficial in reducing the number and severity of floods, minimizing non-point source water pollution, filtering stormwater, providing habitat for plants and animals, and providing aesthetic appeal and outdoor recreation benefits. Inundation dangers associated with development of floodplains have prompted federal, state, and local legislation to limit floodplain development to recreation, agriculture, and preservation activities. Executive Order 11988, *Floodplain Management*, requires federal agencies to protect the values and benefits of floodplains and to reduce risks of flood losses by not conducting or allowing activities within floodplains, unless there is no practical alternative.

The ROI for floodplains consists of the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone.

Flood hazard areas are identified by the Federal Emergency Management Agency (FEMA) on the Flood Insurance Rate Map as a Special Flood Hazard Area. The Special Flood Hazard Areas are those areas flooded that have a one-percent chance of being equaled or exceeded in any given year. The one-percent annual chance flood is also commonly referred to as the base flood or 100-year flood. The Special Flood Hazard Areas are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, Zone B or Zone X are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.

Minimal flood hazard areas, which are the areas outside the Special Flood Hazard Areas and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

The ROI occurs in a low-lying area with most elevations defined on the Flood Insurance Rate Map ranging from approximately seven to nine feet (FEMA 2014). Generally, portions of the runway and some of the areas adjacent to the runway are located within the FEMA designated 500-year floodplain (Figure 3-2). However, the majority of the ROI is located within the FEMA designated 100-year floodplain designated as Zone AE (Figure 3-2). Generally, only a few areas (unshaded areas) at the runway or adjacent to the runway are located outside of the 100-year or 500-year floodplain (Figure 3-2).

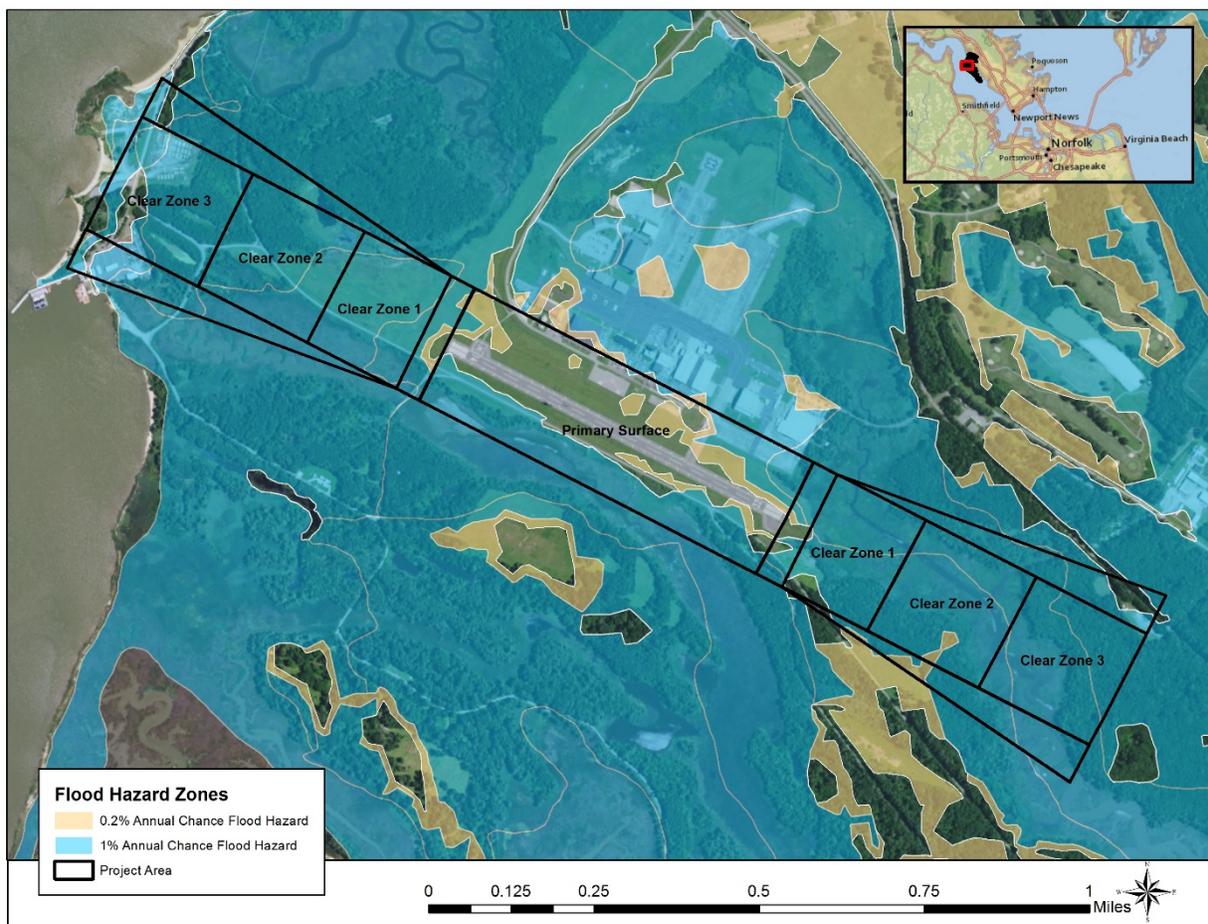


Figure 3-2. Flood Hazard Zones at the Region of Influence and surrounding areas (Federal Emergency Management Agency 2014)

3.4.2.5 Coastal Zone Management Act Consistency

In 1972, the U.S. Congress enacted the CZMA (16 USC 1451-1464) to assist the coastal states, Great Lake states, and the U.S. territories to develop coastal management programs, and comprehensively manage and balance competing uses of and impacts to coastal resources. The Virginia Coastal Zone Management Program was established via an EO in 1986 and consists of a network of state agencies and local governments that administer enforceable laws, regulations, and policies that protect coastal resources and ensures sustainable development. Any federal action that has the potential to impact Virginia's coastal resources is reviewed for consistency with the CZMA.

The Chesapeake Bay Preservation Act (CBPA) is one of the enforceable policies of the CZMA. The JBLE-Eustis also follows, to the maximum extent practicable, the City of Newport News Chesapeake Bay Preservation Ordinance (CBPO), which was enacted pursuant to the CBPA, Sections 10.1-2100, et seq., of the Code of Virginia (VAC). Article V, Section 37.1-46 of the City of Newport News Code defines Chesapeake Bay Preservation Areas to include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). The RPA includes tidal waters and wetlands, perennial streams, contiguous wetlands, plus a 100-foot buffer to these "core" components. The RMA includes all lands within 100 feet landward of the landward boundary of the RPA, plus all lands containing slopes greater than 15 percent, highly erodible soils, and the 100-year floodplain. In accordance with the CPBO, the development of RPAs is restricted to water dependent activities, maintenance of public activities, passive recreation, water wells, and historic preservation. Removal of trees within the RPA is also strongly discouraged; as a result, the JBLE-Eustis maintains a vegetated RPA to the extent practical.

While the entire City of Newport News, including the JBLE-Eustis, is designated as a managed coastal zone that is subject to the provisions of the CZMA, we are defining the ROI within the JBLE-Eustis as the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area as impacts to the coastal zone will not occur outside of these areas for this project.

Based on the results of wetland jurisdictional determination of wetlands conducted by the USACE in May 2015, the RPA 100 foot buffer was re-delineated in ArcMap 10.3.1. As depicted in Figure 3-5, much of the ROI (approximately 174.24 acres) is located in the RPA.

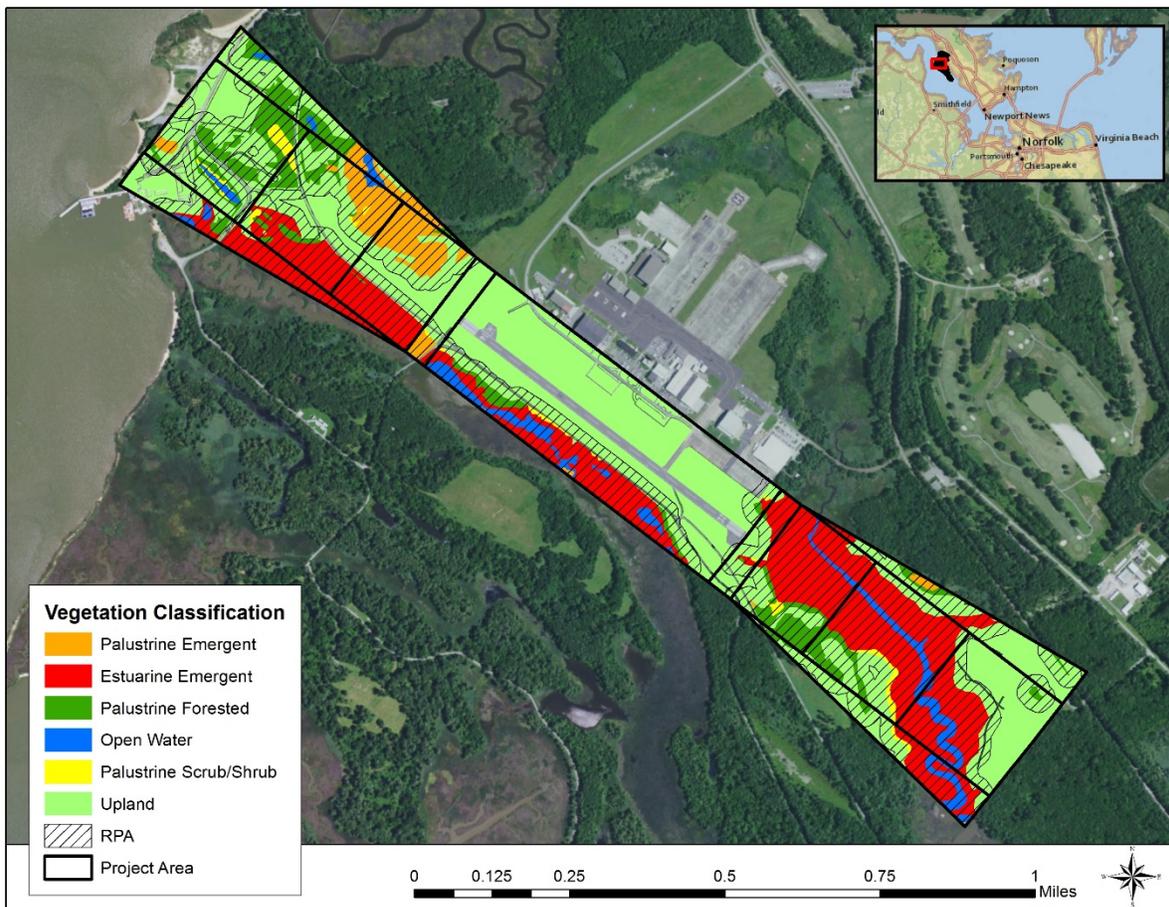


Figure 3-3. Resource Protection Areas in the Region of Influence

3.5 SAFETY AND OCCUPATIONAL HEALTH

3.5.1 Definition of Resource

The primary safety concern of facilities with aircraft operations is the potential for aircraft mishaps (i.e. crashes), which may be caused by mid-air collisions with other aircraft or objects, weather difficulties, pilot error, equipment malfunctions, or bird/wildlife-aircraft strikes. The USAF has defined aircraft mishap classifications based upon personal injury and property damage. These mishap classifications range from Class A (i.e., total cost in excess of \$2 million or more, fatality, or permanent disability, destruction of DoD aircraft) to Class D (i.e., total cost to \$20,000 or more but less than \$50,000). Bird Aircraft Strike Hazard (BASH) is defined as the threat of aircraft collision with birds and other wildlife during aircraft operations.

Airfield clearances for DoD facilities is described in the UFC 3-260-01 and USAF regulates airfield clearances under Air Force Manual 32-1123, *Airfield and Heliport Planning Criteria*. Accident Potential Zones are rectangular zones extending outward from the ends of active runways

at military bases, which delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during takeoff or landing. Clear Zones are the areas closest to the end of a runway, which are considered the most hazardous areas.

3.5.2 Existing Conditions

3.5.2.1 Bird Aircraft Strike Hazards and Other Wildlife Hazards

Bird Aircraft Strike Hazard is a safety concern at all airfields due to the frequency of aircraft operations and the possibility of encountering birds at virtually all altitudes and of encountering wildlife on the airway surfaces. Because migratory bird species are considered of special ecological value, EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, was introduced in 2001 to ensure that federal agencies focus attention on the environmental effects to migratory bird species, and where feasible, implement policies and programs that support the conservation and protection of migratory birds. The JBLE-Eustis is located within the Atlantic Migratory Flyway.

The U.S. Department of Agriculture completed a wildlife hazard assessment at the Felker Army Airfield in 2013 (Olexa and James 2013). The results of the wildlife hazard assessment were used to develop a site-specific BASH Plan (Department of the Army 2004) for the Felker Army Airfield. The 1st Fighter Wing and Airfield Management Operations at the JBLE-Eustis implement the adaptive BASH Prevention Program at the Felker Army Airfield. The program is directed by the Air Force Mishap Prevention Program 91-202 and the JBLE-Eustis BASH Plan. The purpose of the program is to reduce dangerous and costly wildlife strikes by reducing hazards near the aircraft operating area. The U.S. Department of Agriculture Wildlife Services Program has conducted a BASH Prevention Program at the Felker Army Airfield since January of 2015. The program includes conducting bird and wildlife surveys in the vicinity of the airfield and implementing measures to reduce BASH risks as described in the BASH Plan. The JBLE-Eustis BASH Plan addresses measures that must be followed when bird-strike conditions are deemed moderate to severe. Since 2015, the U.S. Department of Agriculture has conducted wildlife management with lethal and non-lethal techniques during 512 events that have managed 7,283 wildlife individuals (Priestly 2016). A summary of the 2015-2016 program findings along with reported bird/wildlife strikes is provided in Table 3-5.

Based on the data collected in Fiscal Year 2016, 15 bird guilds were observed and three mammal groups were identified as potential BASH hazards in the vicinity of the Felker Army Airfield. Deer are ranked as the highest BASH hazard at the Felker Army Airfield and were present in nearly all of the Fiscal Year 2016 surveys (Priestly 2016). Using the wildlife hazard rankings of Dolbeer and Wright (2009), the following seven bird groups were identified at the airfield that have the highest potential risk for causing a damaging strike (Priestly 2016):

- Raptors;
- Waterfowl;

- Blackbirds;
- Corvids (crows and jays); and
- Pelicans and Cormorants (Double-crested cormorants).

Historical data (collected from 1994-2016) indicates 1.7 reported strikes per year at the Felker Army Airfield (Priestly 2017). This historical data indicates most strikes at the Felker Army Airfield have occurred in August, October, and April and may be attributed to juvenile birds fledging and potentially spring and fall migration periods (Priestly 2016). In 2016, peak bird observations occurred during the fall and winter with daily observations highest at dawn. Since January 2015, 7,283 wildlife were dispersed or removed during 512 management events (Priestly 2017).

The following wildlife management permits are maintained for implementation of the program:

- USFWS Migratory Bird Depredation Permit that authorized the take of migratory bird species identified as hazardous to aircraft, excluding threatened and endangered species.
- USFWS Bald Eagle Harassment Permit that authorizes the use of non-lethal scare devices and tactics to move or disperse bald eagles (*Haliaeetus leucocephalus*) within one mile of the Aircraft Operating Area that pose a threat of a serious bird strike to aircraft, and to remove eagle nests located within one mile of the Aircraft Operating Area.

Reported BASH incidents at the JBLE-Eustis from 1994-2012 and from 2015-2016 are provided in Table 3-5 below.

Table 3-5. Reported Bird Aircraft Strike Incidents at the Joint Base Langley Eustis-Fort Eustis Fiscal Year 1994-2012, 2015-2016 (Priestly 2017; Priestly 2016; Olexa and James 2013)

| Year | Number of Strikes/Aircraft | Species Reportedly Involved | Management Events/Number of Wildlife Individuals Dispersed | Number of Eagle Nests Removed/ |
|-------------|-----------------------------------|--|---|---------------------------------------|
| 2016 | 1 /FCD Bell Helicopter; 2 /MH-60s | Osprey (<i>Pandion haliaetus</i>) | 512/7,283 | 2 |
| 2015 | 1/MH-53E | Osprey | 512/7283 | 1 |
| 2012 | MH060S | Shorebird | N/A | N/A |
| 2012 | MH060S | Unknown | N/A | N/A |
| 2011 | Unknown | Mourning Dove (<i>Zenaida macroura</i>) | N/A | N/A |
| 2011 | MH053E | Cooper's hawk (<i>Accipiter cooperii</i>) | N/A | N/A |
| 2011 | UH60S | Rock dove (<i>Columba livia</i>) | N/A | N/A |
| 2011 | MH060S | Unknown | N/A | N/A |
| 2011 | MH060S | Unknown | N/A | N/A |
| 2010 | MH060S | Unknown | N/A | N/A |
| 2010 | MH060S | Unknown small bird | N/A | N/A |
| 2008 | H53 | Unknown hawk | N/A | N/A |
| 2008 | MH060S | Unknown | N/A | N/A |
| 2007 | MH060S | Unknown | N/A | N/A |

| Year | Number of Strikes/Aircraft | Species Reportedly Involved | Management Events/Number of Wildlife Individuals Dispersed | Number of Eagle Nests Removed/ |
|------|----------------------------|--|--|--------------------------------|
| 2007 | MH060S | Unknown | N/A | N/A |
| 2006 | MH060S | Unknown bat | N/A | N/A |
| 2004 | UH-60 | Unknown | N/A | N/A |
| 2004 | MH060S | Unknown | N/A | N/A |
| 2004 | HC060 | Unknown | N/A | N/A |
| 2004 | HC-8 | Northern pintail (<i>Anas acuta</i>) | N/A | N/A |
| 2004 | CH47D | Unknown waterfowl | N/A | N/A |
| 2003 | HH060 | Unknown | N/A | N/A |
| 2003 | H046 | Unknown | N/A | N/A |
| 2003 | MH053D | Unknown | N/A | N/A |
| 2003 | Unknown | Canada goose (<i>Branta canadensis</i>) | N/A | N/A |
| 2003 | CH47D | Unknown | N/A | N/A |
| 1994 | C21 | Unknown | N/A | N/A |

N/A=Not Applicable

3.6 HAZARDOUS AND TOXIC MATERIALS AND WASTES

3.6.1 Definition of Resource

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA), as amended, as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that pose a substantial present or potential hazard to human health or to the environment. Hazardous materials are defined by the Comprehensive Environmental Response, Compensation,

and Liability Act (CERCLA), as amended, as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious reversible illness, or incapacitating reversible illness; or pose a substantial threat to human health or the environment. Issues associated with hazardous materials and wastes typically center on underground storage tanks; aboveground storage tanks; and the storage, transport, and use of pesticides, fuels, and other petroleum-based products, lubricants, antifreeze, and paint solvents. When such resources are improperly used in any way, they can threaten the health and well-being of wildlife species, vegetation communities, soil systems, water resources, and people.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, USAF, through AFI 10-2510 and 32-7086, has dictated that all facilities develop and implement Hazardous Materials Management Plans, Hazardous Waste Management Plans, and/or Spill Prevention, Control, and Countermeasure Plans. In addition, the DoD has developed the Environmental Restoration Program to facilitate thorough investigation and cleanup of contamination sites located at military installations. These plans and programs, in addition to established legislation (e.g., CERCLA, RCRA, etc.) effectively form the “safety net” intended to protect the environment.

3.6.2 Existing Conditions

3.6.2.1 Hazardous Materials and Wastes

The ROI for hazardous materials and wastes consists of the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area adjacent to the Clear Zone.

Hazardous materials are serviceable products intended for a given operation or task. The JBLE-Eustis is a large-quantity generator and processes all hazardous waste generated at the installation through its Hazardous Waste Accumulation Facility. The use and disposal of hazardous and toxic substances are regulated by the CERCLA, the RCRA, and the “Toxic Substances Control Act”. The installation complies with all applicable requirements of these laws and JBLE-Eustis Regulation 200-6, *Environmental Management*, including all procedures for hazardous and toxic materials storage, handling, and disposal. There are fuel storage tanks at Felker Army Airfield within the paved area of the Felker Army Airfield.

The JBLE-Eustis obtains all serviceable hazardous material products through its Hazmat Facility. This allows the installation to monitor and control the use of these materials, thereby preventing excess quantities and supporting compliance with the Emergency Planning and Community Right-to-Know Act as well as implementing efficient spill prevention techniques and develop feasible response assets.

3.6.2.2 Installation Restoration Program

The IRP implements the Defense ERP that identifies, investigates and cleans up contamination at active Army installations. The JBLE-Eustis is currently conducting environmental cleanup efforts under the guidelines established under the CERCLA. The JBLE-Eustis was included on the EPA's National Priorities List with 27 sites being managed under the IRP. None of the 27 sites identified in the IRP are located in the ROI.

3.6.2.3 Military Munitions Response Program

The Military Munitions Response Program focuses on identifying, investigating and cleaning up hazardous materials on military lands. The Military Munitions Response Program addresses unexploded and discarded munitions. There are no known military munition sites located in the ROI.

3.7 BIOLOGICAL RESOURCES

3.7.1 Definition of Resource

Biological resources include native or naturalized plants, fish, invertebrate organisms, microorganisms, wildlife, and the habitats in which they occur. Sensitive biological resources are defined as those plant, fish, invertebrate organisms, microorganisms, and wildlife species, and their habitats that are federally and state listed as threatened, endangered, of special concern, or candidate. The ESA protects listed species and habitat against killing, harming, harassment, or any action that may damage their habitat. Federal Species of Concern are not protected by the ESA; however, these species could become listed and protected in the future. The USFWS identifies and lists federally protected species and habitats. The Commonwealth of Virginia state listed species and their habitats are protected in accordance the ESA (29.1-563 et seq. of the Code of Virginia) and the Virginia Endangered Plant and Insect Species Act (3.2-1000 et seq. of the Code of Virginia). The Virginia Department of Game and Inland Fisheries (VDGIF) and the Virginia Department of Agriculture and Consumer Services (VDACS) are responsible for administering Virginia's endangered species regulations.

Migratory birds, as listed in 50 CFR 10.13, are protected by the Migratory Bird Treaty Act (MBTA), as amended, which was enacted to protect migratory birds from capture, pursuit, hunting, or removal from natural habitat. Over 800 bird species are currently protected under the MBTA. In 2001, EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, was issued to ensure that federal agencies consider environmental effects on migratory bird species and, where feasible, implement policies and programs supporting the conservation and protection of migratory birds.

Sensitive habitats include those areas designated by the USFWS and/or the National Marine Fisheries Service as critical habitat protected by the ESA and sensitive ecological areas as

designated by state or federal rulings. Sensitive habitats also include wetlands, sensitive upland communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g. migratory routes, breeding areas, feeding/forage areas, crucial summer/winter habitats).

Federally funded projects are required to address Essential Fish Habitat requirements as mandated by the 1998 amendments to the Magnuson-Steven Fishery Conservation and Management Act. However, no designated Essential Fish Habitat is located within the ROI and therefore, this will not be discussed further.

Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act (CWA) and EO 11990, *Protection of Wetlands*. Wetlands are defined by the USACE and the USEPA, as, “those areas that are inundated or saturated by a surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3[b]). The USACE has authority to regulate jurisdictional wetlands as *Waters of the U.S.* under Section 404 of the CWA; EO 11990, *Protection of Wetlands*, and the related DoD Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, provide guidance concerning how to mitigate or minimize any net loss of wetlands.

Wetlands in the Commonwealth of Virginia are regulated by the USACE, under Section 404 of the Clean Water Act, and by the VDEQ, under their Water Protection Permit Program. Under Section 404, the USACE regulates the discharge of fill or dredged material. Both the USACE, under Section 10 of the Rivers and Harbors Act of 1899, and the Virginia Marine Resources Commission (VMRC), regulate tidal waters and subaqueous lands. The VDEQ’s authority is not limited to the discharge of fill or dredged material; the VDEQ regulates any alteration of wetlands.

3.7.2 Existing Conditions

3.7.2.1 Vegetation

The ROI for vegetation consists of the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area adjacent to the Clear Zone. Both herbaceous and forested uplands and tidal and non-tidal wetlands are found in the ROI. Based on an aerial GIS imagery analysis and field verification, a wetland jurisdictional delineation was completed by the USACE, Norfolk District in May 2015. Figure 3-4 depicts vegetation types and open water within the ROI based on the wetland jurisdictional determination. Table 3-6 provides the estimated acreages of vegetation types in the ROI.

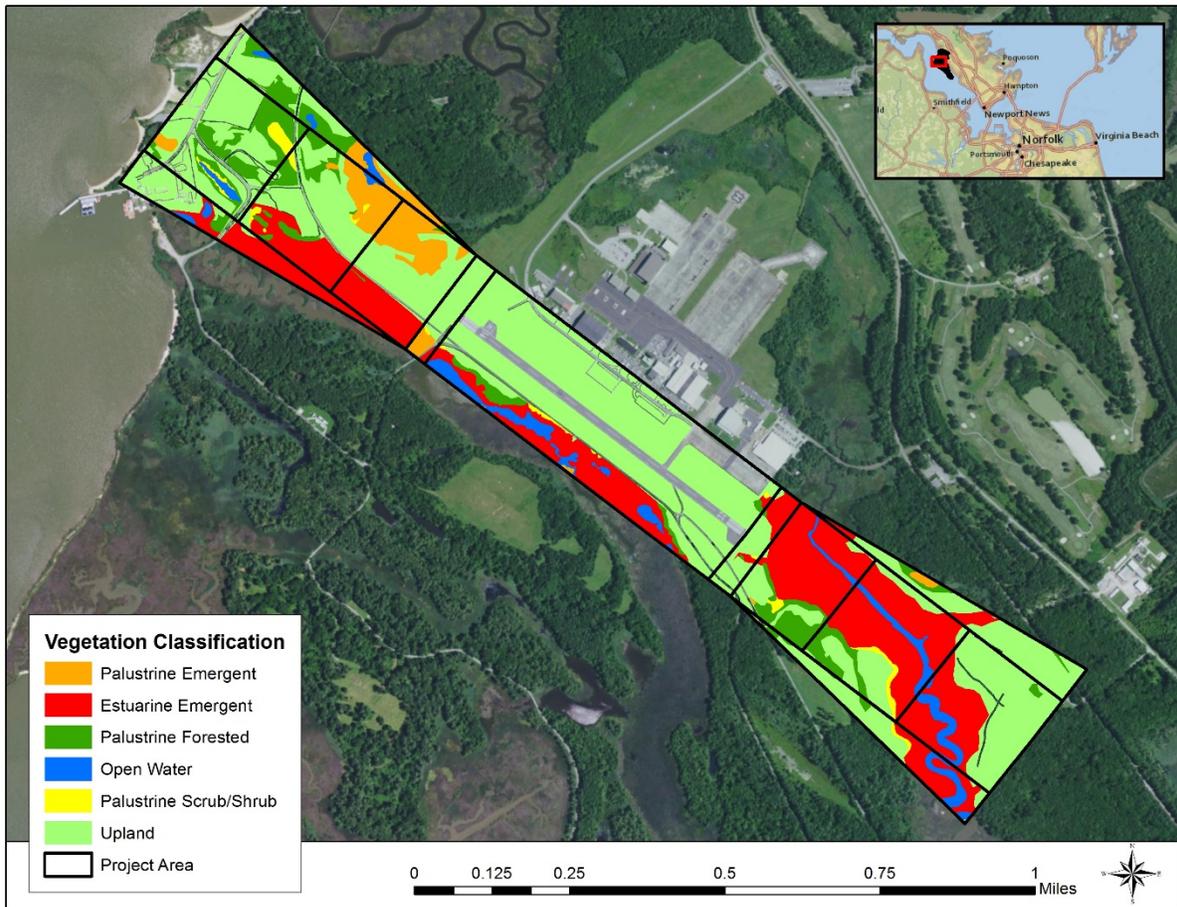


Figure 3-4. Open water and vegetation types in the Region of Influence

Table 3-6. Estimated acreages of vegetation types in the Region of Influence

| Location | Vegetation Classification | | | | |
|---------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|--|----------------|
| | Estuarine Emergent Wetland (acres) | Palustrine Emergent Wetland (acres) | Palustrine Forested Wetland (acres) | Palustrine Scrub/Shrub Wetland (acres) | Upland (acres) |
| Primary Surface | 9.69 | 0.14 | 1.63 | 0.25 | 41.21 |
| Clear Zone 1 (North) | 5.37 | 5.80 | 0.10 | 0.05 | 11.11 |
| Clear Zone 2 (North) | 5.34 | 3.74 | 2.73 | 0.45 | 9.68 |
| Clear Zone 3 (North) | 0.02 | 0.48 | 5.22 | 1.02 | 13.16 |
| Clear Zone 1 (South) | 12.87 | 0.03 | 3.05 | 0.28 | 5.91 |
| Clear Zone 2 (South) | 13.31 | 0.00 | 1.98 | 0.71 | 5.38 |
| Clear Zone 3 (South) | 7.33 | 0.00 | 0.18 | 0.00 | 13.17 |
| Approach Departure Clearance Surfaces | 10.10 | 2.29 | 4.82 | 0.23 | 22.38 |
| Total Acres | 64.03 | 12.47 | 19.71 | 2.98 | 122.00 |

Wetlands located in the ROI consist of estuarine (tidal) and palustrine (non-tidal) wetlands. Per the Cowardin Classification System for Wetlands (Cowardin et al. 1979), the following wetland types are found in the ROI:

- Estuarine Emergent Wetlands;
- Palustrine Emergent Wetlands;
- Palustrine Forested Wetlands; and
- Palustrine Scrub/Shrub Wetlands.

Uplands including both forested and non-forested areas are located within the ROI. These range from relatively immature mixed hardwood stands, approximately 10-15 years old, to older growth, approximately 50 years of age. These areas are composed of approximately two-thirds coniferous species, with loblolly pine (*Pinus taeda*) dominating portions of the forest cover.

In the Landing Zone, which includes the immediate vicinity of the runway, taxiway, and aircraft operational surfaces, grass is maintained to an approximate height of less than six inches. There are limited open grassy areas in the ROI as well.

Vegetation species that occur in the ROI based on the Integrated Natural Resources Management Plan (INRMP) (JBLE-Eustis et al. 2014) are provided in Appendix D.

3.7.2.2 Wildlife

The ROI for wildlife is the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone.

Avian and wildlife surveys were conducted in the ROI and adjacent areas as part of the BASH Prevention Program in 2016 and 2017 (Priestly 2017; Priestly 2016). Acoustic and limited mist net monitoring for bat species was conducted in 2016 (St. Germain 2016). The bat survey was conducted May 16-20 and July 21-August 11, 2016 in accordance with USFWS survey protocols by a USFWS-approved surveyor using the *Range-wide Indiana Bat Summer Survey Guidelines*. This survey involved acoustic and mist net methods. As a result, two male northern long-eared bats were captured via mist netting and also identified via acoustic detection. Other bat species, including the federally listed Indiana bat that were detected via acoustic monitoring are provided in the wildlife species list that is provided in Appendix D.

Based on the wildlife lists provided in the INRMP (JBLE-Eustis et al. 2014), avian and wildlife surveys conducted for the BASH Program in 2016-2017 (Priestly 2017; Priestly 2016), and the bat survey results (St. Germain 2016) a listing of wildlife that occurs in the ROI was developed and is provided in Appendix D.

3.7.2.2.1 Species Protected under the Migratory Bird Treaty Act of 1918 and Executive Order 13186

The MBTA and EO 13186 requires agencies to protect and conserve migratory birds and their habitats. The MBTA, 16 USC 703–712, makes it unlawful, without a waiver or permit, to pursue, hunt, take, capture, kill or sell birds listed therein ("migratory birds"). The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs, and nests. Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the USFWS. Under the MBTA, take of migratory birds, their nests or eggs requires a USFWS permit. Even so, *Take of Migratory Birds by the Armed Forces*, 50 CFR 21, states that in the case of military readiness, "If the Armed Forces determine that ongoing or proposed activities may result in a significant adverse effect on population of a migratory bird species, the Armed Forces must confer and cooperate with the Service [USFWS] to develop and implement appropriate conservation measures to minimize or mitigate such significant adverse effects."

The ROI is used by migratory birds for foraging, nesting, sheltering, and stop over areas. The emergent, scrub-shrub, forested wetlands, and grassy areas in the ROI provide a wide variety of habitat to a diverse array of migratory bird species (for a listing of migratory birds that occur in the ROI please refer to Appendix D). The base does not currently monitor avian nesting or nesting success in the ROI (with the exception of eagle nests), so it is uncertain which species are nesting and how successful nesting efforts are in the ROI. The red knot (*Calidris canutus rufa*) was documented by the USFWS Trust Resources Report (2017) as a migratory bird in the ROI but has not been detected in the ROI or surrounding areas based on recent avian monitoring conducted for the BASH Prevention Program (Priestly 2017; Priestly 2016).

In late summer and fall, many of the species designated in the MBTA migrate south for the winter; in Virginia, however, some species listed as migratory remain in Virginia and do not migrate south for the winter. The ROI is located in the Atlantic Flyway, one of the four major pathways traversed by migratory avian birds to pass between breeding and wintering grounds. Other species winter in the southern United States, Mexico, the Caribbean or Central America while others go as far as South America. Then, each spring they return north to their breeding grounds. Some migratory avian species rest and refuel in the ROI during their spring and fall migrations. Others winter south and return to the ROI each spring to breed.

3.7.2.2.2 Bald Eagles Protected under the Migratory Bird Treaty Act and the American Bald and Golden Eagle Act of 1972

Once federally listed as endangered, the bald eagle has made a remarkable comeback. It is currently protected under both the MBTA and the American Bald and Golden Eagle Act; the bald eagle remains a state listed threatened species. It is still protected under the Bald and Golden Eagle Protection Act, which protects the eagles from “taking,” which is defined as, to “pursue, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” Bald eagles breed throughout much of Canada and Alaska, in addition to scattered sites across the lower 48 states, from California to the southeastern U.S. coast and Florida. Wintering habitat covers most of the contiguous U.S., with some year-round distribution in the northwest. Northern birds return to breeding grounds as soon as weather and food availability permit, generally between January and March.

A large raptor, the bald eagle has a wingspan of about seven feet. Adults have a dark brown body and wings, white head and tail, and a yellow beak. Juveniles are mostly brown with white mottling on the body, tail, and undersides of wings. Bald eagles typically breed and winter in forested areas adjacent to large bodies of water. However, such areas must have an adequate food base, perching areas, and nesting sites. Throughout its range, it selects large, super-canopy roost trees that are open and accessible. Nests are constructed from an array of sticks placed in an interwoven pattern. Other materials added as fillers may include grasses, mosses, and even corn stalks. Nests are massive; often exceeding several thousand kilograms in weight.

Per data collected by the JBLE-Eustis in 2017, no eagle nests are reported to occur in the ROI or within 2,000 feet of the ROI, and existing nest data is depicted on Figure 3-5. The JBLE-Eustis

maintains a permit for eagle take as they do conduct harassment and egg and nest removal in the ROI as part of the BASH Prevention Program.

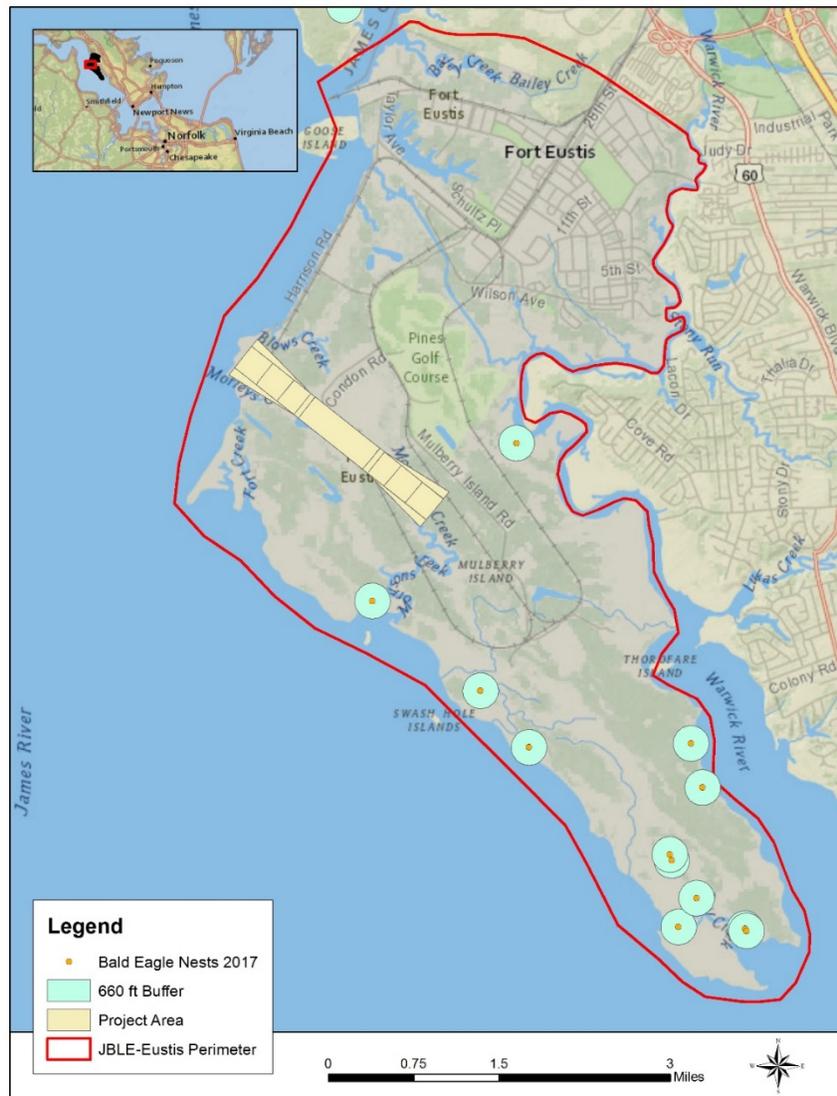


Figure 3-5. Location of Bald Eagle Nests at the Joint Base Langley Eustis-Fort Eustis

3.7.2.2.3 Threatened and Endangered Species

The federally and state listed northern long-eared bat and Indiana bat and the state listed little brown bat (*Myotis lucifugus*) and tricolored bat (*Perymyotis subflavus*) have the potential to occur in the ROI as they have been detected through previous survey efforts conducted at the JBLE-Eustis in 2016 (St. Germain 2016). Although previous bat monitoring was conducted in 2016 in the vicinity of the ROI (but not in the ROI), the ROI has the potential to provide foraging and maternal roosting and pupping habitat for these species (although this is unknown at this time). No winter hibernacula for these species is known to occur in the ROI.

The USFWS Official Species List that was obtained from the Information, Planning, and Consultation (IPaC) System only included the northern long-eared bat (USFWS 2016), however, the USFWS (2017) Trust Resources Report (provided in Appendix C) also included the red knot. Therefore, because of the known presence of the Indiana bat at the JBLE-Eustis and the inclusion of the red knot on the Trust Resources Report, both of these species will also be described. No designated critical habitat exists in the ROI (USFWS 2017; USFWS 2016).

Northern Long-Eared Bat. The USFWS listed the northern long-eared bat threatened in 2015 with no designated critical habitat. The most severe threat attributed to the substantial population decline of the northern long-eared bat has been the widespread increase in White-Nosed Syndrome that is caused by the fungal infection *Pd* (*Pseudogymnoascus destructans*). The Action Area is located within the managed White-Nose Syndrome Buffer Zone as defined by the USFWS (2015a). Populations in Virginia are thought to have declined by 96% and are anticipated to decline with the continued spread of White-Nose Syndrome (VDGIF 2014, unpublished data in USFWS 2015). The northern long-eared bat is dark brown on its back with lighter coloration underneath with a wingspan of approximately nine to 10 inches and is approximately three to four inches in body length (USFWS 2015). This bat is distinguished from other similar bat species in its genus by the length of its ears that extend past its nose when folded. During the winter, northern long-eared bats hibernate in caves and mines called hibernacula. During the summer, this species roosts beneath bark and in cavities of both live and dead trees (snags). They will also roost in human-made structures such as culverts, barns, and sheds. Females give birth to one young during the summer. No winter hibernacula are known to occur in the Action Area.

Indiana Bat. The Indiana bat was listed as federally endangered in 1967 throughout its range in the U.S. because of declining populations caused by disturbance of bats during hibernation and modification of their hibernacula. The Indiana bat has dark brown to black fur a small wingspan of nine to 11 inches (USFWS 2017a). Indiana bats consume flying insects along rivers or lakes and in uplands. Indiana bats hibernate in large numbers during the winter in caves, or occasionally in abandoned mines. Indiana bats mate in the fall prior to hibernation. Following hibernation, Indiana bats migrate to their summer habitats in wooded areas where they roost under loose tree bark on dead or dying trees (USFWS 2017a). Indiana bats use trees as roosting and foraging sites in the summer. The loss and fragmentation of forested habitat has the potential to impact this species.

Red Knot. The red knot was listed as federally threatened in 2014. Red knots are characterized by their large, bulky sandpiper body form and a short, straight bill that tapers at the tip. Their head and breast are reddish in color during the breeding season but gray in color during the rest of the year. Red knots are known for their extensive migrations that can occur more than 9,300 miles from the Tierra del Fuego to the Canadian Arctic (USFWS 2016a). The decline of the red knot population in the 2000s is thought to be attributed to degrading foraging habitats. Delaware Bay is a key stopover for migrating red knots before they reach their breeding grounds in the Canadian Arctic. Horseshoe crab harvests in Delaware Bay are now under management to help recover the

red knot population. Red knots are thought to be vulnerable to the increasing threats of climate change that may impact the arctic tundra ecosystem in their breeding areas, coastal foraging habitats and other foraging habitats, and storm and weather changes (USFWS 2016a). Within the past few years, the population is thought to have stabilized but still remains at low population levels (USFWS 2016a).

Based on surveys conducted for the BASH Prevention Program in the ROI and surrounding areas, the red knot has not been detected in the ROI nor in the vicinity of the ROI at the JBLE-Eustis (Priestly 2017; Priestly 2016). Also, the ROI would not provide suitable habitat for this species so it would be highly unlikely that this species would occur in the ROI.

As recommended by the USFWS Virginia Field Office, the Virginia Department of Game and Inland Fisheries Database and the Virginia Department of Conservation and Recreation National Heritage Resources Database was cross-referenced with the USFWS Official Species List provided via IPaC to identify any potential additional federally species that have the potential to occur in the ROI (list provided in Appendix D). The database provides results within a three-mile radius of the search point. Based on the results of the database search cross referenced with existing JBLE-Eustis flora and faunal lists (provided in Appendix D) and habitats that occur in the ROI, we do not anticipate any additional federal or state listed species to occur in the ROI besides the bat species that are provided in Appendix D.

3.8 CULTURAL RESOURCES

3.8.1 Definition of Resource

Several federal laws and regulations have been established to manage cultural resources, including the National Historic Preservation Act (NHPA) of 1966, the Archeological and Historic Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archeological Resource Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. In addition, DoDI 4710.02, *Department of Defense Interactions with Federally-Recognized Tribes* (2006), governs DoD interactions with federally-recognized tribes and EO 13175, *Consultation and Coordination with Indian Governments* (2000), charges federal departments and agencies with regular and meaningful consultation with Native American tribal officials in the development of policies that have tribal implications. In order for a cultural resource to be considered significant, it must meet one or more of the following criteria for inclusion on the National Register of Historic Places (NRHP):

“The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and: 1) that are associated with events that have made a significant contribution to the broad patterns of our history; or 2) that are associated with the lives or persons significant in our

past; or 3) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or 4) that have yielded, or may be likely to yield, information important in prehistory or history” (36 CFR 60.4).

3.8.2 Existing Conditions

3.8.2.1 Regional Archeological Setting

Earliest human inhabitation of the Americas remains one of the most debated issues in archaeology, but it is well evidenced that Native Americans began to inhabit the Chesapeake Bay region over 12,000 years ago. Many of the sites left by the ‘Paleo-Indians’ of this period may now be submerged on the bottom of the bay, its tributaries and the Atlantic continental shelf; sea-levels during the Wisconsin Glaciation of the Pleistocene epoch, or Ice Age, were some 400 feet below contemporary levels (Bratton et al. 2002).

During the Archaic Period, 8000–1200 Before Common Era (BCE), populations were evidently low, but grew considerably. The Archaic Period is divided into Early (8000-6500 BCE), Middle (6500 to 3000 BCE) and Late (3000 to 1200 BCE) Archaic Periods. Along with increasing population, there is evidence of an increased diversity in resources hunted and gathered for food, with a particularly notable expansion in fishing and shellfish gathering (Thompson and Worth 2011).

Around 1200 BCE, people in the region began making and using pottery. This marks the beginning of the Woodland Period, also divided into Early (1200-500 BCE), Middle (500 BCE to CE 900), and Late (CE 900-1600) Woodland Periods. Through the Woodland Period populations increased with the expansion of agriculture, as did political hierarchy. The settlement pattern consisted of a series of hamlets strung along the shores of the major estuaries with a larger, often palisaded, chief’s village central to them. This was the state of native culture in the Chesapeake Bay region during the Protohistoric Period to 1600-1650 CE (Turner 1992). John Smith’s map (Figure 3-6), based on observations made in 1608, shows no native settlements in the vicinity of the project area.



Figure 3-6. John Smith (1612) Map (red line identifies approximate project area) (Smith and Hole 1624).

The closest Native American village in 1608 was *Warraskoyack*, a chief's village, with its two outlying communities of *Mathomauk* and *Mokete*, about nine miles south of the Area of Potential Effect, around present day Smithfield (Figure 3-6). *Kiskiack* was another settlement about 10 miles overland to the north. The larger Native American sites along the lower James River are most often located on points and near the mouths of major tributaries, and often include artifacts from several, or all of the periods of prehistory (Hantman 1990).

Jamestown, the first permanent English settlement in America, was founded a few miles up the James River in 1607. Within a decade, settlement had spread beyond Jamestown Island to settlements such as nearby Martin's Hundred, in and around the later location of Carter's Grove Plantation. Homesteads were established on Mulberry Island soon after, making it one of the earliest areas of European settlement in Virginia. John Rolfe, who introduced tobacco cultivation to Virginia and married Pocahontas, obtained land there in 1619. By 1670 there were several homesteads on Mulberry Island as shown on the Augustine Herrman map (Figure 3-7).



Figure 3-7. Augustine Herrman Map, Section of the Lower James River (the approximate area of the Joint Base Langley Eustis-Fort Eustis area is circled in red) (Herrman 1673).

The colony prospered with the production of tobacco expanding through the 17th into the 18th century. This expansion in production was facilitated with the expansion of African enslavement. In Warwick County (predecessor to the City of Newport News), the black portion of the population went from less than $\frac{1}{6}$ in 1699 to more than $\frac{3}{4}$ in 1755. After the middle of the 18th century, the tobacco industry declined in eastern Virginia, a consequence of soil exhaustion.

The Virginia Peninsula was the scene of the first major Union offensive in the east during the Civil War. General George McClellan's Peninsula Campaign, in the spring of 1862, spurred the development of elaborate defenses by the Confederates. At JBLE-Eustis, the remains of the southern end of the Magruder Line can be seen at Fort Crafford at the southwest point of Mulberry Island, and lines of earthworks to the northeast. This defensive line stretched across the Peninsula ending in Yorktown. Although laboriously constructed, the earthworks on Mulberry Island never saw any direct combat.

Although Newport News began to develop industry with the coming of the C&O railroad in the 1880's, Mulberry Island remained a quiet backwater, with the exception of a small brick factory.

With the coming of World War I, the area was acquired by the U.S. Army for a Coast Artillery Corps training camp, and named Camp Eustis. It was renamed Fort Eustis after the war, but abandoned during the 1930's before being reactivated in 1941, again for training Coast Artillery personnel. During the course of World War II, Fort Eustis became the headquarters for the Army Transportation Corps. In 1946 all transportation training for the Army was moved to Fort Eustis, as it remains today. After the 2005 Base Realignment and Closing closed Fort Monroe, the Army Training and Doctrine Command was moved to Fort Eustis as well (Barry et al. 2015; McDaid 2011).

3.8.2.2 Archaeological Resources at Fort Eustis

Surveys have recorded 234 archaeological sites at Fort Eustis, the majority of them on Mulberry Island. Of these, only 18 sites have been evaluated for NRHP eligibility. The Area of Potential Effect (or as referred to for other resources the ROI) for cultural resources is the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Zone adjacent to the Clear Zone (Figure 3-8). There are seven sites within or partially within the Area of Potential Effect for this project (Figure 3-8) (This figure will be redacted in publicly available version of the EA.). These sites as well as adjacent sites outside the APE are listed in Table 3-7.

FIGURE 3-8 NOT AVAILABLE TO PUBLIC

Figure 3-8. Archeological sites within the Area of Potential Effect and bordering areas (This figure will be redacted from publicly available copies of the Environmental Assessment)

Table 3-7. Archeological sites at Joint Base Langley Eustis-Fort Eustis, Felker Army Airfield Area, within or bordering the Area of Potential Effect (Virginia Department of Historic Resources 2016)

| Site | Period(s) | Notes | NRHP Status | Area |
|----------|--|---|---------------|------|
| 44NN0089 | 18th - 19th c. | Based on map projection, no physical evidence, mapped house may be another known site | Not Evaluated | 3 |
| 44NN0102 | Early, Middle, and Late Woodland; 19th and 20th c. | Recommended NRHP eligible by investigator | Not Evaluated | ADCS |
| 44NN0120 | Early-Middle Woodland; 17th c. | Eligibility determination not concluded with SHPO | NRHP Eligible | ADCS |
| Site | Period(s) | Notes | NRHP Status | Area |
| 44NN0124 | Prehistoric-Undetermined | | Not Evaluated | ADCS |
| 44NN0125 | Prehistoric-Undetermined; late 18th-early 19th c. | | Not Evaluated | 3 |
| 44NN0126 | Early Archaic; 17th c. | Northern portion of site disturbed | Not Evaluated | 3 |
| 44NN0202 | Late 19th c. | Northern portion of site disturbed | Not Evaluated | 2 |
| 44NN0203 | 19th c. | In an open field | Not Evaluated | ADCS |
| 44NN0204 | 19th-early 20th c. | Possible feature identified | Not Evaluated | 1 |
| 44NN0355 | Middle Woodland; 19th c. | Southern boundary of the site was not defined by the survey | Not Evaluated | ADCS |

ADCS: Approach-Departure Clearance Surface; NRHP = National Register of Historic Places

3.8.2.3 Historic Built Environment at Fort Eustis

No NRHP eligible historic built resources would be in the Area of Potential Effect including the visual areas of potential effect. There is one NRHP listed building at Fort Eustis, the 18th century Mathew Jones House (121-0006) located 2.7 kilometers (1.67 miles) north of the western end of the project. The Project Area is within the Civil War Battle of Yorktown study area established by the American Battlefield Protection Program (ABPP), but miles outside of core areas of the

battlefield and areas identified by the ABPP as potentially NRHP eligible. Fort Crafford (121-0027/44NN0070) is a Civil War earthwork fort built around the site of an 18th century house which no longer stands. It is an individual listing in the NRHP, and is 0.8 kilometer (0.5 mile) southwest of Felker Army Airfield, outside of the Area of Potential Effect. All buildings over 50 years old at Fort Eustis, including an administrative building at Felker Army Airfield, were recently surveyed and the installation as a whole evaluated as the Fort Eustis Historic District (121-0105), but the district was determined not NRHP eligible.

3.9 GEOLOGY AND SOILS

3.9.1 Definition of Resource

Geological resources consists of surface and subsurface materials and their properties. The term *soil*, in general, refers to unconsolidated materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential and erodibility typically are described in terms of their complex type, slope, physical characteristics, and relative compatibility or constraining properties with regard to particular construction activities and types of land use. *Topography* is the change in elevation over the surface of a land area. An area's topography is influenced by many factors, including human activity, underlying geologic material, seismic activity, climatic conditions, and erosion. A discussion of topography typically encompasses a description of surface elevations, slope, and distinct physiographic features and their influence on human activities.

3.9.2 Existing Conditions

The JBLE-Eustis lies on the Pleistocene-aged (10,000 to 1.6 million years ago) Princess Anne terrace formation. Approximately 2,000 feet of unconsolidated Tertiary (28 to 66 million years ago) and Cretaceous (66 to 144 million years ago) period sediments separated by an unconformity lie between the terrace and the granite basement rock. These deposits, consisting of clay, silt, sand, and gravel with variable amounts of shell material, thicken and drop eastward toward the Atlantic Ocean. The thickness of the terrace varies from 15 to 20 feet, and it is of marine origin.

There are seven soil associations on JBLE-Eustis in addition to disturbed or urban soils. The soil associations include two general groups: low river terrace and marsh soils, and low coastal plain upland soils. Hydric soil associations in the project area are presented in Figure 3-9. Soil types of the project area are presented in Figure 3-10.

Drainage characteristics, textural characteristics, landscape position, and some potential limitations associated with the mapping units are provided. Mapping units that are designated as hydric or have inclusions that are hydric are also indicated.

Soils in the Low River Terrace and Marsh associations were formed in alluvium along the James and Warwick rivers and their tributaries. Soils in these associations range from well to very poorly

drained, with subsoil and substrata textures that range from sandy to clayey. The soils are gently sloped or level and are prone to flooding. These associations account for 75 percent of the soil associations found locally.

Soils on the Low Coastal Plain Uplands were formed in fluviomarine sediments. Soils range from well to poorly drained with subsoil textures that range from loamy to clayey. These associations are deep, nearly level to steep sloping, and are not subject to flooding. They support woodlands and account for 22 percent of the soil associations found locally.

The Urban and Disturbed Lands association contains soils that have been used at building sites. They comprise about three percent of the surveyed area. Felker Army Airfield grounds consist of mostly Urban and Disturbed Lands soils. The proposed action would take place on grounds surrounding Felker Army Airfield, which are a mix of upland and hydric (primarily Bohicket Mucky Silty Clay) soil types. Hydric soils sometimes, but not always, indicate the presence of wetlands.

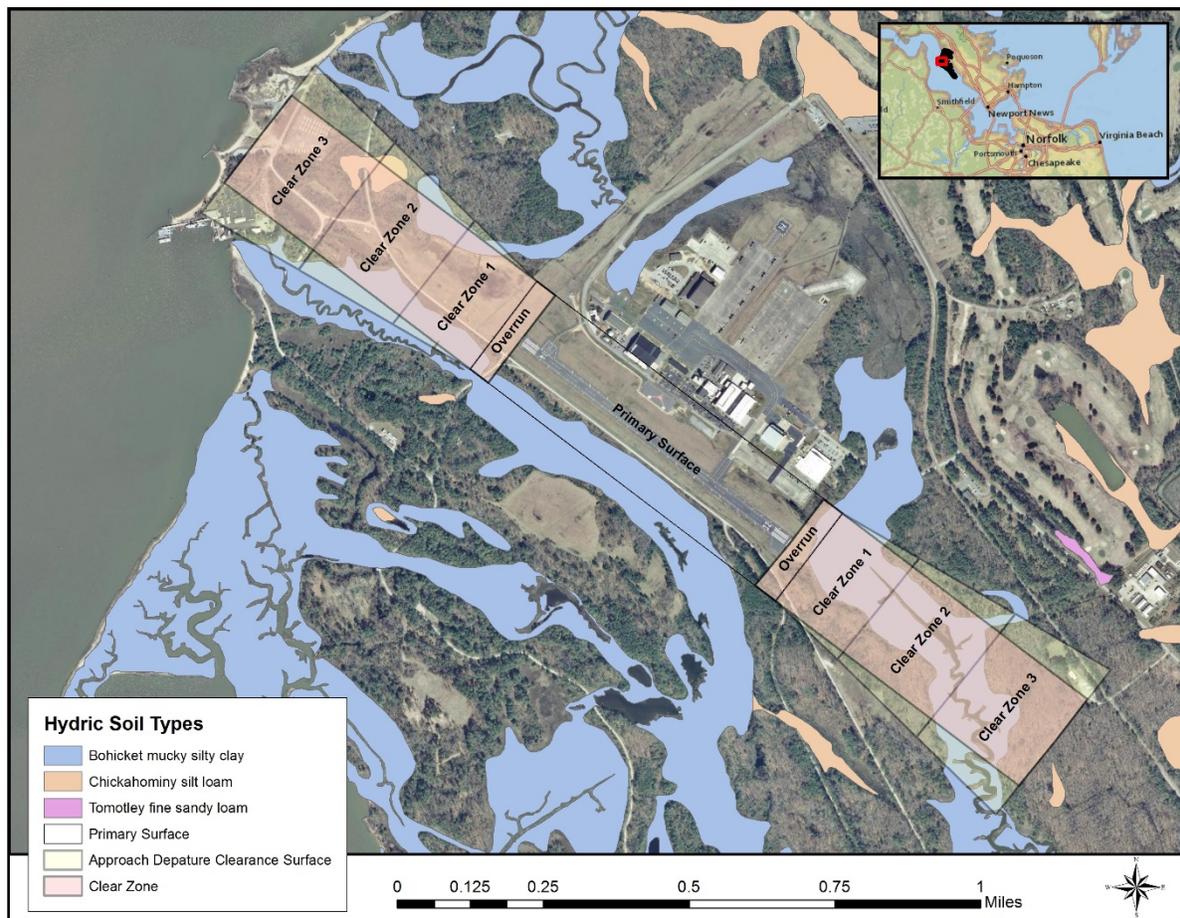


Figure 3-9. Hydric soils within the Region of Influence and surrounding areas

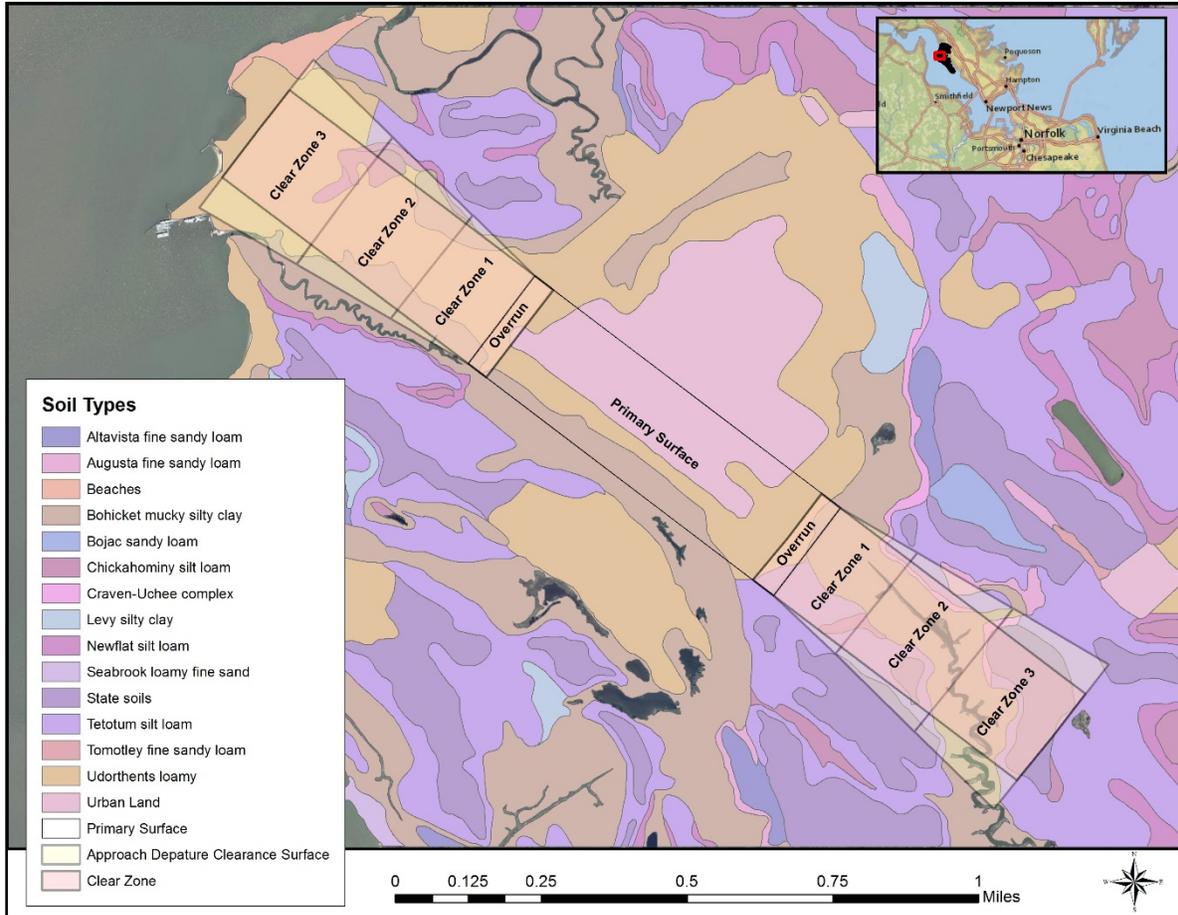


Figure 3-10. Soil types within the Region of Influence and surrounding areas

3.10 TRANSPORTATION AND CIRCULATION

3.10.1 Description of Resource

Transportation and circulation refers to the movement of vehicles throughout a road and highway network. Primary roads include major interstates and other principal arterials designed to move traffic but not necessarily to provide access to all adjacent areas. Secondary roads include rural routes and major surface streets that provide access to residential and commercial areas, hospitals, and schools. The capacity of transportation networks and quality of circulation may be described in annual average daily traffic volumes or level of service.

3.10.2 Existing Conditions

The ROI for Transportation and Circulation includes the network of roads used to access the JBLE-Eustis and any roads or access points in and around the limits of the Primary Surface and the Approach-Departure Clearance Surface Area. This consists of the local road and street network and military training routes/roads at the JBLE-Eustis. Major roads near the project area that could

be used to access the JBLE-Eustis include Warwick Boulevard, Fort Eustis Boulevard, Washington Boulevard, Jefferson Avenue and Interstate 64.

3.11 AESTHETICS AND VISUAL RESOURCES

3.11.1 Description of Resource

Aesthetics and visual resources are those natural resources, landforms, vegetation, and constructed structures in the environment that generate one or more sensory reactions and evaluations by the observer.

3.11.2 Existing Conditions

The local aesthetics in the ROI and the area around Felker Army Airfield consist of a relatively undeveloped natural landscape that contains open water areas, wetlands and upland habitats. The remainder of the landscape consists of the airfield itself and supporting infrastructure including access roads. Wildlife within the natural landscape contributes to the aesthetics of the area, particularly species such as migratory birds and other species people observe recreationally.

4 ENVIRONMENTAL CONSEQUENCES

Air Force Instruction 32-7061 directs USAF officials to follow 32 CFR 989 which specifies the procedural requirements for the implementation of the NEPA and requires consideration of environmental consequences as part of the planning and decision-making process. Environmental impacts that are anticipated to result from implementation of the USAF action alternatives and the No Action Alternative described in Section 2, *Proposed Action and Alternatives*, are identified and evaluated in this section. Issues studied are presented by resource area and location, as described in Section 3, *Affected Environment*.

Guidelines established by the CEQ (40 CFR 1508.27) specify that significance should be determined in relationship to both context and intensity (severity). The assessment of potential impacts and the determination of their significance are based on the requirements of 40 CFR 1508.27. Three levels of impact can be identified:

- *No impact*—No impact is predicted;
- *Less than significant impact*—An impact is predicted, but the impact does not meet the intensity/context significance criteria for the specific resource;
- *Significant impact*—An impact is predicted that meets the intensity/context significance criteria for the specific resource.

The Proposed Action at the JBLE-Eustis would attain and maintain vegetation clearances in the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area adjacent to the Clear Zone in accordance with the UFC 3-260-01 to the maximum, extent practical. The Proposed Action meets the purpose and need described in Section 1.2, *Purpose and Need for the Proposed Action*. Potential impacts associated with the action alternatives that are described in Section 2, *Proposed Action and Alternatives*, are described below.

4.1 LAND USE

4.1.1 Approach to Analysis

Determination of land use impacts is based on the degree of land use sensitivity in the area. In general, the USAF considers a land use impact to be significant if it would 1) be inconsistent or non-compliant with applicable land use plans or policies; 2) preclude an existing land use of concern from continuing to exist; 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 (e.g., related to increased noise levels).

4.1.2 Impacts

4.1.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Within the Primary Surface and Clear Zone, land training operations that includes navigation training, ambush training, and reconnaissance training may be negatively impacted by implementation of the action alternatives. Because these training operations are affected by visibility of the terrain, these training operations would be negatively impacted by reductions in vegetation cover and vegetation height. Therefore, implementation of Alternative 1, as compared to the other action alternatives, would have the most impact to land-based training operations, as trees would be cut to stumps both within Clear Zone 2 and Clear Zone 3. Out of the Action Alternatives, Alternative 3 would have the least impact to land-based training operations, as it only involves topping of trees in Clear Zone 2 and Clear Zone 3. Alternative 2 would have intermediary negative impacts to training operations, as it involves cutting trees to stumps in Clear Zone 2 and topping of trees in the Clear Zone 3. Implementation of any of the action alternatives (alternatives 1, 2, or 3) would have a *less than significant impact* to land use.

4.1.2.2 No Action Alternative

Implementation of the No Action Alternative would not alter existing land uses and airfield operations and military training operations in the lands surrounding the airfield would continue in the ROI. Eventual closure of operations, starting with instrument approaches, and eventually cessation of fixed wing operations, could occur if a vegetation maintenance program is not implemented. Therefore, implementation of the No Action Alternative could have a *potentially significant impact* to land use if a UFC 3-260-01 waiver cannot be obtained for the entire ROI.

4.2 NOISE

4.2.1 Approach to Analysis

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a Proposed Action. Potential changes in the noise environment can be beneficial (i.e. they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e. if the total area exposed to unacceptable noise levels is essentially undetectable), or adverse (i.e., if they result in increased exposure to noise levels). An increase in noise levels due to introduction of a new noise can create an impact on the surrounding environment. In general, the USAF considers a land use impact to be significant if its noise levels would exceed applicable noise standards or create substantial areas of incompatible use.

4.2.2 Impacts

4.2.2.1 Alternatives 1, 2, and 3 (Preferred Alternative),

Short-term, adverse effects on the noise environment would be expected from implementing any of the action alternatives. Minor increases in noise would result from using equipment during initial tree removal, cutting, topping, and mowing operations, as well as long-term vegetation maintenance activities.

Implementation of the action alternatives would require the use of logging equipment as well as brush mowers and forest mowers. Individual pieces of heavy equipment typically generate noise levels of approximately 80 to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can increase at locations within several hundred feet of active sites. The zone of relatively high noise levels typically extends to distances of 400 to 800 feet from the site of major equipment operations. Locations more than 1,000 feet from sites seldom experience appreciable levels of noise. There are no residences, schools, churches, or hospitals within 1,000 feet of the ROI that would be impacted by the increased noise levels. Given the temporary and intermittent nature of the tree removal, cutting, and topping and mowing activities, the distance to the nearest noise sensitive area, and the predominance of local aircraft noise, these effects would be minor. Clearing activities would not occur at night. It is not expected, therefore, that the action would violate the Newport News noise ordinance. While the action would increase overall noise levels in the ROI, the background noise levels at Felker Army Airfield are typically at a level of 65 dBA resulting from aircraft operations, and the proposed action would not significantly alter the noise profile in the local area. While areas with reduced tree cover may conduct sound further, extensive forested areas outside the ROI would continue to buffer noise levels resulting from aircraft operations and from the tree removal, cutting, topping and mowing operations.

Although effects to the noise environment would be minor, best management practices that would be implemented to minimize noise effects would include the following:

- Limiting clearing activities to occur only during normal weekday business hours;
- Properly maintaining equipment mufflers; and
- Ensure that all personnel conducting tree removal, cutting, topping and mowing operations wear adequate personal hearing protection to limit exposure and ensuring compliance with federal health and safety regulations.

Vegetation maintenance that would occur in the ROI would result in similar levels of noise as the initial clearing. However, maintenance activities would typically be shorter in duration. Given the distance to the nearest noise sensitive receptors, and the predominance of local aircraft noise, these effects would be minor as well. Therefore, impacts to the noise environment would be *less than significant* with implementation of any of the action alternatives.

4.2.2.2 No Action Alternative

Under the No Action Alternative, no tree clearing, cutting, or topping or mowing beyond existing mowing operations would occur and there would be no effect on local ambient noise levels. Noise levels would remain at their current levels.

4.3 AIR QUALITY

4.3.1 Approach to Analysis

Air Force Instruction 32-7040, *Air Quality Compliance and Resource Management*, provides a framework for ensuring that USAF actions conform to appropriate implementation plans and requirements. Section 3.5.2 of AFI 32-7040, *Conformity Rules*, ensures that such actions conform to the applicable implementation plan through the U.S. EPA General Conformity Rule. Section 3.5 of AFI 32-7040, *Environmental Impact Analysis Process (EIAP) Planning (applicable to all installations under the regulatory oversight of the EPA)*, outlines requirements under the NEPA for analysis of air quality impacts.

An air quality impact would be deemed significant if total direct and indirect emissions would exceed applicability thresholds, would be regionally significant, or the action would violate a local, state, or federal air regulation.

4.3.2 Impacts

4.3.2.1 Alternatives 1, 2, and 3

Temporary, adverse impacts to air quality would result from exhaust emissions generated from gas and diesel powered equipment and vehicles. With implementation of any of the action alternatives, emissions would be generated from vehicles and equipment used to remove, cut, and transport vegetation. This could include logging trucks and equipment, dump trucks, and brush and forestry mowing equipment. Lighter, handheld equipment such as chainsaws and limb cutters would also be used and would increase emissions as well. To minimize emissions, vehicles and equipment will not be allowed to idle and would be shut off at all times when not in use. The vegetation maintenance activities would also generate fugitive dust emissions. Dust minimization measures such as application of water to trails/roads or equivalent measures would be implemented as needed.

Because the JBLE-Eustis is located in a designated attainment area, preparation of a detailed air emissions analysis for a Conformity Determination is not required. Thus, a *Record of Non-Applicability Concerning the General Conformity Rule* was prepared and is provided in Appendix D. Increases in emissions would not exceed applicability thresholds, be regionally significant, or contribute to any violation of a federal, state, or local air regulation. Air quality impacts are not anticipated to cause noticeable local, regional, or global climatic changes.

Impacts to air quality would be *less than significant* with implementation of any of the action alternatives.

Greenhouse Gas Emissions. With implementation of any of the action alternatives, tree removal, cutting, and topping and mowing operations would result in short-term, temporary Greenhouse Gas (GHG) (i.e. carbon dioxide) emissions from operation of logging and mowing equipment. However, this would not result in any measurable increase in regional GHG emissions. Consequently, implementation of the action alternatives would result in a *less than significant*, short-term increase in GHG emissions.

Implementation of any of the action alternatives would not significantly increase risks to structures in the ROI that may be at risk of loss from sea level rise. Consequently, impacts to climate change with implementation of any of the action alternatives would be *less than significant*.

4.3.2.2 No Action Alternative

The No Action Alternative would result in no impact or change to ambient air quality. No clearing of trees would take place and therefore, air emissions would not change as compared to current conditions. Ambient air quality would remain as described in Section 3.3, *Air Quality*. There would be no effect to GHG emissions with implementation of the No Action Alternative other than those emissions that currently occur from maintenance of grassy areas. Implementation of the No Action Alternative would have *no effect* on climate change beyond current conditions.

4.4 WATER RESOURCES

4.4.1 Approach to Analysis

An impact to water resources would be significant if implementation of an alternative would: 1) reduce water availability to or interfere with the supply of water to existing users; 2) create or contribute to the overdraft of groundwater basins or exceed decreed annual yields of water supply sources; 3) adversely affect surface or groundwater quality; 4) threaten or damage unique hydrologic characteristics; 5) violate established laws or regulations that have been adopted to protect or manage water resources.

4.4.2 Impacts

4.4.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Surface Water and Water Quality

Standard BMPs would be implemented during project implementation to mitigate any potential impacts to surface water. Stormwater BMPs would be used to prevent and mitigate potential erosion and sedimentation impacts. Tree removal, cutting operations, and topping operations would be controlled in accordance with forestry BMPs to reduce potential disturbances to soils and surface water quality.

Stormwater BMPs would be used to prevent and mitigate erosion and sedimentation impacts to water quality. Prior to construction, a Stormwater Pollution Prevention Plan approved by the VDEQ as authorized under the Virginia Stormwater Management Program Regulation (9 VAC 25-870) that includes erosion control practices, inspection procedures, and other BMPs would be required. An erosion and sediment control plan approved by the VDEQ would be developed that minimizes soil exposure and compaction during construction and controls stormwater discharges to minimize soil erosion. Specific measures to minimize soil exposure and compaction that would be required during project implementation are described in Section 6, *Special Procedures*. In the Primary Surface and Clear Zone 1, soil disturbance would be minimized to the maximum extent practicable by individual grinding of stumps and hand cutting of roots. Following tree removal, a native, perennial seed mixture would be planted. Forestry and stormwater BMPs that would be followed during project implementation are detailed in Section 6, *Special Procedures*.

Therefore, implementation of forestry and stormwater BMPs would mitigate any potential impacts to surface water and would result in *less than significant impacts* to surface water and water quality with implementation of any of the action alternatives.

Groundwater

Implementation of any of the action alternatives would not result in the potential for impacts to groundwater quality. Consequently, there would be *no impact* to groundwater at JBLE-Eustis with implementation of any of the action alternatives.

Floodplains

The tree removal, cutting and topping sites are located in the 100-year and 500-year floodplain. Removal of trees and topping of trees may negligibly reduce the ability of the floodplain to retain water. However, herbaceous vegetation would be allowed in all of Clear Zones (Clear Zone 1, Clear Zone 2, and Clear Zone 3) and trees and shrubs would be allowed in the Approach-Departure Clearance Surface Adjacent to the Clear Zone as long as they do not penetrate ten feet below the Approach-Departure Clearance Surface. In addition, trees would also be allowed in the Clear Zone 3 with Alternative 2 and would be allowed both in the Clear Zone 2 and Clear Zone 3 with Alternative 3, as long as they do not penetrate 10 feet below the Approach-Departure Clearance Surface. Implementation of any of the action alternatives would not result in any significant alternation in the hydrology and would not divert overland floodwater flow. Therefore, no significant flood hazard would be increased or would be created. Existing structures in the ROI that consist of the supporting buildings and infrastructure for the Felker Army Airfield would not be at increased risk of flooding from implementation of any of the Action alternatives. Therefore, implementation of any of the action alternatives would result in *less than significant impacts* to floodplain management.

Coastal Zone Management Act Consistency

As described in Section 1.4, *Coastal Zone Consistency Determination*, the JBLE-Eustis is located within the designated coastal zone that is subject to the requirements of the CZMA. In accordance with the Virginia Coastal Resources Management Program, a Coastal Zone Management Evaluation has been prepared for the Preferred Alternative, Alternative 3 and is provided in Appendix B. The USAF's Consistency Statement will be submitted to the VDEQ. The VDEQ will assemble and review the comments provided by the various state agencies and determine if the project is consistent with the Coastal Zone Management Program.

4.4.2.2 No Action Alternative

Under the No Action Alternative, water resources at the JBLE-Eustis would remain unchanged from existing conditions as described in Section 3.4, *Water Resources*. There would be *no effect* to surface water quality, groundwater, or floodplains with implementation of the No Action Alternative.

4.5 SAFETY AND OCCUPATIONAL HEALTH

4.5.1 Approach to Analysis

If implementation of an alternative would substantially increase risks associated with an aircraft mishap potential or flight safety relevant to the public or the environment, it would represent a significant impact. For example, if an action involved an increase in aircraft operations such that mishap potential would increase significantly, air safety would be compromised.

4.5.2 Impacts

4.5.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Implementation of any of the action alternatives would result in a long-term, safety benefit for aircraft take-offs and landings at the Felker Army Airfield from the improved vegetation clearances. There is an existing BASH Risk that under the current (No Action Alternative) conditions ranges from negligible to minor impacts that are less than significant. With implementation of any of the action alternatives, as compared to the No Action Alternative, BASH impacts may slightly increase in the Primary Surface and the Clear Zone 1 because the removal of trees and shrubs would create some open spaces dominated by herbaceous species that could become preferable foraging areas for geese. In addition, implementation of any of the action alternatives would make permanent and ephemeral open water areas more visible to waterfowl and wading bird species such as herons and egrets. Because of their flight patterns and body type, geese, wading birds, and waterfowl are species more prone to hit aircraft than other species. However, the cutting of trees to stumps and also topping of trees would reduce nesting and foraging habitats for a variety of avian species and would be anticipated to reduce some of the existing BASH hazards. Alternative 1 may present less overall BASH hazards than Alternative 2 or

Alternative 3 as dead and dying trees and topped trees may create some preferential perching and/or nesting sites for some raptors. The existing BASH Prevention Program would continue at the JBLE-Eustis to help mitigate potential BASH risks at the Felker Army Airfield.

Because project workers would be responsible for complying with standard operating procedures and applicable health and safety plans and regulations including Occupational Safety and Health Administration, 29 CFR 1910, no significant impacts to health and safety would be expected from implementation of any of the action alternatives. Personnel or contractors conducting tree removal, cutting, topping and mowing operations would wear required Personal Protective Equipment at all times. Base personnel would be excluded from work zones during tree removal, cutting, and topping operations and mowing operations to ensure occupational safety and health risks to Base personnel are not increased from implementation of any of the action alternatives. Impacts to occupational safety and health would be *less than significant*.

4.5.2.2 No Action Alternative

Vegetation in the Primary Surface, Clear Zone, and Approach-Departure Surface Area adjacent to the Clear Zone would continue to remain a significant hazard to aircraft during take-offs and landings at the Felker Army Airfield. Over time, without vegetation maintenance, the safety hazard may continue to increase as more vegetation and trees grow to higher heights in the ROI. Not maintaining tree vegetation clearances that provide a proper margin of safety for aircraft take-offs and landings continues to be a potentially significant impact on occupational safety and may be mitigated in the future by curtailing flight operations at the Felker Army Airfield. The BASH Prevention Program currently in place at the Felker Army Airfield helps to mitigate potential BASH risks. Consequently, impacts to safety with implementation of the No Action Alternative would be considered *potentially significant*.

4.6 HAZARDOUS AND TOXIC MATERIALS AND WASTES

4.6.1 Approach to Analysis

Numerous federal, state, and local laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes; the primary purpose of these laws is to protect public health and the environment. The severity of potential impacts associated with hazardous substances is based on their toxicity, ignitability, and corrosivity. Impacts associated with hazardous materials and wastes would be considered significant if the storage, use, transportation, or disposal of hazardous substances substantially increases the human health risk or environmental exposure.

4.6.2 Impacts

4.6.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Vegetation clearing activities with any of the action alternatives could result in spills of hazardous materials, notably fuels and antifreeze, from chainsaws, heavy equipment, and mowing equipment. Herbicides may be used on some tree stumps and topped trees to prevent tree regrowth. Response to such spills is addressed in the installation's Spill Prevention and Countermeasures Plan; and the procedures described by that plan would be followed. Any hazardous substances, petroleum contaminants, or contaminated soils generated would be disposed of in accordance with federal, state, and local regulations. Thus, with implementation of any of the action alternatives impacts would be *less than significant*.

Installation Restoration Program Sites

There is no IRP site in the immediate area of the Felker Army Airfield; the majority of the sites exist in the cantonment area. No alteration or disturbance of any IRP site would occur with implementation of any of the action alternatives, therefore, there is *no anticipated impact* to IRP sites.

4.6.2.2 No Action Alternative

There would be *no impact* on hazardous and toxic substances and/or waste under the No Action Alternative as current operation procedures and activities would continue and no new activity that would use or generate any hazardous materials would be undertaken.

4.7 BIOLOGICAL RESOURCES

4.7.1 Approach to Analysis

Significance criteria used in assessing impacts to biological resources are based on 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Impacts to biological resources would be significant if implementation of the alternative would adversely affect a threatened or endangered species; greatly diminish habitat for a plant or animal species; substantially diminish a regionally or locally important plant or animal species; interfere with wildlife movement or reproductive behavior; and/or result in an infusion of exotic plant or wildlife species.

4.7.2 Impacts

4.7.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Vegetation and Wetlands

Light Detection and Ranging data that was collected at the JBLE-Eustis in 2014 was evaluated to assess vegetation heights in the ROI to determine the approximate acreage of vegetation impacts with implementation of the action alternatives. Vegetation heights were analyzed to identify any shrubs (shrubs were defined as LIDAR points exceeding eight inches in height, but less than 15 feet in height) that would require mowing and the location of trees in the Primary Surface and Clear Zone 1 (trees were defined in our analysis as LIDAR points exceeding 15 feet) and any trees whose heights would penetrate the Approach-Departure Clearance Surface in the Clear Zone 2 and Clear Zone 3 and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone (Clear Zone 1, Clear Zone 2, and Clear Zone 3).

Because the LIDAR analysis is based on canopy impacts, the acreages of estimated vegetation impacts is likely overestimated. This data is also based on 2014 conditions and in the future, maintenance may be required in any of the areas in the ROI which includes the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area that is located adjacent to the Clear Zone. Depending on the alternative, the type of impacts to vegetation and soils would vary in the Clear Zone 2 and Clear Zone 3; however, the initial acres of impact remain constant as some type of vegetation impact (i.e. removal, cutting to stumps, and/or tree topping) could occur in these portions of the Clear Zone. Based on the results of the analysis of the wetland vegetation types defined in the wetland jurisdictional determination and the LIDAR vegetation height data, the estimated location and amount of vegetation impacts from initial implementation of the action is provided in Figure 4-1 and Table 4-1. The estimated location and amount of vegetation impacts found within the RPAs in the ROI from the initial implementation is provided in Figure 4-2 and Table 4-2.

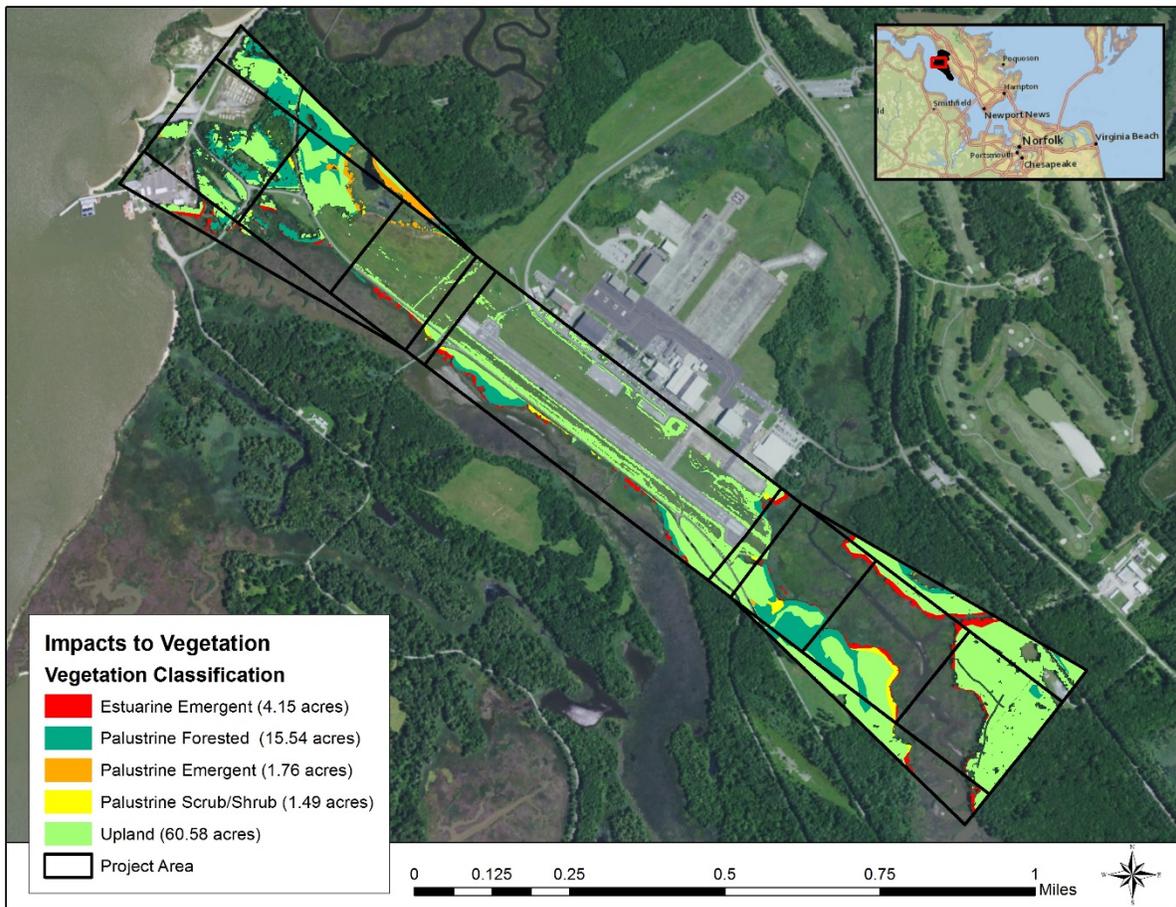


Figure 4-1. Initial estimated vegetation impacts in the Region of Influence

Table 4-1. Initial estimated vegetation impacts by vegetation type in the Region of Influence

| | Vegetation Classification | | | | |
|----------------------|------------------------------------|-------------------------------------|-------------------------------------|--|-----------------|
| | Estuarine Emergent Wetland (acres) | Palustrine Emergent Wetland (acres) | Palustrine Forested Wetland (acres) | Palustrine Scrub/Shrub Wetland (acres) | Uplands (acres) |
| Location | | | | | |
| Primary Surface | 0.73 | 0.00 | 1.62 | 0.25 | 13.03 |
| Clear Zone 1 (North) | 0.25 | 0.22 | 0.10 | 0.05 | 1.53 |
| Clear Zone 2 (North) | 0.17 | 0.45 | 2.40 | 0.10 | 4.31 |
| Clear Zone 3 (North) | 0.01 | 0.02 | 1.95 | 0.02 | 3.72 |
| Clear Zone 1 (South) | 0.55 | 0.03 | 3.05 | 0.28 | 5.05 |

| | Vegetation Classification | | | | |
|---------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|--|-----------------|
| | Estuarine Emergent Wetland (acres) | Palustrine Emergent Wetland (acres) | Palustrine Forested Wetland (acres) | Palustrine Scrub/Shrub Wetland (acres) | Uplands (acres) |
| Clear Zone 2 (South) | 1.10 | 0.00 | 1.96 | 0.69 | 5.34 |
| Clear Zone 3 (South) | 0.23 | 0.00 | 0.18 | 0.00 | 12.13 |
| Approach Departure Clearance Surfaces | 1.12 | 1.03 | 4.26 | 0.10 | 15.48 |
| Total Acres of Impact | 4.15 | 1.76 | 15.54 | 1.49 | 60.58 |

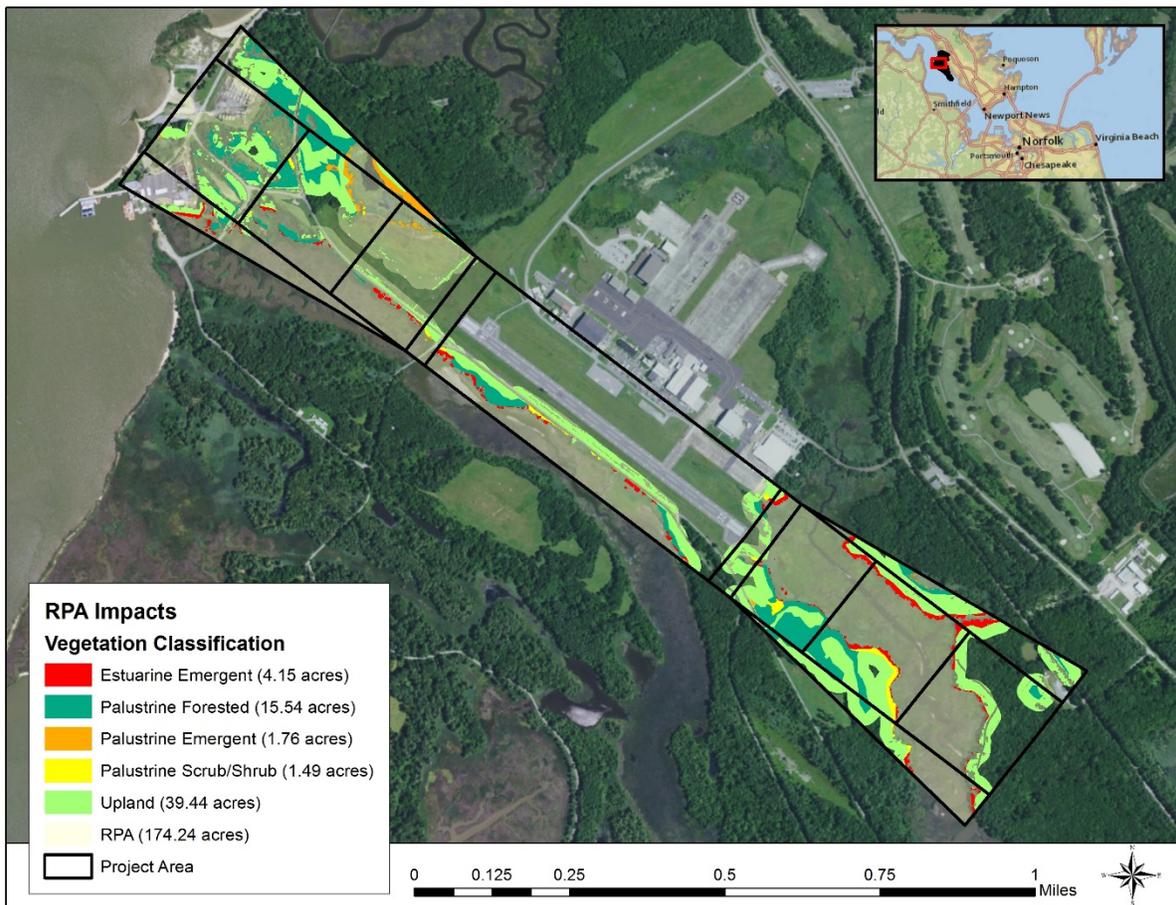


Figure 4-2. Initial estimated vegetation impacts by vegetation type in the Resource Protection Area within the Region of Influence

Table 4-2. Initial estimated vegetation impacts by vegetation type in the Resource Protection Area within the Region of Influence

| Location | Vegetation Classification | | | | |
|---------------------------------------|-----------------------------------|------------------------------------|------------------------------------|---------------------------------------|----------------|
| | Estuarine Emergent Wetland (acre) | Palustrine Emergent Wetland (acre) | Palustrine Forested Wetland (acre) | Palustrine Scrub/Shrub Wetland (acre) | Uplands (acre) |
| Primary Surface | 0.73 | 0.00 | 1.62 | 0.25 | 5.44 |
| Clear Zone 1 (North) | 0.25 | 0.22 | 0.10 | 0.05 | 1.15 |
| Clear Zone 2 (North) | 0.17 | 0.45 | 2.40 | 0.10 | 3.88 |
| Clear Zone 3 (North) | 0.01 | 0.02 | 1.95 | 0.02 | 3.49 |
| Clear Zone 1 (South) | 0.55 | 0.03 | 3.05 | 0.28 | 4.11 |
| Clear Zone 2 (South) | 1.10 | 0.00 | 1.96 | 0.69 | 5.26 |
| Clear Zone 3 (South) | 0.23 | 0.00 | 0.18 | 0.00 | 3.88 |
| Approach Departure Clearance Surfaces | 1.12 | 1.03 | 4.26 | 0.10 | 12.48 |
| Total Acres of Impact | 4.15 | 1.76 | 15.54 | 1.49 | 39.68 |

While the type of impacts to vegetation vary for the action alternatives, the overall acreage of impacts in the Primary Surface, Clear Zone 1, and the Approach-Departure Surface Area are the same. Within the Primary Surface and Clear Zone 1, the greatest impact to vegetation would occur in the uplands and the forested wetlands where all trees would be removed (stumps would be ground down and hand cut) from these areas. Within Emergent Wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps but no mowing of shrubs would occur. Per our analysis, this is a relatively small impact of less than approximately two acres, as most of the emergent wetlands do not provide viable habitat for trees and trees within this wetland type are typically occurring in the fringe area surrounding deeper emergent habitats. Within Forested Wetlands in the Primary Surface and Clear Zone 1, trees would be removed and shrubs would be mowed. The least impacts to vegetation would occur in the scrub/shrub wetlands where tree removal and mowing of shrubs would occur. Within the Approach-Departure Surface Area, trees would be topped (cut to the required height) if their heights are not 10 feet below the Approach-Departure Surface Area. Impacts to vegetation are greatest in uplands and forested wetlands. Some impacts also occur in Emergent Wetlands and Scrub/Shrub Wetlands, although impacts to these acres is substantively less as these types of habitats are not as suitable for trees due to their hydrological conditions. Long-term maintenance that would consist of application of pesticides in accordance with integrated pest management practices to tree stumps and topped vegetation and mowing operations would occur to maintain the vegetation clearances over time.

With implementation of Alternative 1, trees would be cut to stumps in Clear Zone 2 and Clear Zone 3. Long-term maintenance that would consist of application of pesticides in accordance with

standard integrated pest management practices to stumps would occur to prevent re-growth. Over time, this would change the vegetation character and composition of the local area. Similar to the other areas, the most substantive impacts in the Clear Zone 2 and Clear Zone 3 would occur in Uplands and Forested Wetlands with less impacts occurring in the Emergent Wetlands and Scrub/Shrub Wetlands.

With implementation of Alternative 2, trees would be cut to stumps in Clear Zone 2 and trees would be topped to 10 feet below the Approach-Departure Clearance Surface in the Clear Zone 3. Long-term maintenance that would consist of application of pesticides in accordance with standard integrated pest management practices to stumps and topped trees would occur to prevent re-growth. In addition, a LIDAR analysis, or equivalent method, would be done every five years to assess vegetation heights to determine vegetation maintenance needs.

With implementation of Alternative 3, trees with heights exceeding 10 feet below the Approach-Departure Clearance Surface would be topped to 10 feet below the Approach-Departure Clearance Surface in the Clear Zone 2 and Clear Zone 3. Long-term maintenance that would consist of application of pesticide in accordance with standard integrated pest management practices to stumps and topped trees would occur to prevent re-growth. In addition, a LIDAR analysis, or equivalent method, would be done every five years to assess vegetation heights to determine vegetation maintenance needs.

Overall, the topping of trees would result in less impacts to vegetation than cutting the trees to stumps. With the topping operation, some of the trees may survive, however, with the cutting to stumps tree mortality is evident. Tree topping would occur during the timeframe of September 16–April 14. Cutting of the trees during this time frame is necessary for protection of federally listed bat species. Topping of the trees can induce stress to vegetation, potentially making them more susceptible to pests and/or diseases. We would estimate some mortality of the trees to occur from the topping and/or use of the integrated pesticide management practices. The amount of mortality or potentially increased level of pests or disease that could occur from the topping operations is relatively uncertain. Therefore, of the action alternatives, Alternative 3 would have less impacts to vegetation as compared to the other alternatives, and Alternative 1 would have the most substantive impacts to vegetation. However, all of the vegetation impacts would be localized and impacts to wetlands where there would be soil disturbance and vegetation removal (in Palustrine Forested Wetlands and Palustrine Scrub/Shrub wetlands in the Primary Surface and Clear Zone 1) would be mitigated for in accordance with the CWA Section 404 requirements, the *Compensatory Mitigation for Losses of Aquatic Resources* (Mitigation Rule), 33 CFR Parts 325 and 332, and 62.1-44.15:21 B, Code of Virginia.

Additional coordination with the USACE and the VDEQ will be conducted prior to the implementation of an action alternative. An Individual Permit would be obtained pursuant to Section 404 of the Clean Water Act from the USACE and a 401 Water Quality Certification will be obtained from the VDEQ. In addition to standard stormwater and forestry BMPs (described in

Section 6, *Special Procedures*), additional standard mitigation measures would be specified in the permit requirements. The permit conditions would require that implementation of an action alternative:

- Avoid wetland and water impacts where practicable;
- Minimize potential impacts to wetlands and waters; and
- Compensate for any remaining, unavoidable impacts to wetlands or waters through activities to enhance or create wetlands/and or waters.

A formal mitigation plan consistent with the requirements of 32 CFR 989.15 and 32 CFR 989.22(d) has been prepared for the Preferred Alternative (and is provided in Appendix E) and will be finalized during the permitting process prior to project implementation. Therefore, we would anticipate that impacts to vegetation with implementation of an action alternative would be *less than significant*.

Wildlife

Implementation of any of the action alternatives would result in short-term to long-term, adverse, impacts to wildlife that range from minor to moderate impacts. Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats. This would also serve to protect other state-listed bats and non-listed bat species that may also be using this area for roosting and pupping habitat. Likewise, this restriction would also protect most potential direct losses of bird nests, eggs, and associated juvenile birds in the ROI, as nesting would occur during the time of year when tree and shrub removal and mowing would not be allowed. Therefore, the direct loss of bat or bird nests, eggs, or juvenile birds would be unlikely, as this would be mitigated by the implementation of the time of year restriction.

During operation of heavy equipment and mowers, most motile wildlife would be disturbed and would move away from the noise and disturbance impacts. Highly mobile wildlife such as white-tailed deer (*Odocoileus virginianus*) and eastern gray squirrels (*Sciurus carolinensis*) would move away from the noise and disturbance and utilize other comparable habitats at the JBLE-Eustis. However, impacts to these species would be minor as ample amounts of comparable habitats are found nearby at the JBLE-Eustis. There could be mortality of less mobile species, such as frogs, lizards, salamanders, snakes, turtles, and toads that cannot move away from the impact.

The noise and disturbance impacts to wildlife would be a short-term effect but there would also be long-term impacts from the loss and reduction in quality of foraging, breeding and nesting habitat to a variety of wildlife throughout the ROI. With implementation of an action alternative, there would be a long-term loss of wildlife habitat in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area. Some species would have to relocate foraging, breeding and

nesting habitats to other areas in the vicinity of the ROI. This may cause wildlife such as songbirds to move out of these areas permanently and find more suitable habitat. However, these impacts would be minor, as ample amounts of other similar habitats exist in the vicinity of the ROI.

Cutting of trees to stumps would generally reduce the quality of most wildlife habitat as compared to areas with topped trees, as the topped trees would still provide viable habitat to a variety of bird and mammal species, including bats. Some topped trees may continue to fruit and provide foraging habitat to a variety of bird and mammal species. In the event that the topped trees die, they would provide viable shelter and/or foraging habitat to a variety of wildlife such as bats and woodpeckers. With implementation of the action alternatives, impacts would be least for Alternative 3 (minor impacts), as the topped trees would still provide viable habitat to a variety of bird and mammal species. Impacts to wildlife would increase as cutting to stumps is increased as opposed to topping with Alternative 1 (moderate impacts) having the most impacts to wildlife followed by Alternative 2 (minor to moderate impacts). Overall, impacts to these species would be *less than significant* based on the scale of the project, the time of year restriction, and the ability of the more motile wildlife to move away from the impacts. Overall, impacts to biological resources would be less than significant.

Special Status Species

The federally and state listed northern long-eared bat and Indiana bat and the state listed little brown bat, and tricolored bat have the potential to occur in the ROI as they have been detected through previous survey efforts conducted at JBLE-Eustis in 2016 (St. Germain 2016). To protect any potential maternal roosting and pupping habitat in the ROI, a time of year restriction would be put in place where tree removal, cutting, and topping would not be allowed from April 15-September 15. Implementation of any of the action alternatives would cause some long-term loss of tree habitat for bat species; however, loss of tree habitat is not attributed as a driving cause for the decline of either these species and ample, comparable wooded habitat surrounding the ROI exists. Therefore implementation of the action alternatives *may affect, but is not likely to adversely affect* the northern long-eared bat and the Indiana bat and impacts would be *less than significant*. We would expect the same level of impact for the state listed bat species. The ESA, Section 7 Biological Evaluation was submitted to the USFWS on 30 November 2016 and the USFWS concurred with the findings of JBLE-Eustis that impacts to both bat species would be may affect, not likely to adversely affect. A copy of this correspondence is provide in Appendix C.

Red knots were listed in the USFWS Trust Resources Report (2017) in the Migratory Bird section of the listing. However, the red knot has not been identified in the ROI based on survey efforts conducted in the ROI and the vicinity of the ROI (Priestly 2017; Priestly 2016). Also, the ROI would not provide suitable habitat for this species, so it would be highly unlikely that this

species would occur in the ROI. Therefore we would anticipate there to be *no affect and therefore, no impact* to the red knot with implementation of any of the action alternatives.

There is no designated federal critical habitat located in the ROI for any species. Therefore, with implementation of any of the action alternatives there would be *no affect* to critical habitat.

Bald eagles are protected under the American Bald and Golden Eagle Act of 1972 and the MBTA, and are known to occur in the ROI. However, with the planned time of year restriction for the project, take of any nests, eggs, or juveniles would be unlikely. Implementation of an action alternative would cause a long-term loss of nesting habitat; however, there is other ample, comparable habitat surrounding the ROI. Also, because nests and eggs in the ROI are allowed to be removed for the safety of the airfield under an existing Bald Eagle Permit with the USFWS, removing the trees could actually reduce eagle nesting impacts if eagles would nest in locations away from the Felker Army Airfield. A Bald Eagle Permit may be required from the USFWS if a tree with an eagle nest will need to be removed or topped. However, based on the current data provided by the Center for Conservation Biology (2016) and Fort Eustis staff (James Dolan, pers. comm. 2017), no eagle nests currently exist in the ROI. Therefore, we would anticipate any impacts to bald eagles to be *less than significant*. Implementation of an action alternative would cause *less than significant* adverse impacts to birds under the protection of the American Bald and Golden Eagle Act of 1972 and the MBTA.

A notable variety of other species protected under the MBTA are known to occur in the ROI. Other than eagles, nesting and nesting success is not monitored at the JBLE-Eustis, so it is unknown which bird species are potentially nesting in the ROI and the number of nests in the ROI. However, suitable nesting habitat for a variety of birds under the protection of the MBTA exists within the ROI. Even so, with the planned time of year restriction for the project, any potential take of any nests, eggs, or juveniles would be unlikely. A MBTA Permit may be required from the USFWS if a tree with an active nest under the protection of the MBTA will need to be removed or topped. Implementation of an action alternative would cause a long-term loss of nesting habitat, however, other ample, comparable habitat surrounding the ROI exists. Therefore, implementation of an action alternative would cause *less than significant* adverse impacts to birds under the protection of the MBTA.

4.7.2.2 No Action Alternative

Under the No Action Alternative, there would be no change to the wildlife habitat around Felker Army Airfield. No effect to the habitat or local wildlife would be expected and conditions would remain the same for local flora and fauna.

4.8 CULTURAL RESOURCES

4.8.1 Approach to Analysis

Cultural resources considered in this section are those defined by the NHPA as properties listed in or eligible for listing in the NRHP and are referred to as historic properties. Historic properties eligible for listing in the NRHP include prehistoric and historic archaeological sites, structures, buildings, objects, landscapes, and collections of these in districts. Eligibility for listing in the NRHP is based on one or more of four criteria: a) association with important historic events or patterns of history; b) association with persons important in history; c) representative of the work of a master or exemplary as a type; or d) have yielded or may yield information important to history or prehistory.

Section 106 of the NHPA and its implementing regulations, 36 CFR Part 800, requires the lead federal agency, in this case the USACE, to assess the potential effects of an undertaking on historic properties that are within the proposed project's Area of Potential Effect, which is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 C.F.R. 800.16[d]). The lead federal agency consults with the SHPO who acts on behalf of the Advisory Council on Historic Preservation (ACHP) to identify historic properties affected, determine whether the effects are adverse, and resolve the adverse effects. The ACHP may participate in the resolution of significant adverse effects, or if there is any disagreement between the lead agency and the SHPO.

The identification of historic properties (NRHP eligible) process includes historical, architectural, and archaeological studies, as well as the inclusion of local residents and Indian tribes with special knowledge of a property's historic and cultural significance. In addition to the four criteria there are several criteria considerations which allow the possible eligibility of properties generally not considered eligible for the NRHP such as: properties less than 50 years old, buildings that have been moved, and cemeteries. Assessing effects to properties, determining if the effects are adverse to their historic character considers both direct and indirect effects. Direct effects are any that are introduced by the project, most clearly the physical destruction or alteration of all or part of a property. Other direct effects including altering the setting of a historic property, or introducing visual or noise intrusions are often termed 'indirect' as opposed to physical impacts, but are nonetheless direct results of the project implementation. Strictly speaking, indirect effects are those a project would make more likely, such as increased residential or commercial development, but are not a part of the subject undertaking.

A significant impact to cultural resources is an impact that diminishes or destroys the integrity of an NRHP property. This equates to adverse effect for Section 106 of the NHPA.

4.8.2 Impacts

4.8.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Implementation of any of the action alternatives has the potential to cause effects to the following cultural resources sites: 44NN0089, 44NN0125, 44NN0126, 44NN0202, and 44NN0204. These sites have not been evaluated for NRHP eligibility and therefore, must be assumed to be eligible for the NRHP. Site 44NN0120, although determined to be NRHP-eligible, does not have significant archaeological deposits within the Area of Potential Effect (i.e., ROI). Best management practices to mitigate soil disturbances and erosion as detailed in Section 6, *Special Procedures*, would mitigate potential impacts to cultural resources with implementation of any of the action alternatives. At tree removal sites in the Primary Surface and Clear Zone 1 (except in Emergent Wetlands where trees would only be cut to stumps), stumps would be individually ground and hand cut to minimize soil disturbances. Stumps would be ground only to the surface of the mineral soil. Following tree removal, a native, perennial herbaceous seed mix would be planted to help stabilize the soil surface. This would minimize any potential disturbances to Site 44NN0204. Cultural resource sites in Clear Zone 2 and Clear Zone 3, and the Approach-Departure Clearance Surface Area should not be adversely affected with implementation of any of the action alternatives. All cultural resource sites would be marked, with a 50 feet buffer around the mapped site boundary, as sensitive areas where ground disturbance is to be minimized during the removal of trees. Because BMPs to minimize soil disturbance and erosion would be followed, there should be *less than significant impacts* (no adverse effects) to cultural resources with implementation of any of the action alternatives.

4.8.2.2 No Action Alternative

The No Action Alternative would not result in any ground disturbance or changes to the landscape. Therefore, there would be no effects to cultural resources if the No Action Alternative is selected.

4.9 GEOLOGY AND SOILS

4.9.1 Approach to Analysis

An impact to geological resources would be considered significant if implementation of the Proposed Action would: 1) increase potential occurrences of erosion, siltation, or geological hazards (e.g., landslides); 2) incorporate engineering or construction techniques that do not adequately address potential geologic hazards; or 3) expose people or structures to major geological hazards. Generally, impacts with regards to geological resources can be avoided or minimized if proper construction techniques, erosion/siltation control measures, and structural engineering designs are incorporated into project development. Because potential impacts to geological resources would be limited to the project vicinity within the boundaries of the JBLE-Eustis there would be no impacts to regional geological resources and further analysis of off-base resources has been eliminated.

4.9.2 Impacts

4.9.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Standard BMPs would be implemented during project implementation to avoid and minimize potential impacts to soils to the maximum, extent practical. Stormwater BMPs would be used to prevent and reduce any potential erosion and sedimentation impacts. Tree removal, cutting operations, and topping operations would be controlled in accordance with forestry BMPs to reduce potential disturbances to soils, natural resources, and cultural resources.

Stormwater BMPs would be used to prevent and mitigate potential erosion and sedimentation impacts that have the potential to cause short-term impacts to soils. Prior to construction, a Stormwater Pollution Prevention Plan approved by the VDEQ as authorized under the Virginia Stormwater Management Program Regulation (9VAC25-870) that includes erosion control practices, inspection procedures, and other BMPs will be required. An erosion and sediment control plan approved by the VDEQ would be developed that minimizes soil exposure and compaction during construction and controls stormwater discharges to minimize soil erosion. Specific measures to minimize soil exposure and compaction will be required to follow during project implementation are described in Section 6, *Special Procedures*. In the Clear Zone 1 and the Primary Surface, soil disturbance would be minimized to the maximum extent practicable by individual grinding of stumps and hand cutting of roots. Following tree removal, a native, perennial seed mixture would be planted. Stormwater BMPs and forestry BMPs that would be followed during project implementation are detailed in Section 6, *Special Procedures*.

Therefore, implementation of forestry and stormwater BMPs would mitigate any potential impacts to geological resources and would result in *less than significant impacts* to geological resources with implementation of any of the action alternatives.

4.9.2.2 No Action Alternative

Under the No-Action Alternative, no tree removal, tree topping nor additional vegetation mowing would occur in the ROI. Consequently, geological resources would remain as described in Section 3.9, *Geology and Soils*. Therefore, implementation of this alternative is considered to result in no effects to geological processes and soils.

4.10 TRANSPORTATION AND CIRCULATION

4.10.1 Approach to Analysis

Potential impacts to transportation and circulation are assessed with respect to anticipated disruption or improvement of current transportation patterns and systems; deterioration or improvement of existing levels of service; and changes in existing levels of transportation safety. Beneficial or adverse impacts may arise from physical changes to circulation (e.g., closing, rerouting, or creating roads), or changes in daily or peak-hour traffic volumes created by

installation workforce and population changes. Adverse impacts to roadway capacities would be considered significant if roads with no history of exceeding capacity were forced to operate at or above their full design capacity.

4.10.2 Impacts

4.10.2.1 Action Alternatives 1, 2, and 3 (Preferred Alternative)

During project implementation, heavy haul trucks and trucks containing equipment and mowers as well as vehicles containing personnel and contractors would generate increased trips along the road network used to access the JBLE-Eustis and the JBLE-Eustis military routes/roads network. No anticipated road closures or re-routing of traffic is anticipated on the roads that would be used to access the JBLE-Eustis or on military routes/roads at the JBLE-Eustis. It is not anticipated that existing road capacities would be exceeded or require any type of modification with implementation of any of the action alternatives. With implementation of any of the action alternatives, adverse traffic impacts would be short-term and minor. Consequently, implementation of any of the action alternatives would result in *less than significant* impacts to transportation and circulation.

4.10.2.2 No-Action Alternative

Under the No Action Alternative, existing conditions with respect to transportation would remain as described in Section 3.10, *Transportation and Circulation*.

4.11 AESTHETICS AND VISUAL ENVIRONMENT

4.11.1 Approach to Analysis

Impacts to aesthetics and visual resources would be deemed significant if impacts include disturbances that could alter the overall character of the viewshed of a visual resource, and the viewshed might not resume its original character following the action.

4.11.2 Impacts

4.11.2.1 Alternatives 1, 2, and 3 (Preferred Alternative)

Implementation of the action alternatives would result in a long-term, adverse impact to the viewshed. Portions of the viewshed in the Primary Surface and the Clear Zone 1 would change from tree-dominated habitats to herbaceous-dominated habitats, however, the area would remain in a relatively undeveloped, natural state with the exception of the Landing Zone and associated buildings and structures. Trees within the Approach-Departure Clearance Surface Area adjacent to the Clear Zone would be topped to 10 feet below the Approach-Departure Clearance Surface. Of all of the action alternatives, Alternative 1 would have the greatest adverse impact to the viewshed; there would be long-term, adverse impacts to the viewshed as trees penetrating 10 feet below the Approach-Departure Surface would be cut to

stumps in both the Clear Zone 2 and Clear Zone 3. Alternative 2 is similar to Alternative 1, except trees penetrating the Approach-Departure Clearance Surface in the Clear Zone 3 are topped instead of being cut to stumps. Topping a limited portion of the trees over time would help to preserve the viewshed as the general character and appearance of the overall viewshed would remain largely intact. Alternative 3 is identical to Alternative 2 except there would be topping in Clear Zone 2 instead of cutting trees to stumps. Of all Alternatives, Alternative 3 has the least impacts to the viewshed as topping in the Clear Zone 2 and Clear Zone 3 would help retain the overall character of the viewshed more than the other two action alternatives. Impacts with implementation of Alternative 2 or Alternative 3 would result in minor, adverse impacts to the viewshed.

With all of the action alternatives, the wetlands and forested areas surrounding the ROI would remain undisturbed. While implementation of the action alternatives would result in an alteration in the local viewshed, it would still be a view of a relatively undeveloped, natural area (with the exception of the Landing Zone and associated buildings and structures), and the impact would be *less than significant*, as the alteration would not result in a degradation of the viewshed's overall character.

4.11.2.2 No Action Alternative

No impacts to aesthetic or visual resources are expected as no change to the current visual appearance of the proposed project area would be expected.

5 CUMULATIVE IMPACTS

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

5.1 Approach to Cumulative Impacts Analysis

Per CEQ guidelines for considering cumulative effects under NEPA, this cumulative impact analysis includes three primary considerations to:

1. Determine the scope of the cumulative analysis, including relevant resources, geographic extent, and timeframe;
2. Conduct the cumulative effects analysis; and
3. Determine the cumulative impacts to relevant resources.

5.1.1 Cumulative Projects

The CEQ guidelines require that potential cumulative impacts be considered over a specified time period (i.e., from past through future). The appropriate time for considering past, present, and reasonably foreseeable future projects can be the design life of a project, or future timeframes used in local master plans and other available predictive data. Determining the timeframe for cumulative impacts analysis requires estimating the length of time the impacts of a proposed action would last and considering the specific resource in terms of its history of degradation. The cumulative impacts analysis presented herein is not bound by a specific future timeframe. Per CEQ guidelines, in order to assess the influence of a given action, a cumulative impact analyses should be conducted using existing, readily available data and the scope of the cumulative impact analysis should be defined, in part, by data availability. Consequently, only past projects or reasonably foreseeable future projects with the potential to contribute to cumulative impacts of the Proposed Action or its alternatives have been evaluated in this section. While the cumulative impacts analysis is not limited by a specific timeframe, it should be recognized that available information, uncertainties, and other practical constraints limit the ability to analyze cumulative impacts for the indefinite future. Consequently, future actions that are speculative are not considered in this EA.

In assessing cumulative effects, previous projects and operations that have occurred in the ROI for individual resources were considered, as well as current project and operations such as the military training operations that occur in the ROI, and planned future projects in the ROI. The previous development of the Felker Army Airfield as described in Section 2.2, *History of the Felker Army Airfield and Mission Support*, was considered as part of the cumulative effects analysis. Continued operations to evaluate in the cumulative effects analysis would include

airfield operations, military training activities, BASH Prevention Program activities, and natural resource management activities. Within the ROI, a planned future project is the construction of an Aviation Complex south of the Felker Airfield Army runway and Primary Surface. An Aviation Complex is currently in the design phase at JBLE-Eustis. An EA has been prepared and was coordinated for public and agency review and no significant impacts were identified with the construction and operation of the Aviation Complex.



Figure 5-1. Future location of the Aviation Complex at the Joint Base Langley Eustis-Fort Eustis

Land Use. Implementation of any of the action alternatives would have an adverse, cumulative effect impact to military training operations in conjunction with the construction and operation of the Aviation Complex. However, the Sling-Load Training Area that would be displaced by the Aviation Complex would be relocated and impacts to training operations would not reach a level of significant impacts. While these actions could impact training operations, training operations could still commence and any cumulative impacts would be anticipated to be less than significant. We would not anticipate natural resources management to cause any significant, cumulative impacts with implementation of any of the action alternatives. Overall any potential cumulative impacts of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to land use.

Noise. Implementation of any of the action alternatives in conjunction with aircraft operations, current military training operations, and BASH Prevention Program operations could have an adverse, cumulative effect to noise levels. Also, there could be some adverse, cumulative impacts

to noise levels if tree removal, cutting, and/or topping operations occur concurrently with the construction of the aviation complex. While noise levels may increase with implementation of the action alternatives with current operations and the construction of the future Aviation Complex, we would not expect impacts to be significant. Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to noise levels.

Air Quality. Estimated emissions generated by the any of the action alternatives in the ROI (for Air Quality, this is the Hampton Roads Region) would be *de minimis* and would not be regionally significant. While implementation of any of the action alternatives would have adverse, cumulative effects with other existing sources in the Hampton Roads Region, and potentially future emission sources associated the construction and operation of the Aviation Complex, it is not anticipated that any of the action alternatives would cumulatively interact with other sources to generate a significant impact. Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to air quality.

Water Resources. Impacts to surface waters would be mitigated through implementation of forestry and stormwater BMPs. Also, impacts to water resources from future construction of the Aviation Complex would also be mitigated through implementation of stormwater BMPs. While implementation of the any of the action alternatives and construction of the Aviation Complex may have an adverse impact to floodplains, we would not expect these impacts to reach a level of significant impacts. Therefore, we would not anticipate any significant impacts to result from implementation of the action alternatives with the future construction and operation of the Aviation Complex. Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to water resources.

Safety and Occupational Health. Overall we would not anticipate implementation of any of the action alternatives to cumulatively interact with other past, present, or future actions to affect safety and occupational health. Therefore, there would be *no cumulative impacts* to occupational safety and health with implementation of any of the action alternatives with other past, present, or future actions.

Hazardous and Toxic Materials and Wastes. Overall we would not anticipate implementation of any of the action alternatives to cumulatively interact with other past, present, or future actions to affect hazardous and toxic materials and waste. Therefore, there would be *no cumulative impacts* to hazardous and toxic materials and waste and with implementation of any of the action alternatives with other past, present, or future actions.

Biological Resources. Past actions, including development of the airfield and supporting structures, and future construction of the Aviation complex would have some adverse cumulative

impacts to natural resources with implementation of any of the action alternatives to vegetation/wildlife habitat, wildlife, and threatened and endangered species. Overall, there would be a cumulative loss of vegetation that includes both wetlands and upland areas. However, wetland loss would be fully mitigated for both projects in accordance with CWA, Section 404 requirements. There would also be an associated cumulative adverse loss of wildlife habitat with implementation of the action alternatives with past development and the proposed future development site of the Aviation Complex. Notably there would be a direct loss of potential avian nesting habitat to species that include migratory birds. There would also be a cumulative loss of forested habitat that may be used by the federally and state listed northern long-eared bat and Indiana bat. It is uncertain how this habitat is used by the bats, however, it could be used as potential maternal roosting and pupping sites. Similar impacts would occur to the threatened state listed bat species that have the potential to occur in the area. Overall, however, roosting habitat loss is not attributed as a cause significantly contributing to the decline of listed bat species, and impacts would be largely controlled through implementation of a time of year restriction with implementation of any of the action alternatives. Training activities in the ROI may also contribute to vegetation and wildlife impacts by compaction of soils and also by causing flushing of wildlife. However, it is not anticipated that any of these adverse, cumulative impacts would reach a level of significant impacts. Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to biological resources.

Cultural Resources. With implementation of the action alternatives, potential adverse impacts to cultural resources would be controlled through implementation of forestry and stormwater BMPs. Therefore, we would anticipated there would be *no significant, cumulative effects* to cultural resources with implementation of any of the action alternatives with other past, present, or future actions.

Geology and Soils. Implementation of any of the action alternatives in association with past actions, including development of the airfield and supporting structures, and future construction of the Aviation complex would have some adverse, cumulative impacts to soils. Overall there would be short-term disturbances and long-term impacts to soils associated with the construction of the Aviation Complex. Training activities in the ROI may also contribute to soil impacts by compaction and increasing erodibility of soils. However, impacts to soils for all of these actions would be prevented and mitigated through the implementation of stormwater BMPs. It is not anticipated that any of these adverse, cumulative impacts would reach a level of significant impacts. Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to soils.

Transportation and Circulation. There could be adverse, short-term cumulative impacts to transportation and circulation if tree removal, cutting, and topping operations occurred concurrently with construction of the Aviation Complex. However, the impacts could be largely mitigated through project coordination and would not reach a level of significant impacts.

Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to transportation and circulation.

Aesthetics and Visual Resources. Implementation of any of the action alternatives in association with previous development in the ROI (runway and associated structures) as well as planned future development with construction of the Aviation Complex would have an adverse, cumulative effect to aesthetics and visual resources. However, this would be a localized impact and much of the landscape surrounding the airfield is already developed. Therefore, any potential cumulative effects of implementation of the action alternatives with past, present, or future anticipated actions would cause *less than significant* impacts to aesthetics and visual resources.

6 SPECIAL PROCEDURES

Impact evaluations conducted during preparation of this EA have determined that no significant impacts would result from implementation of the Proposed Action at JBLE-Eustis. This determination is based on a thorough review and analysis of existing resource information and coordination with knowledgeable, responsible personnel from the USAF and relevant local, state, and federal agencies.

Time of Year Restriction

No tree removal, cutting, or topping would be allowed during the time period of April 15-September 15 in order to protect potential northern long-eared bat and Indiana bat roosting and pupping habitat.

Best Management Practices

Standard BMPs would be implemented during project implementation to minimize potential impacts to resources to the extent practical. Tree removal and cutting operations would be controlled in accordance with forestry BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to mitigate any potential erosion and sedimentation impacts. Trees removed, cut down, or topped would be either be disposed of offsite or sold as timber. Shrubs and herbaceous vegetation would be disposed of offsite.

Stormwater BMPs would be used to prevent and mitigate erosion and sedimentation impacts that have the potential to cause short-term and long-term impacts to soils as well as water quality. Prior to construction, a Stormwater Pollution Prevention Plan approved by the VDEQ, as authorized under the Virginia Stormwater Management Program Regulation (9VAC25-870), that includes erosion control practices, inspection procedures, and other BMPs will be required. An erosion and sediment control plan approved by the VDEQ would be developed that minimizes soil exposure and compaction during construction and controls stormwater discharges to minimize soil erosion. Specific measures to minimize soil exposure and compaction and reduce potential impacts to stormwater that would be required to be followed during construction would consist of the following:

- Equipment and vehicles would be operated outside of wetlands wherever feasible and use mats when work in wetlands would be unavoidable.
- Heavy equipment, located in temporarily impacted wetland areas, would be placed on mats, geotextile fabric or use other suitable measures to minimize soil disturbance to the maximum extent practicable.
- Personnel and contractors would install and monitor erosion-prevention BMPs such as silt fences, sediment berms, and/or other equivalent sediment control measures as appropriate and in accordance with the approved Stormwater Pollution Prevention Plan.

- Personnel and contractors would apply permanent or temporary soil stabilization to denuded areas within seven days after final grade is reached on any portion of the site.
- Personnel and contractors would conduct soil testing prior to application of native seed mixes to determine if fertilizer would be necessary and to determine the appropriate nutrients and ratio of nutrients in the fertilizer.
- Personnel and contractors would apply fertilizer to planting sites in accordance with manufacturer's recommendations and do not apply nutrients during rainfall events.
- Personnel and contractors would inspect stormwater water BMPs and potential risks to stormwater (e.g. material stockpiles, silt fences, etc.) (i) at least once every four business days or (ii) at least once every five business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection would be conducted on the next business day.
- Disturbed areas would be stabilized immediately whenever any clearing, grading, excavating, or other land-disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and would not resume for a period exceeding 14 days.

Other BMPs that would be employed during project implementation would include the following:

- All trees that would be topped or removed would be properly marked to ensure that only those trees that are required to be removed would be impacted.
- All cultural resources sites would be marked with a sign stating "Sensitive Area" and fenced with a 50 feet surrounding buffer prior to any construction activities and during construction activities. Any tree felling within cultural resources sites would be restricted to the minimal necessary to remove trees and trees in adjacent areas will be felled away from the cultural resources sites.
- Forestry BMPs for selecting temporary road/trail sites, constructing temporary roads/trails, road and associated drainage practices would be followed as described in the *Virginia's Forestry Best Management Practices for Water Quality* Technical Manual (Virginia Department of Forestry 2011).
- Crossing of saturated areas would be avoided if possible but if deemed necessary, crossings would be temporarily constructed as described in the *Virginia's Forestry Best Management Practices for Water Quality* Technical Manual (Virginia Department of Forestry 2011).
- Use of access roads/trails would be minimized and would not cross through saturated areas if possible or within 50 feet of any cultural resources sites. Existing roads will be used whenever possible and would not cross cultural resource sites. The width of roads would be restricted to the width of the largest vehicle that would be used onsite for the tree removal efforts. Turn around areas would be restricted and limited to minimize impacts to soils and vegetation. All access points would avoid existing water bodies/saturated areas to the maximum, practical

extent. Should a crossing be necessary for vehicles and equipment, a bridge, culvert, pole ford or other equivalent BMP would be employed to minimize potential erosion and rutting.

- Log landings are the areas where tree logs would be concentrated, processed, sorted and loaded prior to being taken offsite. Log landings would follow the BMPs described in the *Virginia's Forestry Best Management Practices for Water Quality* Technical Manual (Virginia Department of Forestry 2011) to ensure any potential water quality/sedimentation issues are mitigated.
- Tree removal sites or sites disturbed by temporary access roads would be brought back to original grade and replanted with a native, perennial seed mixture.
- Application of any pesticides to control tree re-growth would be limited solely to the target vegetation.
- Equipment and cut trees would only be stored onsite during designated, upland staging areas. Any cut trees would not be left in wetland areas for more than one day after being cut.
- Surveyor's flagging or an equivalent methodology would be used to flag sensitive areas where equipment is not allowed to cross.
- Directional felling would be used to ensure that trees are not dropped in environmentally sensitive areas such as wetlands.
- No storage of fuels or chemicals or refueling of vehicles or equipment would occur in environmentally sensitive areas including the upland forest areas or wetland sites.
- The contractor would be required to carry a spill control kit at all times should a spill of a hazardous material occur or if there is a vehicle or equipment leak. The spill kit would include absorbent material, clamps and plugs for leaks, a sturdy catch basin for leaks, digging tools, and tarps to protect soil during repair jobs.
- Any dragging of logs or further disturbance to soils following felling operations would be minimized to the maximum practical extent to reduce impacts to surrounding natural resources.
- Where feasible, equipment modifications would be used in the wetland sites to reduce potential impacts to soils, such as rubberized tracks, use of low ground pressure equipment, and use of lightweight equipment.
- No equipment or vehicles would be parked or stored in wetlands at any time.
- The tree removal operations should occur during suitable ground moisture conditions in order to avoid excessive site damage. When avoidable, do not conduct tree removal in excessively wet weather.
- Vehicles and equipment would be shut off when not in use.
- Any areas temporarily impacted by the project such as access roads would be restored to their pre-project condition.
- Blades of mowing equipment would remain above the ground surface to reduce potential soil disturbances to the maximum extent practical.
- Dust minimization measures such as application of water to trails/roads or equivalent measures would be implemented as needed.

Best management practices that would be implemented to minimize noise effects would include the following:

- Clearing activities would occur during normal weekday business hours.
- Equipment mufflers would be properly maintained.
- Personnel or contractors conducting tree removal, cutting, topping and mowing operations would wear required Personal Protective Equipment at all times.
- Base personnel would be excluded from work zones during tree removal, cutting, and topping operations and mowing operations to ensure occupational safety and health risks to Base personnel are not increased from implementation of any of the action alternatives.

Permit Conditions

In addition to standard construction BMPs, additional standard mitigation measures for impacts to jurisdictional wetlands would be specified in the Clean Water Act, Section 404 Permit and the 401 Water Quality Certification. The permit and Water Quality Certification would require that the Proposed Action:

- Avoid wetland and water impacts where practicable;
- Minimize potential impacts to wetlands and waters; and
- Compensate for any remaining, unavoidable impacts to wetlands or waters.

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8 LIST OF PREPARERS

This report was prepared by the USACE, Norfolk District for and under the direction of the USAF. Technical staff that composed the EA and their relevant qualifications are listed below.

Table 8.1 List of preparers

| Name | Contribution/Education | Years of Experience |
|----------------|---|----------------------------|
| John Haynes | Cultural Resources/Master of Arts Degree, Anthropology | 28 |
| Alicia Logalbo | Environmental Analyst/Master of Science Degree, Biology | 18 |
| Jason O'Neal | GIS Mapping/Bachelor of Science Degree, Geology | 12 |
| Miranda Ryan | Environmental Analyst/Bachelor of Science Degree, Biology | 2 |
| David Schulte | Environmental Analysis/Master of Science Degree, Marine Science | 18 |

APPENDIX A

FELKER ARMY AIRFIELD QUALITY ASSURANCE EVALUATION REPORT

DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS,
VIRGINIA



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REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
2405 GUN SHED ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-1223

IMOP

MAY 30 2014

MEMORANDUM THRU Chief, Airspace, Ranges and Airfield Operations Division, Air
Combat Command (ACC), 205 Dodd Blvd, Ste 101, Langley AFB VA 23665-2789

FOR Commander, 1st Fighter Wing, 159 Sweeny Blvd, Ste 200, Langley AFB, VA 23665

SUBJECT: Joint Base Langley-Ft Eustis / Felker Army Airfield (AAF) Quality Assurance
Evaluation (QAE) Report

1. Headquarters Installation Management Command (IMCOM), G-3 Airfield Division conducted a QAE of Felker AAF, Joint-Base Langley-Ft Eustis, VA, 22 - 24 Apr 14. The team concluded the Airfield Division staff operates the airfield in a safe and effective manner and adequately supports the Senior Commander. The IMCOM QAE team identified 2 discrepancies and 22 findings. Of particular concern are the two discrepancies that require aggressive resolution actions to avoid any detrimental impact on flight safety, to include obstructions located in the graded area of the clear zones and the unauthorized modification of the aircraft refuel truck, dead-man switch. Of the findings identified, 7 were recurring from the previous evaluation. My team has enclosed the identified findings and recommendations.
2. Submit a consolidated corrective action plan addressing all discrepancies/finding to HQ ACC, A3 Airspace, Ranges and Airfield Operations Division. Include the status of findings in the Airfield Operations Board minutes. HQ IMCOM will provide assistance, as needed.
3. Point of contact is James Knight, 210-466-0299, james.c.knight3.civ@mail.mil.

Encl

for *Swartz*, DG3
ROBERT L. SHUCK
Colonel, GS
Director, G3

Summary: There were 2 discrepancies, 22 findings, and 3 satisfactory with comment identified during the Felker Army Airfield (AAF) evaluation. There were 7 findings recurring from the previous evaluation.

1. Discrepancies:

a. Discrepancy: Recurring Airfield Infrastructure: (AFI-004) Graded area of clear zones contain a roadway, trees, creeks and fences. (UFC 3-260-1, 3-11, Table 3-5)

(1) Discussion: There are roads as close as 350', trees within 200' more than 20 ft tall, steep slopes (grading), and Morrison's creek all located in the runway clear zones (Figure 1 & 2). Runway clear zones are areas on the ground, located at the ends of each runway (1000' x 3000'). Within the runway clear zone is the graded area (1000' x 1000') and it possess the highest potential for aircraft accidents, and requires no above ground intrusions and no abrupt surface changes. These areas have restricted uses and only certain Navigational Aids(NAVAIDS)/lights/signs are authorized. Any other unauthorized obstacles/hazards near the runway ends significantly increase the severity of an aircraft incident that may occur. The runways have existed for a long time and were built under different design criteria to meet the mission at that time. Unfortunately, the runways have been expanded beyond the capability of the existing terrain/airfield boundary to support. The greatest risk to aircraft is when landing short, overshooting the runway while on approach from the opposite direction, or during an aborted takeoff situation and unable to stop. The unmitigated hazards that are currently present create an increased high risk to aviation operations.



Figure 1. Runway 32 Graded Area Clear Zone Figure 2. Runway 14 Graded Area Clear Zone

(2) Recommendation: Take the following actions:

(a) Immediately publish a NOTAM and submit a change to FLIP or local procedures identifying the trees and approximate heights in close proximity to rwy.

(b) Immediately establish a workgroup that includes Felker AAF and ABW Staff, (Airfields, ATC, AT&A, CE, OSS, and Environmental) and assigned aviation units to analyze situation, determine impacts, and develop a plan with course of actions (COAs) to permanently displace/relocate the approach threshold, recalculate runway lengths and departure ends of each runway and/or obtain waivers to criteria.

(c) Conduct risk management on each runway end and determine/document mitigation requirements.

(d) Establish Landing Distance Available (LDA) and Take-Off Distance Available (TORA) to account for the obstructions in the clear zones.

(e) If determined necessary, apply for applicable waivers to airfield design criteria.

(f) As necessary, coordinate with both HQ ACC (A3 and A7) and HQ IMCOM (G3), on proposed actions.

b. Discrepancy: **Recurring** (ACR-075) Aircraft refueling is not conducted in proper sequence to ensure safety. (NFPA 407, para 5.15.2)

(1) Discussion: Along-side aircraft refueling was conducted with one operator at the nozzle and no operator controlling the dead man control valve. The dead man control valve had been manipulated to stay in the “flow” position when the truck was engaged to pump fuel. NFPA 407 does not allow any manipulation of the dead man valve as this is a safety violation that could lead to catastrophic incident during a refuel operation.

(2) Recommendation: Do not conduct any refueling operations that the dead man control valve is not in the control of a trained fuels operator. Vehicle refuelers must be placed back into original manufacture condition so proper sequencing for aircraft refueling can be done safely. In addition, ensure proper sequencing for fuel operations is added to standing operating procedures for aviation refueling.

2. Airfield Operations and Services (AOS)

a. Finding: **Recurring** (AOS-012) The Airfield Operations Board is conducted, but no minutes are produced. (IMCOM Suppl 1 to AR 95-2, addition to pg 48, para 13-11)

(1) Discussion: During the quarterly Langley-Eustis AOB the Felker AAF Airfield Division Chief provided briefings; however the minutes do not include the information he provided to AOB chair and members. During the visit the QAE Team Chief discussed this issue with the HQ ACC Airfield Operations Division and all parties agreed the AOB minutes must include all information presented during the AOB for both airfields.

(2) Recommendation: Include Felker AAF airfield/ATC information in the next AOB minutes.

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b. Finding: (AOS-014 and AOS-016) Not all required items are accurate in the local Airfield Operations Manual (AOM). (AR 95-2, para 13-3, 13-2.c(8), 13-3.h(5); FM 3-04.300, para 9-4, 9-7, and 9-13; IMCOM Suppl 1 to AR 95-2, addition to pg 44, 45, para 13-2.c(17) (30); addition to pg 45, para 13-3; addition to pg 48, para 13-8 and Appendix L)

(1) Discussion: The runway lengths indicated on the airfield diagrams in the AOM were not the same as indicated in the IFR Supplement/Airfield Obstruction Survey. The airfield's aircraft fire/crash rescue response capabilities are not clearly documented in the AOM. The AOM must include procedures/restrictions to be implemented when Fire and Emergency Services (F&ES) vehicle/personnel reductions could impact the ability to respond to airfield emergencies. Procedures must include the notification to all airfield users. Current procedures included only a requirement for the Tower to notify pilots and Base Ops. At a minimum a NOTAM should be transmitted and local aviation tenants and frequent users of the airfield should be notified to ensure they can take appropriate action prior to takeoff/landing. Advance notification can prevent unnecessary preparations and flights when the airfield is unusable or unable to support aircraft due to reduced F&ES capability.

(2) Recommendation: Conduct a thorough review of the AOM and appropriate source guidance to ensure all required items are addressed and information and procedures are correct, clearly written, and comprehensive.

c. Finding: (AOS-015) Civil Aircraft Landing Permits (CALP) not sent to USAASA. (AR 95-2, para 1-20.a.(5))

(1) Discussion: There were two CALPs that were not sent to U. S. Army Aeronautical Services Agency (USAASA). While the airfield falls under the Air Force management, according to the MOA, the CALP program is regulated by Army regulation, AR 95-2. Thus the CALPs must be sent to USAASA.

(2) Recommendation: Send all approved CALPs to USAASA.

d. Finding: (AOS-024) Airfield inspection checklist is missing required information. (AR 95-2, para 13-2c(9-10) & Appendix D)

(1) Discussion: The checklist being used to conduct airfield inspections did not include a requirement to inspect the helipad for design criteria, marking and lighting requirements.

(2) Recommendation: Add the helipad design criteria, markings and lighting to the airfield inspection checklist.

e. Finding: (AOS-032) Training records did not indicate all personnel performing airfield inspections are trained on all requirements. (AR 95-2, para 13-8)

(1) Discussion: A review of the training program indicated not all personnel performing airfield inspections were trained on airfield design criteria, signs, marking and lighting requirements.

(2) Recommendation: Immediately provide training on airfield criteria to all personnel performing airfield inspections/checks. Ensure training is documented in the individuals training records. Maintain the training documentation for the duration of the individual's employment at Felker AAF. Update as required.

f. Finding: (AOS-Off-Checklist Finding (OCF)-001) Pavement condition index (PCI) below requirements. (DA PAM 420-1-3, chap 3, para 2.a)

(1) Discussion: This item is normally included in the Army DPW checklist (DPW-003). The results at Eustis AAF Airfield Pavement Condition Survey conducted September 2011 indicated the Main Apron does not meet the PCI standard of 55 for secondary taxiways and aprons. A project is scheduled to repair the area within the next two years.

(2) Recommendation: Fund and repair the main apron. Ensure the apron boundary markings are repainted a minimum of 75 ft from obstructions and taxi lines allow for the safe taxiing of rotary-wing aircraft.

g. Off-Checklist Finding: (AOS-OCF-002) Primary pavement not structurally capable of supporting the mission aircraft. (AR 420-1 chapter 7, para 9 a & b)

(1) Discussion: This item is normally included in the Army DPW checklist (DPW-004). Portions of Alpha Taxiway, Main ramp, Utility Ramp and Cargo ramp are not structurally adequate to support the mission Aircraft Classification Number (ACN).

(2) Recommendation: Program and fund a project for the full depth repair of these pavement segments that will structurally improve these features. Continue to submit work orders to provide structural repairs to the failed pavements areas.

3. Airfield Infrastructure (AFI)

a. Finding: **Recurring** (AFI-001) Objects in the runway lateral clearance and mandatory frangibility zone. (UFC 3-260-01, Table 3-2, Items 12 and 17)

(1) Discussion: There are trees, the security fence and dumpsters within the runway lateral clearance. Portions of the fence and the trees are also within the mandatory frangibility zone (MFZ). Even though there is a waiver for the fence with the runway lateral clearance, there is no waiver for the fence to be within the MFZ. Additionally, the lateral waiver requires the fence be frangible which requires the fence be designed using materials of minimum mass that will either break into segments or

shatter without impaling the aircraft skin or becoming an obstacle to the continued movement of the aircraft. The statement “the fence, although frangible, will have a slowing effect on an aircraft and should be taken into consideration as to the impact of subsequent obstacles” was included in recent waiver submissions for Felker AAF, implies the fence is not frangible. There are additional concerns with the waiver and are highlighted under AFI-033.

(2) Recommendation: Relocate dumpsters outside runway lateral clearance and remove trees within lateral clearance. Evaluate frangibility of fence to ensure it meets all of the frangibility requirements.

b. Finding: (AFI-011) Threshold lights are below the runway elevation and are not visible when approaching the end of the runway. (UFC 3-535-01, chap 4)

(1) Discussion: Threshold lights are not on an equal plane. The outer lights are much lower than the inner lights at both ends of the runway. Photos from previous evaluations indicate the ground is sinking in those areas.

(2) Recommendation: Determine future effects of ground sinking in these areas and take actions to elevate lights on equal plane with the lights on the runway.

c. Finding: (AFI-025) Taxiway markings improperly configured. (ECB 2012-28, ETL 04-02, para 7 and figure 9)

(1) Discussion: VFR runway holding position lines do not extend through shoulder on Taxiway A. Also, the taxiway centerline should break 3 feet from the holding position lines. In all cases, the centerlines do not have the required 3 feet break. VFR runway holding position markings on Taxiway A are 290 feet from the runway edge. They should be located 100 to 250 feet from the runway edge.

(2) Recommendation: Extend holding position markings through the shoulder and remove taxiway centerline markings within 3 feet of holding position markings.

d. Finding: (AFI-026) Taxiway edge lighting improperly configured and missing entry/exit lights. (UFC 3-535-01, paras 5-1.2.1, 5-1.2.3 and 5-1.2.4 and Figures 5-1 and 5-3)

(1) Discussion: Taxiway entrance/exit lights are visual cues to let pilots know they are moving from a runway/apron onto a taxiway. There are no entrance/exit lights on Taxiway A. The problem is compounded by taxiway edge lights on one side extending onto the apron/taxilane. There is no way to know when an aircraft has entered the taxiway. Companion lights should be placed on the opposite side of the taxiway (i.e. lights should match up on both sides). One set of lights on Taxiway A do not match up.

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(2) Recommendation: Remove the edge light from the apron/taxilane area. Install entry/exit lights. Align lines on both edges of taxiway with no more than 100 feet between lights.

e. Finding: (AFI-028) VIP apron markings are not in compliance. (ECB 2012-28, AFI 32-1042, 5.5; ETL 04-2, para 7.3)

(1) Discussion: The VIP apron has a fence on the boundary of the apron. The boundary marking that exists is a single white line. Additionally, there is a vehicle parking spot (non-standard marking) on the apron. Apron boundary lines are double yellow lines. The boundary must be 75 feet (rotary wing aprons) from the nearest obstacle. The fence is not a permissible deviation.

(2) Recommendation: Paint a double yellow line across the apron 75' from the fence. Paint double yellow lines on the edges of the apron. Paint a broken double yellow line on the runway side of the apron. A lane for vehicles may be painted outside the apron boundary using white paint.

f. Finding: (AFI-032) Helipad does not have a wind cone. (UFC 3-535-01, table 2-2.2 and para 10-2)

(1) Discussion: Wind indicators (cones) are required for helipads. Wind cones near landing facilities (e.g. helipads/runways) enhance operational capabilities, increase safety and reduce pilot workload during approach, hover and takeoff operations. However, it would be unreasonable to install a separate wind cone for every helipad (on some airfields). In some cases, a wind cone installed near a runway would provide sufficient coverage for one or more nearby helipads. Likewise, a single wind cone may provide coverage for multiple helipads. Felker AAF has a wind cone located near the fixed wing runway over 2400' from the helipad and there are numerous buildings between them. Even if the wind cone was visible from the helipad (it is not), the winds indicated by the wind cone may not be representative of the winds at the helipad. There is also a wind sock installed on a hangar but it also may not be reflective of the winds at ground level.

(2) Recommendation: Install a wind cone near the helipad, but outside imaginary surfaces, that is free from the effects of air flow disturbances caused by nearby objects or rotor wash. It must be visible from a helicopter in flight, in a hover, or on the movement area.

g. Finding: **Recurring** (AFI-033) Waivers are not on file for all areas not in compliance with criteria. (UFC 3-260-01 para 1-8 & Appendix B, Section 1 & AR 95-2, para 13-3.e)

(1) Discussion: In addition to the deficiencies above that do not have waivers, all of the waivers on file were justified using the Sherpa's capabilities. There are zero

Sherpas currently operating/assigned at Felker. A mission change to the Super King Air (350) necessitates analysis of the existing waivers to determine if the justification based on the Sherpa is sufficient to mitigate risk from non-compliant conditions.

(2) Recommendation: Evaluate all existing waivers to determine the impact of the mission change. If necessary, submit new waiver package(s) based on the Super King Air.

h. Satisfactory with Comment: Runway length. (UFC 3-260-1, 3-8, Table 3-2)

(1) Discussion: The runway is much shorter than the minimum recommended length for a fixed wing runway. The runway does not have sufficient clear zones or overruns. The runway was constructed under previous criteria but must be evaluated to determine the effect of mission changes (most recent change was from Sherpa to the Super King Air 350). A Super King Air 350 is operating at the edge of its operating capabilities on Felker AAF. The lack of overruns and clear zones greatly increases the risk to the aircraft and crew/passengers if the aircraft departs the landing surface.

(2) Recommendation: Ensure units operating fixed wing aircraft at Felker AAF understand the risk to their aircraft in the event of an overrun/undershoot. Evaluate existing waivers and non-compliant areas to determine risk to fixed wing aircraft operating on Felker.

i. Satisfactory with Comment: Compass rose used as landing surface. (UFC 3-260-01, para 6-11; Appendix B, Section 10, and Table 4-2)

(1) Discussion: The compass rose is located on an apron which has been designated a movement area. Aprons may be designated as movement areas. However, the compass rose is often utilized as a landing area (i.e. helipad). The design/safety criteria for a helipad are different than the criteria for an apron. If the compass rose apron were a helipad, the trees immediately adjacent to the compass rose would violate the clear zone and other imaginary surfaces. While technically legal to land to and takeoff from other areas by rotary-wing aircraft, safety dictates ceasing those operations until the trees are removed. If more areas are needed to land rotary-wing aircraft recommend adding multiple helipads, hoverpoints, or runways rotary-wing runways in excess of 240 m (800 ft) long, and/or Landing lane(s).

(2) Recommendation: Cease landing and takeoff operations to/from the compass rose until trees that would violate helipad criteria are removed. If able, add helipads and/or hoverpoints on the airfield.

4. Airfield Safety (ASP)

a. Satisfactory w/Comment: (ASP-012) The Felker AAF safety awards program needs to be redesigned for the civilian workforce. (PAM 385-90, para 1-4.m(6)(q) and 2-5)

(1) Discussion: The Airfield Safety awards program is in accordance with all applicable Army regulations and policies, but the program needs to be redesigned for the civilian workforce. According to the awards safety log only 2 safety awards were presented for FY 2013.

(2) Recommendation: DA Pam 385-10 allows leaders at all levels to recognize safe performance displayed by individuals within their organization. Leaders are also encouraged to develop awards that are tailored to recognize the accident prevention accomplishments within their sphere of activity, interest, or operation.

5. Aircraft Refueling (ACR)

a. Finding: **Recurring** (ACR-001) Standard Operating Procedures do not detail specific procedures and steps to ensure procedural consistency for all actions required of fuel personnel. (AR 710-2, para 2-37b)

(1) Discussion: (1) Discussion: The Standard Operating Procedures (SOP) for Felker AAF fuels personnel are listed in abbreviated format in the Airfield AOM. Generic instructions for all of the procedural requirements to safely operate a bulk fuel point and issue aviation grade fuel to aircraft must be specific to listed regulatory procedures and detail all responsibilities for each and every worker performing the fuels mission. The SOP must be fully developed in order for the training program to be developed that will support all required fuel operations.

(2) Recommendation: Ensure all applicable checklist requirements and installation requirements are listed in the SOP and for each requirement, all procedures and instructions from applicable directives is listed in the SOP. Fuel operations are dangerous in nature and no instructions shall be abbreviated or edited for simplicity without the approval of the authority having jurisdiction of the Airfield mission. Sample SOPs were provided the fuels leader to assist in updating of the operational SOP.

b. Finding: (ACR-002) The training program does not have sufficient detail for initial and refresher training and for the required checklist subjects. (FM 10-67-1, pg 2-1; FM 7-0, para 2-4)

(1) Discussion: Aircraft refueling personnel have a myriad of training classes and certificates on file but no established program to delineate between initial and refresher training. Nor does the training program encompass all required checklist subjects as required.

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(2) Recommendation: Fuels leader shall establish specific training for each subject and additionally detail in the training program what quantifies trained to be able to conduct fuel operations and what entails refresher training for all employees once the initial training is completed.

c. Finding: (ACR-023) Meters on vehicles and in the bulk facility are not calibrated within 12 months. (AR 710-2, para 4-28)

(1) Discussion: Meters used in the sale of fuel from one organization to another must be calibrated to ensure the accuracy of inventory records. Extensive periods of use without calibration could lead to out of tolerance inventory reconciliations and even lead to a financial liability investigation against the responsible officer.

(2) Recommendation: Fuel leader shall submit a service order to the recurring maintenance quality assurance evaluator to have the meters calibrated as soon as possible and then programmed for annual calibration.

d. Finding: (ACR-033) Facility and vehicle filter separators are not marked with in-service date for filter elements. (FM 10-67-1, pg 13-4)

(1) Discussion: Facility filter separator were observed to have markings for when filter elements were placed into service and others marked for when next normal expected filter change should be due, but not both. Stenciling the expected due date on vertical filter separators in addition to the in service date is authorized IAW UFC 3-460-03 but this should be detailed in the SOP.

(2) Recommendation: To ensure consistency across the board, all filter separators should be marked with the date the filter elements were placed into service and if the unit determines to list an expected due date in addition to in-service date, establish this procedure in the unit SOP.

e. Finding: (ACR-050) Properly sized fire extinguishers were not available on aircraft refuelers as required. (NFPA 407, para 2.1.3)

(1) Discussion: Aircraft refueling vehicles were observed to not have two each minimum 20-B:C (20BC) fire extinguishers available for along-side aviation refueling. With lots of LUH-72 refueling it is important when two personnel are required for refueling that the appropriate sized fire extinguisher is available at the truck pump area and at the refueled aircraft nozzle area.

(2) Recommendation: Procure two each 20 pound fire extinguishers for each refueling vehicle and until the proper sized fire extinguishers are provided, an additional operator is necessary to operate the 150 pound wheeled fire extinguishers located near each helipad used for refueling to ensure a safe operation.

f. Finding: **Recurring** (ACR-051) Above Ground storage tanks not properly painted and marked. (UFC 3-460-01, pg 29)

(1) Discussion: Above ground storage tanks shall be marked to identify the product name, capacity, applicable hazard markings, banding, etc. as required. Currently, the Felker bulk storage tanks are only marked on one side and the lettering is faded and blistering off the tank. These markings should be clearly visible from multiple sides to all personnel (facility/fire/safety) whom may use or need access to this facility for any purpose.

(2) Recommendation: Fuel Manager shall submit a service order through the base civil engineer office for input into the DLA Energy funded recurring maintenance program to ensure tank markings are applied as required by UFC 3-460-01 and MIL-STD-161. Inspection of this requirement should be added to normal operating procedures.

g. Finding: (ACR-053) Bulk Facility equipment and components not being inspected/maintained nor documentation exists for periodic inspections and recurring maintenance. (UFC 3-460-01, chap 8)

(1) Discussion: Numerous deficiencies were observed within the fuel facility; cracks in berms, corroded pressure relief valves, above ground storage tanks not marked, no small tank inspection documentation, or underground pipeline line testing. With no recurring checks and services on this equipment the likelihood for failure increases each year the facility is not checked for compliance and safety of operations.

(2) Recommendation: Fuels team leader needs to follow up with 633rd Mission Support Group (MSG) and 733rd Mission Support Group (MSG) Civil Engineering (CE) sections to ensure follow up with Air Force Petroleum Agency and DLA Energy to add the Felker Army Airfield fuel facility to the DLA funded recurring maintenance program managed by the United States Army Corps of Engineers (USACE) Huntsville district. This will ensure quarterly inspections of facilities for compliance with applicable publications and repair work to follow inspections. In addition, the 733rd MSG CE and the USACE-Huntsville has agreed to process current findings from this inspection as service orders to ensure these deficiencies are addressed as soon as possible.

6. Commendable: Airfield Construction Safety Phasing Plan template.

Discussion: Establishing and maintaining a safety culture during construction projects is difficult at best. Since safety must not be compromised, the airfield management must strike a balance between maintaining aircraft operations and construction costs. This balance will require early coordination with contractors and tenant units. The result of this coordination is the project Construction Safety and Phasing Plan (CSPP). Development and management of the CSPP will be imperative to the success of a construction project. Felker AAF leadership has created a solid and responsive safety

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atmosphere, which promotes safety procedures, accident prevention, and composite risk management. The CSPP template that they developed is very structured, comprehensive and inclusive for contractors, tenants, and airfield employees. I would consider this CSPP template as a “Best Practice” for all of IMCOM airfields.

Team Member Contacts

| Function | Name | Number | Email |
|------------------------------------|-------------------|----------------|--|
| Team Chief/ Airfield Operations | James Knight | 210-466-0299 | James.c.knight3.civ@mail.mil |
| Airfield Infrastructure | Dave McCormick | 210-466-0298 | William.d.mccormick6.civ@mail.mil |
| Airfield Safety | Anthony Greer | 210-466-0210 | Edward.a.greer4.civ@mail.mil |
| Aircraft Refueling (APC) | Gary Parsons | 703-767-1779 | Gary.parsons@dla.mil |
| Observer | Hector Bosques | (703) 806-4871 | Hector.bosques.civ@mail.mil |

APPENDIX B

**COASTAL ZONE MANAGEMENT ACT
FEDERAL CONSISTENCY
DETERMINATION
FOR MANAGEMENT OF VEGETATION
AIRFIELD CLEARANCES AT FELKER
ARMY AIRFIELD**

**DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS,
VIRGINIA**



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**COASTAL ZONE MANAGEMENT ACT
FEDERAL CONSISTENCY DETERMINATION**

**MANAGEMENT OF VEGETATION AIRFIELD CLEARANCES
AT FELKER ARMY AIRFIELD**

**DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS, VIRGINIA**



DECEMBER 1, 2017

CONSISTENCY REVIEW: Information to support this Federal Consistency Determination (including maps and additional supporting information) can be found in the accompanying *Environmental Assessment for Management of Vegetation Airfield Clearances at Felker Army Airfield*, dated 1 December 2017.

PROJECT DESCRIPTION: *Purpose.* Vegetation composition and heights have not been maintained in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning Design (UFC) 3-260-01* at the Felker Army Airfield that is located at the Joint Base Langley Eustis-Fort Eustis (JBLE-Eustis).

The purpose of the Proposed Action is to attain and maintain vegetation clearances within the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area adjacent to the Clear Zone at the Felker Army Airfield, JBLE-Eustis that provide the adequate margins of safety for aircraft take-offs and landings in accordance with the UFC 3-260-01 to the maximum, practical extent.

Alternatives Screening and the Preferred Alternative. An initial screening of project alternatives was conducted to determine how six project alternatives would impact flight-based training missions supported by the airfield that was then followed by a more detailed screening of alternatives. During the initial screening, two alternatives were eliminated from further consideration as they would both cause substantive, negative impacts to flight missions currently supported by the airfield. Following the initial screening of alternatives, additional criteria were used to evaluate and compare project alternatives. Alternative 3, *Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Topping in Clear Zone 2 and Clear Zone 3*, was selected as the Preferred Alternative because it adequately met the purpose and need of the project while minimizing impacts to natural resources and land-based training operations as compared to the other action alternatives.

Description of the Preferred Alternative (Alternative 3). Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01 except in emergent wetlands. Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees will be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing will be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) within seven days of the final soil grading. Soil testing will be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01. Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

In Clear Zone 2, trees would be topped in accordance with the UFC 3-260-01. Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 18 feet to 43 feet in the Clear Zone 2. In Clear Zone 3, trees would also be topped in accordance with the UFC 3-260-01. Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Vegetation management operations within the Primary Surface and the clear zones will be controlled in accordance forestry and stormwater Best Management Practices (BMPs) to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs will be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down or topped would either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation will be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface will be maintained as herbaceous vegetation, not to exceed eight inches in height (except in emergent wetlands). Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights will be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Over time, as additional trees penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone, they would then be topped and treated in accordance with integrated pest management practices to prevent re-growth of the trees over time. Vegetation will continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

PROPERTY CLASSIFICATION: The JBLE-Eustis is owned and operated by the Department of Defense and is located approximately 160 miles south-southeast of Washington, D.C., 60 miles southeast of Richmond, 10 miles southeast of Williamsburg, and 30 miles northwest of Norfolk. The JBLE-Eustis is located in the Hampton Roads area of Southeast Virginia on the southwest side of the Virginia Peninsula, bordered by the James River and Warwick River. The installation is within the City of Newport News and is located on the eastern shoreline of the James River, approximately 30 miles upstream of its confluence with the Chesapeake Bay. It is bordered on the west and south by the James River; and on the east by the Warwick River, which separates JBLE-Eustis from civilian residential areas in the City of Newport News.

Mulberry Island (approximately 5,400 acres) is an adjacent peninsula separated from the main installation by a drainage way from the James River to Warwick River. It is used primarily for military field training purposes, but does include some infrastructure including the Pines Golf Course and Felker Army Airfield. Felker Army Airfield is located outside of the cantonment area, west of the Pines Golf Course (which is also west of the cantonment area) on Mulberry Island. The airfield, including its associated infrastructure, is the main developed area on Mulberry Island.

Fort Eustis is a joint base installation that was reorganized as JBLE-Eustis with Langley Air Force Base in 2010 in accordance with the Base Realignment and Closure 2005. Major tenant organizations at JBLE-Eustis include the 7th Transportation Brigade (Expeditionary), 128th Aviation Brigade, Headquarters Training and Doctrine Command, U.S. Army Applied Aviation Technology Directorate, Joint Task Force–Civil Support, and the Maritime & Intermodal Training Department of the U.S. Army Transportation School.

The JBLE-Eustis is a 7,869-acre facility primarily associated with logistics and transportation training. Most of JBLE-Eustis is used primarily for military training purposes. Mulberry Island, the mostly undeveloped portion of JBLE-Eustis that is used for training, also borders the Warwick River on its north side, making JBLE-Eustis a peninsula. Much of this area includes forested riparian and wetland habitat, tidal wetlands, non-tidal wetlands, and upland forested and early successional habitat. Numerous tidal creeks are also present.

The Felker Army Airfield contains a 3,020-foot-long by 75-foot-wide asphalt runway. It services various military rotor-wing aircraft and small to mid-sized fixed-wing aircraft for the Department of Defense (DoD). The number of aircraft using the airfield daily varies. Certain aircraft are permanently stationed at the airfield as part of mission requirements, while other aircraft utilize the airfield for training purposes or are transient. Both day and night operations take place with an average over 500 movements daily (Musser Personal Communication 2017).

IMPACTS TO RESOURCES/USES OF THE COASTAL ZONE: See Summaries below.

DETERMINATION: Based upon evaluation of impacts analyzed in the Environmental Assessment and in accordance with Section 307 of the Coastal Zone Management Act (CZMA) and the CZMA Federal Consistency Regulation—15 C.F.R. Part 930, the U.S. Air Force (USAF) determined that the proposed project would be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the Commonwealth of Virginia’s Coastal Zone Management Program.

Enforceable Policies

Enforceable policies of the Virginia Coastal Zone Management Program and their applicability to the *Management of Vegetation Airfield Clearances at Felker Army Airfield Preferred Alternative* (Alternative 3) are described below (A-I).

A. Fisheries Management

The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Virginia Marine Resources Commission (VMRC) (Virginia Code §28.2-200 through §28.2-713) and the Virginia Department of Game and Inland Fisheries (VDGIF) (Virginia Code §29.1-100 through §29.1-570).

This project would not impact fisheries; therefore, adherence to this policy would not be applicable.

B. Subaqueous Lands Management

The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects to marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Virginia Department of Environmental Quality (VDEQ) Water Quality Division. The program is administered by the VMRC (Virginia Code §28.2-1200 through §28.2-1213).

This project would not impact subaqueous lands; therefore, adherence to this policy would not be applicable.

C. Wetlands Management

The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation.

The tidal wetlands program is administered by the VMRC (Virginia Code §28.2-1301 through §28.2-1320).

The Virginia Water Protection Permit program administered by the VDEQ includes protection of wetlands -- both tidal and non-tidal. This program is authorized by Virginia Code § 62.1-44.15.5 and the Water Quality Certification requirements of §401 of the Clean Water Act of 1972.

The U.S. Army Corps of Engineers (USACE) conducted a wetland jurisdictional determination of the project area in May 2015. Tidal and non-tidal wetlands (Estuarine Emergent Wetland, Palustrine Emergent Wetlands, Palustrine Forested Wetland, and Palustrine Scrub/Scrub Wetlands) are found in the project area and there would be adverse impacts to wetlands with implementation of the Preferred Alternative. A Compensatory Wetland Mitigation Plan has been developed and all wetland impacts would be mitigated through purchasing of credits in an approved mitigation bank or in-lieu fee fund if no mitigation bank credits are available for purchase.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Wetlands Management Policy.

D. Dunes Management

Dune protection is carried out pursuant to the Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by the Marine Resources Commission (Virginia Code §28.2-1400 through §28.2-1420).

This project would not impact sand dunes; therefore, adherence to this policy would not be applicable.

E. Non-point Source Pollution Control

Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by VDEQ (Virginia Code §62.1-44.15:51 *et seq.*).

The use of stormwater management BMPs would prevent and mitigate potential short-term, adverse impacts to soils and surface water quality. Prior to construction, a Stormwater Pollution Prevention Plan approved by the VDEQ as authorized under the Virginia Stormwater Management Program (VSMP) Regulation (9VAC25-870) that includes erosion control practices, inspection procedures, and other BMPs would be required.

An erosion and sediment control plan compliant with Erosion and Sediment Control Regulations (9VAC25-840) that minimizes soil exposure and compaction during construction and controls stormwater discharges would be submitted to the VDEQ for review and approval. A Virginia Pollutant Discharge Elimination System (VPDES) General Construction Permit for this project would be obtained and a Storm Water Pollution Prevention Plan would be prepared for this project in accordance with the VPDES General Construction Permit.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Non-Point Source Pollution Control Policy.

F. Point Source Pollution Control

The point source program is administered by the State Water Control Board pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to §402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program. The Water Quality Certification requirements of §401 of the Clean Water Act of 1972 is administered under the Virginia Water Protection Permit program.

An individual VPDES permit would not be required for this project. State Water Quality Certification under Section 401 of the Clean Water Act required would be required from the VDEQ for this project.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Point Source Pollution Control Policy.

G. Shoreline Sanitation

The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Virginia Code §32.1-164 through §32.1-165).

This project involves no septic tanks; therefore, adherence to this policy would not be applicable.

H. Air Pollution Control

The program implements the Federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code §10.1-1300 through 10.1-1320).

The project would be located in the Air Quality Control Region 6 (AQCR 6) as defined in 9 VAC 5-20-200 as the Hampton Roads Intrastate Air Quality Control region. The Hampton Roads is currently designated as an attainment area for all National Ambient Air Quality Standards criteria pollutants.

The VDEQ (re)issued the Fort Eustis a Minor, Stationary Source Permit to Operate in August 2006. Existing stationary sources at the installation include: boilers, helicopter engine testing, marine engine testing, generators, a fuel pumping station, landfills, storage tanks, woodworking shops, paint booths, and abrasive bead blasting. Existing mobile and area sources of emissions at the installation include on- and non-road vehicles, rotorcraft, and fixed-wing aircraft.

Short-term, adverse impacts to air quality would be expected as a result of implementing the Preferred Alternative. The effects would be primarily from air emissions from gas or diesel fuel powered equipment during tree removal, cutting, and topping and mowing operations. Increases in emissions would not exceed applicability thresholds, be regionally significant, or contribute to any violation of a federal, State, or local air regulation. Increased emissions would not be anticipated to exceed *de minimus* thresholds. Greenhouse gas emissions resulting from operation of heavy equipment and mowing would remain well below 25,000 tons per year.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Air Pollution Control Policy.

I. Coastal Lands Management

The VDEQ Water Quality Division administers a state-local cooperative program with 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act (Virginia Code §§ 62.1-44.15:67 through 62.1-44.15:79) and Chesapeake Bay Preservation Area Designation and Management Regulations (Virginia Administrative Code 9 VAC 25-830-10 *et seq.*).

Impacts to wetlands would occur in Chesapeake Bay Preservation Area Resource Preservation Areas. A Wetland Mitigation Plan has been developed and all wetland impacts would be

mitigated through purchasing of credits in an approved mitigation bank or in-lieu fee fund if no mitigation bank credits are available for purchase.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Coastal Lands Policy to the maximum extent practical.

Advisory Policies for Geographic Area of Particular Concern

a. Coastal Natural Resource Areas

These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources: Wetlands, aquatic spawning, nursery, feeding grounds, coastal primary sand dunes, barrier islands, significant wildlife, habitat areas, public recreation areas, sand and gravel resources, and underwater historic sites.

The USACE conducted a wetland jurisdictional determination of the project area in May 2015. Tidal and non-tidal wetlands (Estuarine Emergent Wetland, Palustrine Emergent Wetlands, Palustrine Forested Wetland, and Palustrine Scrub/Scrub Wetlands) are found in the project area and there would be adverse impacts to wetlands with implementation of the Preferred Alternative. A Compensatory Wetland Mitigation Plan has been developed and all wetland impacts would be mitigated through purchasing of credits in an approved mitigation bank or in-lieu fee fund if no mitigation bank credits are available for purchase.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Coastal Natural Resource Areas Policy.

b. Coastal Natural Hazard Areas

This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are as follows: highly erodible areas, coastal high hazard areas, including floodplains.

Implementation of the Preferred Alternative would not result in any significant alternation in the hydrology and would not divert overland floodwater flow. Therefore, no significant flood hazard would be increased or would be created. Existing structures in the ROI that consist of

the supporting buildings and infrastructure for the Felker Army Airfield would not be at increased risk of flooding from implementation of any of the Action alternatives. Overall, there would be less than significant impacts to floodplain management.

Implementation of the Preferred Alternative (Alternative 3) would be in compliance with the Coastal Natural Hazard Areas Policy.

c. Waterfront Development Areas

These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are as follows: commercial ports, commercial fishing piers, and community waterfront.

There are no areas suitable for waterfront activities near this project; therefore, adherence to this policy would not be applicable.

Advisory Policies for Shorefront Access Planning and Protection

a. Virginia Public Beaches

Approximately 25 miles of public beaches are located in the cities, counties, and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas would be maintained to allow public access to recreational resources.

The project would not impact any Virginia public beaches; therefore, adherence to this policy would not be applicable.

b. Virginia Outdoors Plan (VOP)

Planning for coastal access is provided by the Virginia Department of Conservation and Recreation in cooperation with other state and local government agencies. The Virginia Outdoors Plan (VOP), which is published by the Department, identifies recreational facilities in the Commonwealth that provide recreational access. The VOP also serves to identify future needs of the Commonwealth in relation to the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.

There are no recreational facilities located in the project area; therefore, adherence to this policy would not be applicable.

c. Parks, Natural Areas, and Wildlife Management Areas

Parks, wildlife management areas, and natural areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state, and federal agencies. The recreational values of these areas should be protected and maintained.

There are no parks, natural areas or wildlife management areas located within the project area; therefore, adherence to this policy would not be applicable.

d. Waterfront Recreational Land Acquisitions

It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.

The project is located on military lands owned by the Department of Defense; therefore, adherence to this policy would not be applicable.

e. Waterfront Recreational Facilities

This policy applies to the provision of boat ramps, public landings, and bridges which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.

This project does not involve the design, construction, or maintenance of any boat ramps, public landings, or bridges; therefore, adherence to this policy would not be applicable.

g. Waterfront Historic Properties

The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic waterfront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, and/or archaeological interest are significant resources for the citizens of the Commonwealth. It is the policy of the Commonwealth and the Virginia CZM Program to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when practicable.

No waterfront historic properties would be affected by implementation of the project; therefore, adherence to this policy would not be applicable.

Determination

Based upon the following information, data, and analyses, the USAF, finds that the Preferred Alternative (Alternative 3) for the *Management of Vegetation Airfield Clearances at Felker Army Airfield Project* would be consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Zone Management Program.

Pursuant to 15 CFR Section 930.41, the Virginia Coastal Resources Management Program has 60 days from receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension under CFR section 930.41 (b). Virginia's concurrence will be presumed if its response is not received by the USAF on the 60th day from receipt of this determination.

Approved by:

David F. Kattler, Colonel, USAF
Chief, Civil Engineering Division

DATE

APPENDIX C

AGENCY, PUBLIC, AND TRIBAL COORDINATION

DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS,
VIRGINIA



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DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

December 1, 2017

Ms. Barbara Rudnick, NEPA Team Leader
Environmental Impact Review and Long Range Priorities Program
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

RE: Response to U.S. Environmental Protection Agency Comments to the Final Draft
Environmental Assessment for the Management of Vegetation Airfield Clearances at Felker
Army Airfield

Dear Ms. Rudnick,

Thank you for providing the U.S. Environmental Protection Agency's (USEPA) comments to the Final Draft Environmental Assessment (EA) for the Management of Vegetation Airfield Clearances at Felker Army Airfield, located at the Joint Base Langley Eustis-Fort Eustis, Virginia. All comments have been addressed and Enclosure 1 contains our detailed responses to comments that were provided in the letter received October 12, 2017 from Ms. Alaina McCurdy, USEPA to Ms. Tracey Sugg, U.S. Army 733rd Mission Support Group. Addressing the comments has improved the EA content and we greatly appreciate the technical expertise that were provided during the USEPA's review of the EA. If you have any questions or would like to discuss further, please do not hesitate to contact me via telephone (757-201-7210) or email (Alicia.Logalbo@usace.army.mil). We look forward to our continued coordination on the project. Thank you for the USEPA's review of the Draft EA.

Sincerely,

A handwritten signature in black ink, appearing to read "Alicia Logalbo".

Alicia Logalbo
Chief, Environmental Analysis Section
U.S. Army Corps of Engineers, Norfolk District

Enclosures:

Enclosure 1 – Response to U.S. Environmental Protection Agency Comments to the Final Draft
Environmental Assessment for the Management of Vegetation Airfield Clearances at Felker
Army Airfield

cc: Ms. Tracey Sugg, U.S. Army 733rd Mission Support Group



DEPARTMENT OF THE ARMY
 US ARMY CORPS OF ENGINEERS
 NORFOLK DISTRICT
 FORT NORFOLK
 803 FRONT STREET
 NORFOLK VA 23510-1011

Enclosure 1 – Response to Environmental Protection Agency Comments to the Draft Environmental Assessment Management of Vegetation Airfield Clearance at Felker Army Airfield

| Comment | Response | Resolved? |
|--|---|------------|
| <p>While the EA states that there are no hazardous sites within the Region of Influence (ROI), it is recommended that CERCLA sites near the airfield be identified and discussed in terms of cleanup status and potential impacts from/to the Proposed Action. Including sites near the airfield that may be outside the ROI should be considered in the cumulative impact analysis.</p> | <p>The ROI is the area of potential impact for any of the project alternatives in the EA. We have confirmed with Base personnel that there are no potential CERCLA sites in the ROI and therefore, there would be no potential direct or indirect impacts with implementation of the Preferred Alternative. We would not anticipate the implementation of the Preferred Alternative to affect any CERCLA actions outside of the ROI either.</p> | <p>Yes</p> |
| <p>We recommend that impacts to water resources also consider potential impacts to impaired waterbodies. If there are impaired waters that maybe indirectly impacted by additional clearing upstream, perhaps compensatory mitigation considered for the proposed action could be located along this reach.</p> | <p>Any potential impacts to downstream waterbodies would be mitigated by implementation of stormwater and forestry Best Management Practices as is described in Section 6, <i>Special Procedures</i> of the Final Draft EA. Therefore, no compensatory mitigation for any downstream waterbodies is required.</p> | <p>Yes</p> |
| <p>Please clarify if flood elevation is expected to raise or be unaffected by the proposed clearing activities in the primary surface, CZ1 and approach departure clearance surfaces. If the flood elevation may be affected, we recommend this impact be considered and addressed appropriately.</p> | <p>Implementation of the Preferred Alternative would only result in temporary negligible impacts to the floodplains, (evaluated in the floodplain section of EA). Denuded areas would be seeded within one week, further mitigating impacts to the floodplains. This impact is discussed and evaluated in the Floodplains Section, Section 4.4, <i>Water Resources, Floodplains</i> of the Final Draft EA.</p> | <p>Yes</p> |

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| <p>Pg. 4-15 states that a LIDAR analysis would be done every five years to assess tree heights in Zone 3 and remove additional trees in the CZ3 that would require topping. Please clarify if this analysis will also be completed for CZ2, as these zones within Alternative 3 are receiving the same vegetation treatment. We suggest that maintenance associated with Alternative 3 be clarified. Additionally, maintenance should be considered within the cumulative impact analysis.</p> | <p>Concur. The text has been updated to address this comment.</p> | <p>Yes</p> |
| <p>The EA considers forest systems within the ROI. IT is recommended that these functions be considered in any compensatory mitigation developed for both forested wetlands and upland forests. Among these functions, you may consider the functions performed as a carbon sink, and ways to incorporate this concept into any mitigation for lost resources.</p> | <p>We currently do not have an approved mitigation functional assessment tool to evaluate carbon sink functions of uplands and wetlands. We do not have the opportunity to do on-site compensatory mitigation due to the nature of the missions of JBLE-Eustis and we are currently unable to purchase upland mitigation credits. Therefore, additional wetland mitigation is being done to help offset impacts to Resource Protection Areas to the maximum, extent practical. Even if a functional assessment was done and indicated that less wetland mitigation was needed as compared to the standard mitigation ratios, we would still have to defer to the standard wetland mitigation ratios to obtain the required Clean Water Act, 404 Permit from the USACE and the 401 Water Quality Certification from the Virginia Department of Environmental Quality. Therefore, we opted not to perform a wetland functional assessment. Also, a standardized wetland functional assessment tool has not yet been approved by the USACE, Norfolk District Regulatory Division.</p> | <p>Yes</p> |
| <p>Appendix E describes the wetland mitigation plan for the proposed action, which seeks to purchase wetland compensatory mitigation credits from an approved wetland mitigation bank. It is recommended that the size, function, and value of impacted wetlands be considered in order to develop a compensatory mitigation plan. In addition to this, we recommend considering potential opportunities on the base for forested wetland and upland impacts as well as other forest functions.</p> | <p>We currently do not have an approved mitigation functional assessment tool to evaluate carbon sink functions of uplands and wetlands. We do not have the opportunity to do on-site compensatory mitigation due to the nature of the missions of JBLE-Eustis and we are currently unable to purchase upland mitigation credits. Therefore, additional wetland mitigation is being done to help offset impacts to Resource Protection Areas to the maximum, extent practical. Even if a functional assessment was done and indicated that less wetland mitigation was needed as compared to the standard mitigation ratios, we would still have to defer to the standard wetland mitigation ratios to obtain the required Clean Water Act, 404 Permit from the USACE and the 401 Water Quality Certification from the Virginia Department of Environmental Quality. Therefore, we opted not to perform a wetland functional assessment. Also, a standardized wetland functional assessment tool has not yet been approved by the USACE, Norfolk District Regulatory Division.</p> | <p>Yes</p> |
| <p>The EA states that cumulative impact analysis considers past and reasonably foreseeable future projects with the potential to contribute to cumulative impacts of the proposed action. However, it does not</p> | <p>Concur, however, we could not locate additional information regarding the history of the Felker Army Airfield beyond that which is already</p> | <p>Yes</p> |

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| <p>appear that the analysis includes a full suite of past actions. We recommend for a more complete, robust analysis of the temporal scope of past actions be defined to include the development of the airfield. This may provide a fuller cumulative impact analysis of forest, habitat, and wetland impacts within the ROI.</p> | <p>presented in the Final Draft EA. We worked with the Base Museum but they were unable to locate additional information on the development of the airfield. Please note based on the best available information we compiled the history of the development of the Felker Army Airfield which is provided in Section 2.2, <i>History of the Felker Army Airfield and Mission Support</i>. We included more text in the cumulative effects section so readers can better understand which past cumulative effects were considered and that we did consider the past development of the airfield in the cumulative effects analysis.</p> | |
| <p>Page 5-2 states that an Aviation Complex is currently in the design phase at JBLE-Eustis. WE recommend that known or estimated impacts associated with this action be included and considered in the cumulative impact analysis, particularly if the action results in the removal of upland, wetland or aquatic habitats, as well as if the proposed complex is located near any hazardous and toxic sites. Page 5-3 noted impacts to water resources from future construction of the Aviation Complex; it is recommended that more detail be provided regarding these impacts.</p> | <p>Concur, we added an additional reference to the Aviation Complex EA in the text.</p> | <p>Yes</p> |
| <p>Please clarify where materials will be stock-piled and disposed of; we recommend that no materials be stockpiled or disposed of within wetlands. Please clarify how soil disturbance from tree felling and log dragging will be minimized to the maximum extent practicable.</p> | <p>Stockpiling would occur within the project footprint in upland or developed areas only. There would be no stockpiling or disposal of materials in wetlands – this is described in the Draft Final EA in Section 6, <i>Special Procedures</i>; we will also reference the forestry BMPs in the text (Section 6, <i>Special Procedures</i>).</p> | <p>Yes</p> |
| <p>If temporary or permanent stream crossings are necessary as part of the proposed action, we recommend these be considered within the EA.</p> | <p>We do not anticipate any stream crossings with implementation of project, though we mention that BMPs for stream crossings would be implemented if it is necessary to move equipment in saturated</p> | <p>Yes</p> |

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| | areas. We clarified the text describing this potential action in the EA. | |
|--|--|--|



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

October 12, 2017

Tracey Sugg
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, VA 23510-1011

Re: Environmental Assessment for Management of Vegetation Airfield Clearances at Felker Army Airfield; Joint Base Langley Eustis – Fort Eustis, Virginia; July 2017

Dear Ms. Sugg:

In accordance with the National Environmental Policy Act (NEPA) of 1969, Section 309 of the Clean Air Act and Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), the U.S. Environmental Protection Agency (EPA) has reviewed the Environmental Assessment (EA) for the Management of Vegetation Airfield Clearances at Felker Army Airfield located at Joint Base Langley Eustis – Fort Eustis, Virginia. The Proposed Action involves attaining and maintaining vegetation clearances within the primary surface, the clear zone, and the approach-departure clearance surface at Felker Army Airfield, in order to provide adequate margins of safety for aircraft take offs and landings in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning Design* (UFC) 3-260-01.

The EA evaluated several alternatives, including Alternative 1, Alternative 2, Alternative 3, and the no action alternative. Alternative 3 has been identified as the preferred alternative, which involves tree cutting, removal and mowing in the primary surface and clear zone 1, and tree topping in clear zone 2 and clear zone 3. This alternative has the least amount of tree clearing and topping of all of the proposed action alternatives while still meets the purpose and need in accordance with UFC 3-260-01.

Overall, EPA found the EA to be thorough, and the methodologies and potential impacts were clearly explained and discussed. EPA has enclosed specific technical comments in order to improve the clarity of project maintenance, proposed mitigation and the cumulative impact analysis. We appreciate the opportunity to review this project. If you have questions regarding these comments, the staff contact for this project is Alaina McCurdy; she can be reached at 215-814-2741.

Sincerely,

A handwritten signature in blue ink, appearing to read "Barbara Rudnick".

Barbara Rudnick
NEPA Team Leader
Office of Environmental Programs

Enclosure (1)

Technical Comments
Management of Vegetation Clearances at Felker Army Airfield
Environmental Assessment

- While the EA states that there are no hazardous sites within the Region of Influence (ROI), it is recommended that CERCLA sites near the airfield be identified and discussed in terms of cleanup status and potential impacts from/to the Proposed Action. Including sites near the airfield that may be outside the ROI should be considered in the cumulative impact analysis.
- We recommend that impacts to water resources also consider potential impacts to downstream impaired waterbodies. If there are impaired waters that maybe indirectly impacted by additional clearing upstream, perhaps compensatory mitigation considered for the proposed action could be located along this reach.
- Please clarify if flood elevation is expected to raise or be unaffected by the proposed clearing activities in primary surface, CZ1 and approach departure clearance surfaces. If the flood elevation may be affected, we recommend this impact be considered and addressed appropriately.
- Pg 4-15 states that a LIDAR analysis would be done every five years to assess tree heights in Zone 3 and remove additional trees in the CZ3 that require topping. Please clarify if this analysis will also be also completed for CZ2, as these zones within Alternative 3 are receiving the same vegetation treatment. We suggest that maintenance associated with Alternative 3 be clarified. Additionally, maintenance should be considered within the cumulative impacts analysis.
- The EA considers forest systems within the ROI. It is recommended that these functions be considered in any compensatory mitigation developed for both forested wetlands and upland forests. Among these functions, you may consider the functions performed as a carbon sink, and ways to incorporate this concept into any mitigation for lost resources.
- Appendix E describes the wetland mitigation plan for the proposed action, which seeks to purchase wetland compensatory mitigation credits from an approved wetland mitigation bank. It is recommended that the size, function and value of impacted wetlands be considered in order to develop a compensatory mitigation plan. In addition to this, we recommend considering potential opportunities on the base to address forested wetland and upland impacts as well as other forest functions.
- The EA states that cumulative impact analysis considers past and reasonably foreseeable future projects with the potential to contribute to cumulative impacts of the proposed action. However, it does not appear that the analysis includes a full suite of past actions. We recommend for a more complete, robust analysis the temporal scope of past actions be defined to include the development of the airfield. This may provide a fuller cumulative impact analysis of forest, habitat, and wetland impacts within the ROI.
- Page 5-2 states that an Aviation Complex is currently in the design phase at JBLE- Eustis. We recommend that known or estimated impacts associated with this action be included and considered in the cumulative impact analysis, particularly if the action results in the removal of upland, wetland, or aquatic habitats, as well as if the proposed complex is located near any hazardous and toxic sites. Page 5-3 noted impacts to water resources from future construction of the Aviation Complex; it is recommended that more detail be provided regarding these impacts.
- Please clarify where materials will be stock-piled and disposed of; we recommend that no materials be stockpiled or disposed of within wetlands. Please clarify how soil disturbance from tree felling and log dragging will be minimized to the maximum extent practicable.
- If temporary or permanent stream crossings are necessary as part of the proposed action, we recommend these be considered within the EA.



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

August 15, 2017

Ms. Bettina Sullivan
Department of Environmental Quality
Office of Environmental Impact Review
& Long Range Priorities Program
Post Office Box 1105
Richmond, Virginia 23218

Re: Draft Environmental Assessment and Coastal Zone Management Act Federal Consistency Determination for the Proposed Action: Management of Vegetation Clearance at Felker Army Airfield, Joint Base Langley Eustis-Fort Eustis, Virginia

Dear Ms. Sullivan,

Joint Base Langley Eustis-Ft. Eustis (JBLE-Eustis) proposes to manage vegetation clearance at Felker Army Airfield, located on Mulberry Island at the JBLE-Eustis, Virginia. The purpose of the Proposed Action is to provide the adequate margins of safety for aircraft take-offs and landings in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning and Design* (UFC) 3-260-01 at the Felker Army Airfield. The need to attain vegetation clearances was cited in the Triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency Inspection team on May 30, 2014. Implementation of the Preferred Alternative will result in meeting the UFC 3-260-01 vegetation clearance requirement within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach Departure Clearance Surface Area adjacent to the Clear Zone. This action also will maintain compliance with the UFC 3-260-01 over time to the maximum, practical extent.

The U.S. Army Corps of Engineers (USACE), on behalf of the JBLE-Eustis, has prepared and made available for public review a Draft Environmental Assessment (EA) for the management of vegetation airfield clearance at Felker Army Airfield. This document identifies environmental resources including land use; noise; air quality; water resources; safety and occupational health; hazardous and toxic materials and wastes; biological resources; cultural resources; geology and soils; transportation and circulation; and aesthetics and visual resources; and evaluates potential environmental impacts of the proposed alternatives. No significant direct, indirect, or cumulative adverse effects on the human environment is anticipated from implementation of the Preferred Alternative. A 60-day public comment period is being held to receive comments on the Draft EA. Federal, state, and local agencies, tribal governments, and the public are invited to comment on the Draft EA. The JBLE-Eustis and the USACE invite and would greatly value your agency's comments.

To be considered, all comments must be received by October 14, 2017. An electronic copy of the Draft EA is available for public viewing at the JBLE-Eustis Website:
<http://www.jble.af.mil/Portals/46/Documents/Eustis%20Environmental/Public%20Notices/Final%20Draft%20EA%20for%20Management%20of%20Vegetation%20Airfield%20Clearances%20at%20Felker%20Ar>

[my%20Airfield%20-%20July%202017.pdf?ver=2017-08-03-114302-283](#). Hard copies or electronic compact disk copies of the Draft EA will be made available upon request.

Additionally, attached for your review is the Coastal Zone Management Act (CZMA) Federal Consistency determination for the Management of Vegetation Airfield Clearance at Felker Army Airfield, JBLE-Eustis, Virginia.

Comments and/or questions pertaining to the Draft EA or CZMA, or requests for a hard copy or electronic compact disk copy of the Draft EA or CZMA must be submitted to Tracey Sugg by phone at 757-878-7375 or by email at tracey.l.sugg.civ@mail.mil. Thank you for your assistance.



Alicia Logalbo
Chief, Environmental Analysis Section
USACE Norfolk District



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

August 15, 2017

Everett Skipper
Director of Engineering
City of Newport News
2400 Washington Ave.
Newport News, VA 23607

Re: Draft Environmental Assessment for Proposed Action: Management of Vegetation Airfield Clearance at Felker Army Airfield

Dear Mr. Skipper,

Joint Base Langley Eustis-Ft. Eustis (JBLE-Eustis) proposes to manage vegetation airfield clearance at Felker Army Airfield, located on Mulberry Island at the JBLE-Eustis, Virginia. The purpose of the Proposed Action is to provide the adequate margins of safety for aircraft take-offs and landings in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning and Design* (UFC) 3-260-01. The need to attain and maintain vegetation clearance was cited in the Triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency Inspection team on May 30, 2014. Implementation of the preferred alternative will result in meeting the UFC 3-260-01 vegetation clearance requirement within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach Departure Clearance Surface Area adjacent to the Clear Zone. This action also will maintain compliance with the UFC 3-260-01 over time to the maximum, practical extent.

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Sincerely,

A handwritten signature in black ink, appearing to read 'Alicia Logalbo', written in a cursive style.

Alicia Logalbo
Chief, Environmental Analysis Section
USACE Norfolk District



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

August 15, 2017

Cynthia Schulz
U.S. Fish and Wildlife Service
Virginia Field Office
Division of Ecological Services
6669 Short Lane
Gloucester VA, 23061

Re: Draft Environmental Assessment for Proposed Action: Management of Vegetation Airfield Clearance at Felker Army Airfield

Dear Ms. Schulz,

Joint Base Langley Eustis-Ft. Eustis (JBLE-Eustis) proposes to manage vegetation airfield clearance at Felker Army Airfield, located on Mulberry Island at the JBLE-Eustis, Virginia. The purpose of the Proposed Action is to provide the adequate margins of safety for aircraft take-offs and landings in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning and Design* (UFC) 3-260-01. The need to attain and maintain vegetation clearance was cited in the Triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency Inspection team on May 30, 2014. Implementation of the preferred alternative will result in meeting the UFC 3-260-01 vegetation clearance requirement within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach Departure Clearance Surface Area adjacent to the Clear Zone. This action also will maintain compliance with the UFC 3-260-01 over time to the maximum, practical extent.

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Sincerely,

A handwritten signature in black ink, appearing to read 'A. Logalbo', with a stylized flourish at the end.

Alicia Logalbo
Chief, Environmental Analysis Section
USACE Norfolk District



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

August 15, 2017

Cynthia Rohlf
Newport News City Manager
City Hall
2400 Washington Ave.
Newport News, VA 23607

Re: Draft Environmental Assessment for Proposed Action: Management of Vegetation Airfield Clearance at Felker Army Airfield

Dear Ms. Rohlf,

Joint Base Langley Eustis-Ft. Eustis (JBLE-Eustis) proposes to manage vegetation airfield clearance at Felker Army Airfield, located on Mulberry Island at the JBLE-Eustis, Virginia. The purpose of the Proposed Action is to provide the adequate margins of safety for aircraft take-offs and landings in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning and Design* (UFC) 3-260-01. The need to attain and maintain vegetation clearance was cited in the Triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency Inspection team on May 30, 2014. Implementation of the preferred alternative will result in meeting the UFC 3-260-01 vegetation clearance requirement within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach Departure Clearance Surface Area adjacent to the Clear Zone. This action also will maintain compliance with the UFC 3-260-01 over time to the maximum, practical extent.

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Sincerely,

A handwritten signature in black ink, appearing to read "Alicia Logalbo". The signature is fluid and cursive, with the first name being more prominent.

Alicia Logalbo
Chief, Environmental Analysis Section
USACE Norfolk District



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

August 15, 2017

Barbara Rudnick
United States Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Draft Environmental Assessment for Proposed Action: Management of Vegetation Airfield Clearance at Felker Army Airfield

Dear Ms. Rudnick,

Joint Base Langley Eustis-Ft. Eustis (JBLE-Eustis) proposes to manage vegetation airfield clearance at Felker Army Airfield, located on Mulberry Island at the JBLE-Eustis, Virginia. The purpose of the Proposed Action is to provide the adequate margins of safety for aircraft take-offs and landings in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning and Design* (UFC) 3-260-01. The need to attain and maintain vegetation clearance was cited in the Triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency Inspection team on May 30, 2014. Implementation of the preferred alternative will result in meeting the UFC 3-260-01 vegetation clearance requirement within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach Departure Clearance Surface Area adjacent to the Clear Zone. This action also will maintain compliance with the UFC 3-260-01 over time to the maximum, practical extent.

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Sincerely,

A handwritten signature in black ink, appearing to read 'A. Logalbo', with a stylized flourish at the end.

Alicia Logalbo
Chief, Environmental Analysis Section
USACE Norfolk District



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 733d MISSION SUPPORT GROUP
JOINT BASE LANGLEY-EUSTIS
FORT EUSTIS, VIRGINIA

AUG 08 2017

Civil Engineering Division

Mr. Marc Holma
Review and Compliance
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Mr. Holma,

In May of 2016 we invited your office's input on an action to modify and remove vegetation from around the Felker Army Air Field on the Fort Eustis portion of Joint Base Langley-Eustis. That letter articulated our desire to execute this project with no adverse effect on historic and cultural properties. The enclosed final draft of the environmental assessment (EA) shows that goal was achieved.

Although there are historic and cultural properties in the projects boundary by using the controlled methods of vegetation removal there will be no damage or adverse effect to the cultural resources.

Please review the enclosed draft of the EA. Archaeological sites 44NN0089, 44NN0125, 44NN0126, 44NN0202, and 44NN0204 are in the projects area of potential effect. All alternatives have conditions in place that would ensure no adverse effect to historic properties.

The Air Force has determined that this project will have no adverse effect on historic properties. Therefore, the Air Force has determined that no further work is required in order for this project to proceed in compliance with the National Historic Preservation Act of 1966, as amended. We request that you review this determination and forward your comments within 30 days. If you do not comment within 30 days, we will assume you agree with the Air Force's determination of no historic properties adversely affected by this undertaking and will proceed without taking further steps in the Section 106 process.

If you have any questions regarding this undertaking please contact Dr. Christopher L. McDaid at (757) 878-7365 or email christopher.l.mcdaid.civ@mail.mil.

Sincerely,

A handwritten signature in blue ink that reads "Donald W. Calder Jr".

Donald W. Calder, Jr.
Chief, Environmental Element
733d Civil Engineer Division

Enclosure

The VDHR concurs with the Air Force's determination of no adverse effect to historic properties for the following undertaking

Project Reference: Felker Airfield Vegetation control.

 11 Sept 17
Signature/Date

2016-1018

From: James Dolan, MS, CWB
Wildlife Biologist
Joint Base Langley-Eustis, Fort Eustis
1407 Washington Blvd
Fort Eustis, VA 23604
757-878-4152

To: U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061

30 November 2016

Re: Online Project Review Request, Felker Army Airfield Tree Clearing, Joint Base Langley-Eustis, Fort Eustis, Virginia

We have reviewed the referenced project using the Virginia Field Office's online project review process and have followed all guidance and instructions in completing the review. We completed our review on 30 November 2016 and are submitting our project review package in accordance with the instructions for further review.

Our proposed action consists of: Tree removal in approach and departure zones of the Felker Army Airfield runway in accordance with UFC 3-261-1.

The location of the project and the action area are identified on the enclosed map.

The project is expected to be completed between 1 January 2017 and 30 September 2020.

This project review is needed for compliance with section 7 of the ESA.

Two (2) federally listed bat species have been found to occur on Fort Eustis, Northern Long Eared Bat, *Myotis septentrionalis* (MYSE) and the Indiana Bat, *Myotis sodalis* (MYSO), thus consultation is required. A bat survey was conducted throughout the installation, in May and July 2016, utilizing acoustic recording devices and mist netting. During the bat surveys, MYSE and MYSO were acoustically identified at 5 and 3 acoustic detection locations, respectively. Further, 2 male MYSE were captured in mist nets (one individual per net); no MYSO were captured on the installation.

This project is to remove all trees that occur within the approach and departure glide slope of the Felker Army Airfield runway on Joint Base Langley-Eustis, Fort Eustis. This project is undergoing an Environment Analysis as part of the Air Force Environmental Impact Analysis Process. Although the total project site encompasses 240 acres, a maximum of 98 acres of trees exist within the project foot print.

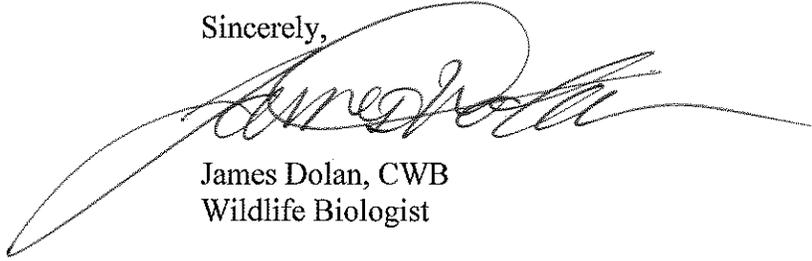
During the bat survey, a MYSO habitat survey was conducted within the foot print of another project that encompassed approximately 240 acres. The MYSO habitat survey indicated

a total of 20 trees that met minimum requirements for potential MYSO roost sites, but that there was no indication of utilization. The Virginia Department of Game and Inland Fisheries have no data on MYSE maternal roosts in the vicinity of Fort Eustis.

The enclosed project review package provides the information about the species, critical habitat, and bald eagles considered in our review, and the species conclusions table included in the package identifies our determinations for the resources that may be affected by the project.

For additional information, please contact James Dolan at the address listed above.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Dolan', with a long, sweeping horizontal flourish extending to the right.

James Dolan, CWB
Wildlife Biologist

Enclosures:

- 1) Project Map
- 2) Species Conclusion Table
- 3) Official Species List

Felker Army Airfield Tree Clearing



James River

Felker Army Airfield

James River

-  FAAF Glide Slope and Clear Zones
-  FAAF Tree Clearing
-  Surface Water
-  Wetlands





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 SHORT LANE
GLOUCESTER, VA 23061
PHONE: (804)693-6694 FAX: (804)693-9032
URL: www.fws.gov/northeast/virginiafield/

Consultation Code: 05E2VA00-2017-SLI-0680

November 30, 2016

Event Code: 05E2VA00-2017-E-00719

Project Name: Felker Army Airfield Tree Clearing

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and

endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: Felker Army Airfield Tree Clearing

Official Species List

Provided by:

Virginia Ecological Services Field Office

6669 SHORT LANE

GLOUCESTER, VA 23061

(804) 693-6694

<http://www.fws.gov/northeast/virginiafield/>

Consultation Code: 05E2VA00-2017-SLI-0680

Event Code: 05E2VA00-2017-E-00719

Project Type: MILITARY OPERATIONS / MANEUVERS

Project Name: Felker Army Airfield Tree Clearing

Project Description: Removal of trees within approach and departure glide slopes of runway

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: Felker Army Airfield Tree Clearing

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-76.61968231201172 37.14252976929988, -76.61255836486816 37.13667974186011, -76.60281658172607 37.130795047386236, -76.59423351287842 37.12607327557608, -76.59822463989258 37.12254886259509, -76.60521984100342 37.12870792371265, -76.61448955535889 37.13462699344163, -76.62341594696045 37.13876664565854, -76.61968231201172 37.14252976929988)))

Project Counties: Newport News, VA



United States Department of Interior
Fish and Wildlife Service

Project name: Felker Army Airfield Tree Clearing

Endangered Species Act Species List

There are a total of 1 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

| Mammals | Status | Has Critical Habitat | Condition(s) |
|---|------------|----------------------|--------------|
| Northern long-eared Bat (<i>Myotis septentrionalis</i>) Population: Wherever found | Threatened | | |



United States Department of Interior
Fish and Wildlife Service

Project name: Felker Army Airfield Tree Clearing

Critical habitats that lie within your project area

There are no critical habitats within your project area.



United States Department of Interior
Fish and Wildlife Service

Project name: Felker Army Airfield Tree Clearing

Appendix A: FWS National Wildlife Refuges and Fish Hatcheries

There are no refuges or fish hatcheries within your project area.

Species Conclusions Table

Project Name: Fort Eustis, Felker Army Airfield Tree Clearing

Date: 30 November 2016

| Species / Resource Name | Conclusion | ESA Section 7 / Eagle Act Determination | Notes / Documentation |
|-------------------------|---|---|--|
| Northern Long Eared Bat | Species Present | Not Likely to Adversely Affect | Implementing a TOYR (April 15 - Sept 15) for tree clearing |
| Northern Long Eared Bat | Suitable habitat present | Not Likely to Adversely Affect | Implementing a TOYR (April 15 - Sept 15) for tree clearing. This project may impact up to 98 acres of forest, but is adjacent to 2,792 acres of forest that contains similar percentages of suitable habitat. |
| Critical Habitat | No Critical Habitat Present | No Effect | |
| Bald Eagle | Unlikely to disturb nesting bald eagles | No Eagle Act Permit Required | Work will be performed outside of 660' protection buffer |
| Bald Eagle | Does intersect with eagle concentration area | Eagle Act permit may be required | Fort Eustis maintains a Purposeful Eagle Take for Safety/Eagle Nest Take FWS Migratory Bird Permit (MB237450-0) for the removal of any active nest and conduct harassment to intentionally disturb bald eagles within 1 mile of Felker Army Airfield. Tree clearing areas that intersect with eagle concentration areas are the approach and departure zones for FAAF operations. |
| Indiana Bat | Species recorded with acoustics, but not captured | Not Likely to Adversely Affect | Implementing a TOYR (April 15 - Sept 15) for tree clearing. |
| Indiana Bat | Potential habitat present | Not Likely to Adversely Affect | Implementing a TOYR (April 15 - Sept 15) for tree clearing. This project may impact up to 98 acres of forest, but is adjacent to 2,792 acres of forest that contains similar percentages of potential habitat. |

Logalbo, Alicia M CIV USARMY CENAO (US)

From: Sugg, Tracey L CIV USAF (US) <tracey.l.sugg.civ@mail.mil>
Sent: Wednesday, December 14, 2016 10:58 AM
To: Logalbo, Alicia M CIV USARMY CENAO (US)
Subject: [EXTERNAL] FW: [Non-DoD Source] Fort Eustis Felber Army Airfield Tree Clearing

Hi again, Alicia,

Here is what James received from USFWS regarding the bats...

VR,
Tracey

-----Original Message-----

From: Dolan, James Douglas (James) CIV USAF 733 MSG (US)
Sent: Wednesday, December 14, 2016 10:54 AM
To: Sugg, Tracey L CIV USAF (US) <tracey.l.sugg.civ@mail.mil>
Subject: FW: [Non-DoD Source] Fort Eustis Felber Army Airfield Tree Clearing

See below

James Dolan, MS, CWB, SCMNRP
Wildlife Biologist
733d MSG/CED/CEIE
1407 Washington Blvd
O: 757-878-4152
DSN: 826-4152
C: 757-817-1510

-----Original Message-----

From: Nystrom, Sarah [mailto:sarah_nystrom@fws.gov]
Sent: Wednesday, December 14, 2016 10:33 AM
To: Dolan, James Douglas (James) CIV USAF 733 MSG (US) <james.d.dolan.civ@mail.mil>
Subject: [Non-DoD Source] Fort Eustis Felber Army Airfield Tree Clearing

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

We have reviewed the project package received on November 30, 2016 for the referenced project. The following comments are provided under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended, and Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 54 Stat. 250), as amended.

We concur with the determinations provided in the Species Conclusion Table dated November 30, 2016 and have no further comments. No eagle act permit would be recommended for tree clearing associated with this project. Should project plans change or if additional information on the distribution of listed species or critical habitat becomes available, this determination may be reconsidered. If you have any questions, please contact me at (413) 253-2413, or via email at Sarah_Nystrom@fws.gov < Caution-mailto:Sarah_Nystrom@fws.gov > .

Thanks!

Sarah

--

Sarah Nystrom

Fish and Wildlife Biologist
Virginia Field Office - Ecological Services
6669 Short Lane
Gloucester, Virginia 23061
(804) 824-2413



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633d AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

MAY 12 2016

Chief Robert Gray
191 Lay Landing Rd
Pamunkey Indian Reservation
King William, VA 23086

Dear Chief Gray,

The Felker Army Air Field, located on the Fort Eustis portion of Joint Base Langley-Eustis (JBLE-E), was given notice that the airfield clear zones were not in compliance with Army Regulation 95-2 for Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control and Navigational Aids. In 2007 and at present, many trees are in violation of Clear and Transitional Zone height limits. In order to correct this issue, JBLE-E is planning to address the FAA notice of violation by removing trees in some areas and topping trees in other areas in the Approach-Departure Clearance Surfaces and Transitional Zones around the airfield.

We are currently developing an Environmental Assessment for this action that analyzes the various alternatives. JBLE-E has consulted with your Tribe in the past regarding cultural resources, and I am inviting the Tribe to enter into Government-to-Government consultation regarding this project. There are cultural resources within the project area, and we expect to complete this project with no adverse effects to the cultural resources. However, we have not decided on our final course of action and look forward to your input on the project.

If you would like a copy of the draft Environmental Assessment or any other information regarding this project, please contact me at 757-878-1935 or william.s.galbraith.mil@mail.mil.

Sincerely,


WILLIAM S. GALBRAITH, Colonel, USA
Commander, 733d Mission Support Group

CF:
Tribal Historic Preservation Officer



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633d AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

Chief Bill Harris
Catawba Indian Nation
996 Avenue of the Nations
Rock Hill, SC 29730

MAY 12 2016

Dear Chief Harris,

The Felker Army Air Field, located on the Fort Eustis portion of Joint Base Langley-Eustis (JBLE-E), was given notice that the airfield clear zones were not in compliance with Army Regulation 95-2 for Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control and Navigational Aids. In 2007 and at present, many trees are in violation of Clear and Transitional Zone height limits. In order to correct this issue, JBLE-E is planning to address the FAA notice of violation by removing trees in some areas and topping trees in other areas in the Approach-Departure Clearance Surfaces and Transitional Zones around the airfield.

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If you would like a copy of the draft Environmental Assessment or any other information regarding this project, please contact me at 757-878-1935 or william.s.galbraith.mil@mail.mil.

Sincerely,


WILLIAM S. GALBRAITH, Colonel, USA
Commander, 733d Mission Support Group

CF:
Tribal Historic Preservation Officer & Director, Catawba Culturel Preservation Project



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633d AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

President Kerry Holton
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

MAY 1 2 2016

Dear President Holton,

The Felker Army Air Field, located on the Fort Eustis portion of Joint Base Langley-Eustis (JBLE-E), was given notice that the airfield clear zones were not in compliance with Army Regulation 95-2 for Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control and Navigational Aids. In 2007 and at present, many trees are in violation of Clear and Transitional Zone height limits. In order to correct this issue, JBLE-E is planning to address the FAA notice of violation by removing trees in some areas and topping trees in other areas in the Approach-Departure Clearance Surfaces and Transitional Zones around the airfield.

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If you would like a copy of the draft Environmental Assessment or any other information regarding this project, please contact me at 757-878-1935 or william.s.galbraith.mil@mail.mil.

Sincerely,

A handwritten signature in black ink, appearing to read "William S. Galbraith", is positioned above the typed name.

WILLIAM S. GALBRAITH, Colonel, USA
Commander, 733d Mission Support Group

CF:
Director Cultural Preservation



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 633d AIR BASE WING
JOINT BASE LANGLEY-EUSTIS VA

Chief Chester Brooks
Delaware Tribe
170 NE Barbara Ave
Bartlesville, OK 74006

MAY 1 2 2016

Dear Chief Brooks,

The Felker Army Air Field, located on the Fort Eustis portion of Joint Base Langley-Eustis (JBLE-E), was given notice that the airfield clear zones were not in compliance with Army Regulation 95-2 for Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control and Navigational Aids. In 2007 and at present, many trees are in violation of Clear and Transitional Zone height limits. In order to correct this issue, JBLE-E is planning to address the FAA notice of violation by removing trees in some areas and topping trees in other areas in the Approach-Departure Clearance Surfaces and Transitional Zones around the airfield.

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If you would like a copy of the draft Environmental Assessment or any other information regarding this project, please contact me at 757-878-1935 or william.s.galbraith.mil@mail.mil.

Sincerely,


WILLIAM S. GALBRAITH, Colonel, USA
Commander, 733d Mission Support Group

CF:
Historic Preservation Representative

APPENDIX D

ENVIRONMENTAL APPENDIX

DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS,
VIRGINIA



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RECORD OF NON-APPLICABILITY CONCERNING THE GENERAL CONFORMITY RULE

PROPOSED ACTION

Proposed Action Name: Management of Vegetation Airfield Clearances at Felker Army Airfield

Location: Joint Base Langley Eustis-Fort Eustis (JBLE-Eustis), Virginia

Project Begin Date (approximate): Approximately 2020 (if appropriations are provided)

Project End Date (approximate): Not applicable as long-term maintenance of hazardous vegetation would be required.

Project Action Summary: The *purpose* of the Proposed Action is to attain and maintain vegetation clearances within the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface Area adjacent to the Clear Zone at the Felker Army Airfield, JBLE-Eustis that provide the adequate margins of safety for aircraft take-offs and landings in accordance with the Unified Facilities Criteria 3-260-01 to the maximum, practical extent. Implementation of the Preferred Alternative (Alternative 3) includes the removal and treatment of hazardous vegetation in the Primary Surface and Clear Zone 1 (except in Emergent Wetlands where trees will be cut to stumps) and the topping of trees to required heights in the Clear Zone 2, Clear Zone 3, and in the Approach-Departure Clearance Surface Area at the Felker Army Airfield.

The Clean Air Act requires federal actions in air pollutant nonattainment or maintenance areas to conform to the applicable State Implementation Plan (SIP). The SIP is designed to achieve or maintain an attainment designation of air pollutants as defined by the National Ambient Air Quality Standards (NAAQS). The regulations governing this requirement are found in 40 Code of Federal Regulations Part 93, also known as the General Conformity Rule (GCR), which applies to federal actions occurring in regions designated as nonattainment or areas subject to maintenance plans. The JBLE-Eustis is located in the Hampton Roads Intrastate Air Quality Control Region that is in attainment with all NAAQS for criteria pollutants. Therefore, implementation of the Preferred Alternative is exempt from the GCR requirement to prepare a Conformity Determination.

RONA Approval

David F. Kattler, Colonel, USAF
Chief, Civil Engineering Division

DATE

Vegetation Occurring in the Region of Influence (Joint Base Langley Eustis-Fort Eustis et al. 2014)

| Scientific Name | Common Name |
|---|-------------------------|
| <i>Acer rubrum</i> | red maple |
| <i>Achillea millefolium</i> | yarrow |
| <i>Agalinis purpurea</i> | purple false foxglove |
| <i>Ageratina altissima var. altissima</i> | white snakeroot |
| <i>Ailanthus altissima</i> | tree-of-heaven |
| <i>Albizia julibrissin</i> | mimosa tree |
| <i>Alisma subcordatum</i> | American water plantain |
| <i>Allium vineale</i> | field garlic |
| <i>Alnus serrulata</i> | common alder |
| <i>Amelanchier spicata</i> | running serviceberry |
| <i>Amphicarpaea bracteata</i> | American hogpeanut |
| <i>Anagallis arvensis</i> | scarlet pimpernel |
| <i>Apios americana</i> | groundnut |
| <i>Aralia spinosa</i> | Devil's walking stick |
| <i>Arisaema triphyllum</i> | Jack in the pulpit |
| <i>Aronia arbutifolia</i> | red chokeberry |
| <i>Asclepias incarnata</i> | swamp milkweed |
| <i>Asclepias lanceolata</i> | smooth orange milkweed |
| <i>Asclepias syriaca</i> | common milkweed |
| <i>Asimina triloba</i> | pawpaw |
| <i>Asparagus officinalis</i> | garden asparagus |
| <i>Asplenium platyneuron</i> | ebony spleenwort |
| <i>Athyrium filix-femina</i> | common ladyfern |
| <i>Baccharis halimifolia</i> | groundsel tree |
| <i>Bidens bipinnata</i> | Spanish needles |

| Scientific Name | Common Name |
|----------------------------------|----------------------------|
| <i>Bidens frondosa</i> | sticktight or beggar ticks |
| <i>Bidens polylepis</i> | beggar ticks |
| <i>Bidens trichosperma</i> | tickseed sunflower |
| <i>Boehmeria cylindrica</i> | false nettle |
| <i>Boltonia caroliniana</i> | Carolina doll's daisy |
| <i>Botrychium virginianum</i> | common grape fern |
| <i>Broussonetia papyrifera</i> | paper mulberry |
| <i>Cakile edentula</i> | American searocket |
| <i>Callicarpa americana</i> | French mulberry |
| <i>Campsis radicans</i> | trumpet creeper |
| <i>Carex folliculata</i> | northern long sedge |
| <i>Carex longii</i> | long's sedge |
| <i>Carex lupulina</i> | hop sedge |
| <i>Carex lurida</i> | shallow sedge |
| <i>Carya cordiformis</i> | bitternut hickory |
| <i>Carya tomentosa</i> | mockernut hickory |
| <i>Celtis laevigata</i> | sugarberry |
| <i>Celtis occidentalis</i> | hackberry |
| <i>Cephalanthus occidentalis</i> | buttonbush |
| <i>Chaerophyllum tainturieri</i> | wild chervil |
| <i>Chamaecrista nictitans</i> | partridge pea |
| <i>Clematis terniflora</i> | clematis |
| <i>Clitoria mariana</i> | butterfly pea |
| <i>Coleataenia anceps</i> | beaked panicgrass |
| <i>Conoclinium coelestinum</i> | mist flower |
| <i>Convolvulus arvensis</i> | field bind weed |
| <i>Conyza canadensis</i> | Canadian horseweed |

| Scientific Name | Common Name |
|----------------------------------|------------------------|
| <i>Cornus florida</i> | flowering dogwood |
| <i>Cryptotaenia canadensis</i> | Canadian honewort |
| <i>Cuscuta indecora</i> | common dodder |
| <i>Cuscuta pentagona</i> | five angled dodder |
| <i>Cynodon dactylon</i> | bermuda grass |
| <i>Cynoglossum virginianum</i> | wild comprey |
| <i>Cyperus pseudovegetus</i> | marsh flatsedge |
| <i>Cyperus strigosus</i> | strawcolored flatsedge |
| <i>Cytisus scoparius</i> | scotch broom |
| <i>Daucus carota</i> | Queen Anne's lace |
| <i>Decodon verticillatus</i> | swamp loosestrife |
| <i>Desmanthus illinoensis</i> | prairie bundleflower |
| <i>Digitaria sanguinalis</i> | flat top goldentop |
| <i>Diodella teres</i> | poor Joe |
| <i>Diospyros virginiana</i> | persimmon |
| <i>Draba verna</i> | spring draba |
| <i>Duchesnea indica</i> | Indian strawberry |
| <i>Dysphania ambrosioides</i> | Mexican tea |
| <i>Echinochloa crus-galli</i> | barnyard grass |
| <i>Eclipta prostrata</i> | false daisy |
| <i>Elaeagnus umbellata</i> | autumn olive |
| <i>Elaeagnus pungens</i> | thorny olive |
| <i>Eleocharis obtusa</i> | blunt spikerush |
| <i>Elephantopus carolinianus</i> | Carolina elephantsfoot |
| <i>Elephantopus tomentosus</i> | devil's grandmother |
| <i>Elymus virginicus</i> | Virginia wildrye |
| <i>Epifagus virginiana</i> | beech drops |

| Scientific Name | Common Name |
|---|---------------------------|
| <i>Eragrostis pilosa</i> | Indian lovegrass |
| <i>Erigeron philadelphicus</i> | Philadelphia fleabane |
| <i>Erigeron pulchellus</i> | Robin's plaintain |
| <i>Erigeron quercifolius</i> | overleaf fleabane |
| <i>Erigeron strigosus</i> | lesser daisy fleabane |
| <i>Erigeron vernus</i> | early whitetop fleabane |
| <i>Eupatorium hyssopifolium</i> | hyssop-leaved throughwort |
| <i>Eupatorium rotundifolium</i> | round leaved boneset |
| <i>Euphorbia prostrata</i> | prostrate spurge |
| <i>Euthamia graminifolia</i> | flat-top goldentop |
| <i>Fagus grandifolia</i> | American beech |
| <i>Festuca spp.</i> | fescue |
| <i>Fraxinus americana</i> | white ash |
| <i>Galium circaezans</i> | licorice bedstraw |
| <i>Galium tinctorium</i> | stiff marsh bedstraw |
| <i>Gamochaeta purpurea</i> | cudweed |
| <i>Geranium dissectum</i> | cranesbill |
| <i>Geum canadense</i> | white avens |
| <i>Geum virginianum</i> | cream avens |
| <i>Glechoma hederacea</i> | ground ivy |
| <i>Gonolobus suberosus var. suberosus</i> | milkvine |
| <i>Gratiola neglecta</i> | clammy hedgehyssop |
| <i>Hedera helix</i> | English ivy |
| <i>Hexastylis virginica</i> | heartleaf wild ginger |
| <i>Hibiscus moscheutos</i> | crimson-eyed rosemallow |
| <i>Houstonia caerulea</i> | azure bluet |
| <i>Houstonia pusilla</i> | tiny bluet |

| Scientific Name | Common Name |
|-------------------------------|--------------------------------------|
| <i>Hydrocotyle umbellata</i> | marsh pennywort |
| <i>Hypericum gentianoides</i> | orangegrass |
| <i>Hypericum mutilum</i> | dwarf St. Johnswort |
| <i>Hypericum punctatum</i> | spotted St. Johnswort |
| <i>Hypochaeris radicata</i> | cats ear |
| <i>Hypoxis hirsuta</i> | star grass |
| <i>Ilex opaca</i> | American holly |
| <i>Ipomoea purpurea</i> | common morning glory |
| <i>Iva frutescens</i> | Jesuit's bark |
| <i>Juglans nigra</i> | black walnut |
| <i>Juncus diffusissimus</i> | slimpod rush |
| <i>Juncus effusus</i> | common rush |
| <i>Juncus marginatus</i> | grassleaf rush |
| <i>Juncus roemerianus</i> | needlegrass rush or blackneedle rush |
| <i>Juniperus virginiana</i> | eastern redcedar |
| <i>Krigia virginica</i> | dwarf dandelion |
| <i>Lamium amplexicaule</i> | henbit deadnettle |
| <i>Lechea racemulosa</i> | Illinois pinweed |
| <i>Leersia spp.</i> | cutgrass |
| <i>Lespedeza bicolor</i> | schrubby lespedeza |
| <i>Lespedeza cuneata</i> | Chinese lespedeza |
| <i>Lespedeza procumbens</i> | trailing lespedeza |
| <i>Lespedeza repens</i> | creeping lespedeza |
| <i>Lespedeza violacea</i> | violet lespedeza |
| <i>Leucanthemum lacustre</i> | Portuguese daisy |
| <i>Ligustrum sinense</i> | Chinese privet |
| <i>Lindernia dubia</i> | false pimpernel |

| Scientific Name | Common Name |
|---------------------------------|-------------------------|
| <i>Liquidambar styraciflua</i> | sweetgum |
| <i>Liriodendron tulipifera</i> | tuliptree/yellow poplar |
| <i>Litoria littorea</i> | common periwinkle |
| <i>Lobelia cardinalis</i> | cardinal flower |
| <i>Lobelia inflata</i> | Indian tobacco |
| <i>Lobelia puberula</i> | downy lobelia |
| <i>Lonicera japonica</i> | Japanese honeysuckle |
| <i>Ludwigia leptocarpa</i> | seedbox |
| <i>Luzula acuminata</i> | hairy woodrush |
| <i>Luzula bulbosa</i> | bulbous woodrush |
| <i>Lycopodium obscurum</i> | ground pine |
| <i>Lythrum lineare</i> | wand lythrum |
| <i>Malus angustifolia</i> | crabapple |
| <i>Mazus pumilus</i> | Japanese mazus |
| <i>Mecardonia acuminata</i> | axilflower |
| <i>Melia azedarach</i> | chinaberry |
| <i>Melilotus albus</i> | white sweetclover |
| <i>Melothria pendula</i> | creeping cucumber |
| <i>Microstegium vimineum</i> | Nepalese browntop |
| <i>Monotropa uniflora</i> | Indian pipe |
| <i>Morella cerifera</i> | wax myrtle |
| <i>Muscari neglectum</i> | grape hyacinth |
| <i>Myosotis arvensis</i> | field forget-me-not |
| <i>Neottia bifolia</i> | southern twayblade |
| <i>Nothoscordum bivalve</i> | false garlic |
| <i>Nuttallanthus canadensis</i> | Canada toadflax |
| <i>Nyssa sylvatica</i> | blackgum |

| Scientific Name | Common Name |
|--|----------------------------------|
| <i>Oenothera biennis</i> | common evening-primrose |
| <i>Onoclea sensibilis</i> | sensitive fern |
| <i>Osmundastrum cinnamomeum</i> | cinnamon fern |
| <i>Osmunda regalis var spectabilis</i> | royal fern |
| <i>Oxalis dillenii</i> | wood sorrel |
| <i>Oxalis stricta</i> | common yellow oxalis |
| <i>Oxalis violacea</i> | violet wood sorrell |
| <i>Oxydendrum arboreum</i> | sourwood |
| <i>Packera aurea</i> | golden ragwort |
| <i>Panicum amarum</i> | bitter panicgrass |
| <i>Paspalum dilatatum</i> | dallisgrass |
| <i>Passiflora incarnata</i> | passion flower |
| <i>Paulownia tomentosa</i> | princess tree |
| <i>Peltandra virginica</i> | green arrow arum |
| <i>Pennisetum glaucum</i> | pearl millet |
| <i>Perilla frutescens</i> | beef steak plant |
| <i>Persicaria arifolia</i> | halbred-leaved tearthumb |
| <i>Persicaria maculosa</i> | smartweed or spotted ladysthumb |
| <i>Persicaria posumbu</i> | smartweed or oriental ladysthumb |
| <i>Persicaria punctata</i> | dotted smartweed |
| <i>Persicaria sagittata</i> | arrowleaf tearthumb |
| <i>Phegopteris hexagonoptera</i> | broad beech fern |
| <i>Phragmites australis</i> | common reed |
| <i>Phyllostachys aurea</i> | golden bamboo |
| <i>Phytolacca americana</i> | American pokeweed |
| <i>Pilea fontana</i> | lesser clearweed |
| <i>Pinus echinata</i> | shortleaf pine |

| Scientific Name | Common Name |
|------------------------------------|-------------------------------|
| <i>Pinus taeda</i> | loblolly pine |
| <i>Pinus virginiana</i> | scrub pine |
| <i>Plantago lanceolata</i> | narrowleaf plantain |
| <i>Plantago major</i> | common plantain |
| <i>Platanus occidentalis</i> | American sycamore |
| <i>Pluchea odorata var odorata</i> | marsh fleabane or sweetscent |
| <i>Polystichum acrostichoides</i> | christmas fern |
| <i>Pontederia cordata</i> | pickerelweed |
| <i>Populus alba</i> | white poplar |
| <i>Potentilla canadensis</i> | dwarf cinquefoil |
| <i>Prunus serotina</i> | black cherry |
| <i>Pteridium aquilinum</i> | bracken fern |
| <i>Ptilimnium capillaceum</i> | herb william |
| <i>Quercus alba</i> | white oak |
| <i>Quercus ilicifolia</i> | bear oak |
| <i>Quercus michauxii</i> | swamp chestnut oak |
| <i>Quercus rubra</i> | red oak |
| <i>Quercus velutina</i> | black oak |
| <i>Ranunculus abortivus</i> | littleleaf buttercup |
| <i>Ranunculus bulbosus</i> | bulbous buttercup |
| <i>Ranunculus parviflorus</i> | smallflower buttercup |
| <i>Ranunculus sardous</i> | hairy buttercup |
| <i>Rhexia mariana</i> | Maryland meadowbeauty |
| <i>Rhus copallinum</i> | winged sumac |
| <i>Rhynchospora corniculata</i> | shortbristle horned beaksedge |
| <i>Robinia pseudoacacia</i> | black locust |
| <i>Rosa multiflora</i> | multiflora rose |

| Scientific Name | Common Name |
|---------------------------------------|------------------------------|
| <i>Rosa palustris</i> | swamp rose |
| <i>Rubus allegheniensis</i> | Allegheny blackberry |
| <i>Rumex conglomeratus</i> | dock |
| <i>Rumex crispus</i> | curly dock |
| <i>Sabatia angularis</i> | rosepink |
| <i>Sabatia stellaris</i> | rose of plymouth |
| <i>Salix nigra</i> | black willow |
| <i>Sambucus nigra ssp. canadensis</i> | elderberry |
| <i>Sassafras albidum</i> | sassafras |
| <i>Saururus cernuus</i> | lizards tail |
| <i>Schoenoplectus americanus</i> | chairmakers bulrush |
| <i>Schoenoplectus pungens</i> | common three square |
| <i>Scirpus atrovirens</i> | green bulrush |
| <i>Scirpus cyperinus</i> | stalked bulrush or woolgrass |
| <i>Scleranthus annuus</i> | German knotgrass |
| <i>Scutellaria integrifolia</i> | hyssop skullcap |
| <i>Sesuvium maritimum</i> | slender seapurslane |
| <i>Sherardia arvensis</i> | blue fieldmadder |
| <i>Silene latifolia</i> | bladder campion |
| <i>Sisyrinchium mucronatum</i> | common blue-eyed grass |
| <i>Smilax bona-nox</i> | catbrier |
| <i>Smilax rotundifolia</i> | common greenbrier |
| <i>Solanum carolinense</i> | Carolina horsenettle |
| <i>Solidago erecta</i> | showy goldenrod |
| <i>Solidago pinetorum</i> | small's goldenrod |
| <i>Sonchus asper</i> | spiny sowthistle |
| <i>Sorghum halepense</i> | johnsongrass |

| Scientific Name | Common Name |
|---|-------------------------------|
| <i>Spartina alterniflora</i> | smooth cordgrass |
| <i>Spartina cynosuroides</i> | big cordgrass |
| <i>Spartina patens</i> | saltmeadow cordgrass |
| <i>Strophostyles helvula</i> | trailing fuzzybean |
| <i>Symphyotrichum ericoides</i> | heath aster |
| <i>Taraxacum officinale</i> | dandelion |
| <i>Taxodium distichum</i> | bald cypress |
| <i>Teucrium canadense</i> | American germander |
| <i>Thelypteris noveboracensis</i> | marsh fern |
| <i>Tipularia discolor</i> | crippled crane-fly |
| <i>Toxicodendron radicans ssp. radicans</i> | poison ivy |
| <i>Trichostema dichotomum</i> | blue curls |
| <i>Trifolium arvense</i> | rabbit foot clover |
| <i>Trifolium campestre</i> | low hop clover |
| <i>Trifolium incarnatum</i> | crimson clover |
| <i>Trifolium pratense</i> | red clover |
| <i>Triodanis perfoliata</i> | clasping venus' looking-glass |
| <i>Tripsacum dactyloides</i> | eastern gamagrass |
| <i>Typha angustifolia</i> | narrowleaf cattail |
| <i>Typha latifolia</i> | cattail |
| <i>Ulmus americana</i> | American elm |
| <i>Uvularia sessilifolia</i> | sessile bellwort |
| <i>Vaccinium arboreum</i> | farkleberry |
| <i>Vaccinium tenellum</i> | small black blueberry |
| <i>Valerianella locusta</i> | lewiston cornsalad |
| <i>Valerianella radiata</i> | beaked cornsalad |
| <i>Verbascum blattaria</i> | moth mullein |

| Scientific Name | Common Name |
|--|-------------------------|
| <i>Verbascum thapsus</i> | common mullein |
| <i>Verbena bonariensis</i> | purpletop vervain |
| <i>Verbesina occidentalis</i> | yellow crownbeard |
| <i>Verbesina virginica</i> | white crownbeard |
| <i>Veronica peregrina</i> | neckweed |
| <i>Veronica serpyllifolia</i> | thymeleaf speedwell |
| <i>Vicia hirsuta</i> | tiny vetch |
| <i>Vicia sativa</i> | garden vetch |
| <i>Vicia sativa</i> spp. <i>nigra</i> | garden vetch |
| <i>Viola bicolor</i> | field pansy |
| <i>Viola septemloba</i> | southern coastal violet |
| <i>Viola sororia</i> var. <i>affinis</i> | sand violet |
| <i>Viola sororia</i> var. <i>sororia</i> | common blue violet |
| <i>Vitis vulpina</i> | fox grape |
| <i>Wisteria frutescens</i> | wisteria |
| <i>Woodwardia areolata</i> | netted chainfern |
| <i>Xanthium strumarium</i> | rough cocklebur |

Mammals Occurring in the Region of Influence (St. Germain 2016; Joint Base Langley Eustis-Fort Eustis et al. 2014)

| Scientific Name | Common Name |
|--|--------------------|
| <i>Blarina carolinensis carolinensis</i> | short-tailed shrew |
| <i>Canis latrans</i> | coyote |
| <i>Castor canadensis</i> | beaver |
| <i>Cryptotis parva</i> | least shrew |
| <i>Didelphis virginiana</i> | Virginia opossum |
| <i>Eptesicus fuscus</i> | big brown bat |

| Scientific Name | Common Name |
|---------------------------------------|--------------------------|
| <i>Glaucomys volans</i> | southern flying squirrel |
| <i>Lasionycteris noctivivans</i> | silver-haired bat |
| <i>Lasiurus borealis</i> | eastern red bat |
| <i>Lasiurus cinereus</i> | hoary bat |
| <i>Lontra canadensis</i> | northern river otter |
| <i>Lynx rufus</i> | bobcat |
| <i>Marmota monax</i> | groundhog |
| <i>Microtus pennsylvanicus</i> | meadow vole |
| <i>Microtus pinetorum</i> | pine vole |
| <i>Mus musculus</i> | house mouse |
| <i>Myotis austroriparius</i> | southeastern myotis |
| <i>Myotis lucifugus</i> | little brown bat |
| <i>Myotis septentrionalis</i> | northern long-eared bat |
| <i>Myotis sodalis</i> | Indiana bat |
| <i>Nycticeius humeralis</i> | evening bat |
| <i>Ochrotomys nuttalli</i> | golden mouse |
| <i>Odocoileus virginianus</i> | white-tailed deer |
| <i>Ondatra macrodon</i> | muskrat |
| <i>Oryzomys palustris</i> | marsh rice rat |
| <i>Perimyotis subflavus subflavus</i> | eastern pipistrelle |
| <i>Peromyscus gossypinus</i> | cotton mouse |
| <i>Peromyscus leucopus</i> | white-footed mouse |
| <i>Perymyotis subflavus</i> | tricolored bat |
| <i>Procyon lotor</i> | raccoon |
| <i>Scalopus aquaticus</i> | eastern mole |
| <i>Sciurus carolinensis</i> | eastern gray squirrel |

| Scientific Name | Common Name |
|--|---------------------------|
| <i>Sorex longirostris longirostris</i> | southeastern shrew |
| <i>Sylvilagus floridana mallurus</i> | eastern cottontail rabbit |
| <i>Tadarida brasiliensis</i> | Mexican free-tailed bat |
| <i>Urocyon cinereoargenteus</i> | gray fox |
| <i>Ursus americanus</i> | American black bear |
| <i>Vulpes vulpes</i> | red fox |

Birds Occuring in the Region of Influence (Priestly 2017; Olexa et al. 2013; Joint Base Langley Eustis-Fort Eustis et al. 2014)

| Scientific Name | Common Name |
|---------------------------------|---------------------|
| Order Accipitriformes | |
| <i>Accipiter cooperii</i> | Cooper's hawk |
| <i>Accipiter striatus</i> | sharp-shinned hawk |
| <i>Buteo jamaicensis</i> | red-tailed hawk |
| <i>Buteo lineatus</i> | red-shouldered hawk |
| <i>Haliaeetus leucocephalus</i> | bald eagle |
| <i>Cathartes aura</i> | turkey vulture |
| <i>Circus cyaneus</i> | northern harrier |
| <i>Falco columbarius</i> | merlin |
| <i>Falco sparverius</i> | American kestrel |
| <i>Haliaeetus leucocephalus</i> | bald eagle |
| <i>Pandion haliaetus</i> | osprey |
| Order Anseriformes | |
| <i>Aix sponsa</i> | wood duck |
| <i>Anas acuta</i> | northern pintail |
| <i>Anas americana</i> | American widgeon |

| Scientific Name | Common Name |
|------------------------------|----------------------------|
| <i>Anas clypeata</i> | northern shoveler |
| <i>Anas crecca</i> | green-winged teal |
| <i>Anas discors</i> | blue-winged teal |
| <i>Anas platyrhynchos</i> | mallard |
| <i>Anas rubripes</i> | American black duck |
| <i>Anas strepera</i> | gadwall |
| <i>Aythya affinis</i> | lesser scaup |
| <i>Aythya americana</i> | redhead |
| <i>Aythya collaris</i> | ring-necked duck |
| <i>Aythya marila</i> | greater scaup |
| <i>Aythya valisineria</i> | canvasback |
| <i>Botaurus lentiginosus</i> | American bittern |
| <i>Branta canadensis</i> | Canada goose |
| <i>Bubulcus ibis</i> | cattle egret |
| <i>Bucephala albeola</i> | bufflehead |
| <i>Bucephala clangula</i> | common goldeneye |
| <i>Clangula hyemalis</i> | oldsquaw |
| <i>Cygnus columbianus</i> | tundra swan |
| <i>Cygnus olor</i> | mute swan |
| <i>Egretta thula</i> | snowy egret |
| <i>Ixobrychus exilis</i> | least bittern |
| <i>Lophodytes cucullatus</i> | hooded merganser |
| <i>Mergus serrator</i> | red-breasted merganser |
| <i>Nyctanassa violacea</i> | yellow-crowned night-heron |
| <i>Oxyura jamaicensis</i> | ruddy duck |
| Order Apodiformes | |

| Scientific Name | Common Name |
|-------------------------------------|---------------------------|
| <i>Archilochus colubris</i> | ruby-throated hummingbird |
| <i>Chaetura pelagica</i> | chimney swift |
| Order Ciconiiformes | |
| <i>Ardea alba</i> | great egret |
| <i>Ardea herodias</i> | great blue heron |
| <i>Butorides striata</i> | green heron |
| Order Coraciiformes | |
| <i>Ceryle alcyon</i> | belted kingfisher |
| Order Charadriiformes | |
| <i>Actitis macularius</i> | spotted sandpiper |
| <i>Arenaria interpres</i> | ruddy turnstone |
| <i>Calidris alba</i> | sanderling |
| <i>Calidris alpina</i> | dunlin |
| <i>Calidris fuscicollis</i> | white-rumped sandpiper |
| <i>Calidris himantopus</i> | stilt sandpiper |
| <i>Calidris mauri</i> | western sandpiper |
| <i>Calidris melanotos</i> | pectoral sandpiper |
| <i>Calidris minutilla</i> | least sandpiper |
| <i>Calidris pusilla</i> | semipalmated sandpiper |
| <i>Charadrius semipalmatus</i> | semipalmated plover |
| <i>Charadrius vociferus</i> | killdeer |
| <i>Chlidonias niger</i> | black tern |
| <i>Chroicocephalus philidelphia</i> | Bonaparte's gull |
| <i>Gallinago gallinago</i> | common snipe |
| <i>Hydroprogne caspia</i> | caspian tern |
| <i>Larus delawarensis</i> | ring-billed gull |

| Scientific Name | Common Name |
|--------------------------------|--------------------------|
| <i>Larus fuscus</i> | lesser black-backed gull |
| <i>Larus marinus</i> | great black-backed gull |
| <i>Leucophaeus atricilla</i> | laughing gull |
| <i>Limnodromus griseus</i> | short-billed dowitcher |
| <i>Limnodromus scolopaceus</i> | long-billed dowitcher |
| <i>Phalaropus tricolor</i> | Wilson's phalarope |
| <i>Porzana Carolina</i> | sora rail |
| <i>Rallus limicola</i> | Virginia rail |
| <i>Rallus longirostris</i> | clapper rail |
| <i>Scolopax minor</i> | American woodcock |
| <i>Sterna forsteri</i> | Forster's tern |
| <i>Sterna hirundo</i> | common tern |
| <i>Thalasseus maximus</i> | royal tern |
| <i>Tringa flavipes</i> | lesser yellowlegs |
| <i>Tringa melanoleuca</i> | greater yellowlegs |
| <i>Tringa solitaria</i> | solitary sandpiper |
| Order Columbiformes | |
| <i>Columba livia</i> | rock dove |
| <i>Zenaida macroura</i> | mourning dove |
| Order Cuculiformes | |
| <i>Coccyzus americanus</i> | yellow-billed cuckoo |
| Order Falconiformes | |
| <i>Falco sparverius</i> | American kestrel |
| Order Galliformes | |
| <i>Colinus virginianus</i> | northern bobwhite |
| <i>Gallinula chloropus</i> | common moorhen |

| Scientific Name | Common Name |
|-------------------------------|----------------------|
| <i>Meleagris gallopavo</i> | wild turkey |
| Order Gaviiformes | |
| <i>Gavia immer</i> | common loon |
| Order Passeriformes | |
| <i>Agelaius phoeniceus</i> | red-winged blackbird |
| <i>Ammodramus leconteii</i> | LeConte's sparrow |
| <i>Baeolophus bicolor</i> | tufted titmouse |
| <i>Bombycilla cedrorum</i> | cedar waxwing |
| <i>Cardellina pusilla</i> | Wilson's warbler |
| <i>Cardinalis cardinalis</i> | northern cardinal |
| <i>Catharus guttatus</i> | hermit thrush |
| <i>Certhia americana</i> | brown creeper |
| <i>Cistothorus palustris</i> | marsh wren |
| <i>Cistothorus platensis</i> | sedge wren |
| <i>Coccyzus americanus</i> | yellow-billed cuckoo |
| <i>Corvus brachyrhynchos</i> | American crow |
| <i>Corvus ossifragus</i> | fish crow |
| <i>Cyanocitta cristata</i> | blue jay |
| <i>Dactylis glomerata</i> | orchard grass |
| <i>Dumetella carolinensis</i> | gray catbird |
| <i>Euphagus carolinus</i> | rusty blackbird |
| <i>Geothlypis trichas</i> | common yellowthroat |
| <i>Haemorhous mexicanus</i> | house finch |
| <i>Haemorhous purpureus</i> | purple finch |
| <i>Hirundo rustica</i> | barn swallow |
| <i>Hylocichla mustelina</i> | wood thrush |

| Scientific Name | Common Name |
|----------------------------------|--------------------------|
| <i>Icteria virens</i> | yellow-breasted chat |
| <i>Icterus galbula</i> | Baltimore oriole |
| <i>Icterus spurius</i> | orchard oriole |
| <i>Junco hyemalis</i> | dark-eyed junco |
| <i>Leiothlypis celata</i> | orange-crowned warbler |
| <i>Melospiza georgiana</i> | swamp sparrow |
| <i>Melospiza melodia</i> | song sparrow |
| <i>Mimus polyglottos</i> | northern mockingbird |
| <i>Mniotilta varia</i> | black-and-white warbler |
| <i>Molothrus ater</i> | brown-headed cowbird |
| <i>Myiarchus crinitus</i> | great crested flycatcher |
| <i>Parkesia noveboracensis</i> | northern waterthrush |
| <i>Passer domesticus</i> | house sparrow |
| <i>Passerculus sandwichensis</i> | savannah sparrow |
| <i>Passerella iliaca</i> | fox sparrow |
| <i>Passerina caerulea</i> | blue grosbeak |
| <i>Passerina cyanea</i> | indigo bunting |
| <i>Pheucticus ludovicianus</i> | rose-breasted grosbeak |
| <i>Pipilo erythrophthalmus</i> | eastern towhee |
| <i>Piranga olivacea</i> | scarlet tanager |
| <i>Piranga rubra</i> | summer tanager |
| <i>Poecile atricapillus</i> | black-capped chickadee |
| <i>Poecile carolinensis</i> | Carolina chickadee |
| <i>Polioptila caerulea</i> | blue-gray gnatcatcher |
| <i>Pooecetes gramineus</i> | vesper sparrow |
| <i>Progne subis</i> | purple martin |

| Scientific Name | Common Name |
|-----------------------------------|-------------------------------|
| <i>Protonotaria citrea</i> | prothonotary warbler |
| <i>Quiscalus quiscula</i> | common grackle |
| <i>Regulus calendula</i> | ruby-crowned kinglet |
| <i>Riparia riparia</i> | bank swallow |
| <i>Sayornis phoebe</i> | eastern phoebe |
| <i>Seiurus aurocapilla</i> | ovenbird |
| <i>Setophaga pinus</i> | pine warbler |
| <i>Setophaga aestiva</i> | yellow warbler |
| <i>Setophaga americana</i> | northern parula |
| <i>Setophaga caerulescens</i> | black-throated blue warbler |
| <i>Setophaga coronata</i> | yellow-rumped warbler |
| <i>Setophaga discolor</i> | prairie warbler |
| <i>Setophaga dominica</i> | yellow-throated warbler |
| <i>Setophaga magnolia</i> | magnolia warbler |
| <i>Setophaga palmarum</i> | palm warbler |
| <i>Setophaga ruticilla</i> | American redstart |
| <i>Setophaga striata</i> | blackpoll warbler |
| <i>Sialis sialis</i> | eastern bluebird |
| <i>Sitta canadensis</i> | red-breasted nuthatch |
| <i>Sitta pusilla</i> | brown-headed nuthatch |
| <i>Spinus pinus</i> | pine siskin |
| <i>Spinus tristis</i> | American goldfinch |
| <i>Spizella passerina</i> | chipping sparrow |
| <i>Spizella pusilla</i> | field sparrow |
| <i>Stelgidopteryx serripennis</i> | northern rough-winged swallow |
| <i>Sturnus vulgaris</i> | European starling |

| Scientific Name | Common Name |
|-----------------------------------|----------------------------|
| <i>Tachycineta bicolor</i> | tree swallow |
| <i>Thryothorus ludovicianus</i> | Carolina wren |
| <i>Toxostoma rufum</i> | brown thrasher |
| <i>Troglodytes aedon</i> | house wren |
| <i>Troglodytes troglodytes</i> | winter wren |
| <i>Turdus migratorius</i> | American robin |
| <i>Tyrannus tyrannus</i> | eastern kingbird |
| <i>Vireo griseus</i> | white-eyed vireo |
| <i>Vireo olivaceus</i> | red-eyed vireo |
| <i>Vireo solitarius</i> | solitary vireo |
| <i>Zonotrichia leucophrys</i> | white-crowned sparrow |
| Order Pelecaniformes | |
| <i>Egretta thula</i> | snowy egret |
| <i>Nyctanassa violacea</i> | yellow-crowned night heron |
| <i>Phalacrocorax auritis</i> | double-crested cormorant |
| <i>Podiceps auritus</i> | horned grebe |
| <i>Podiceps grisegena</i> | red-necked grebe |
| <i>Podilymbus podiceps</i> | pieb-billed grebe |
| Order Piciformes | |
| <i>Colaptes auratus</i> | northern flicker |
| <i>Dryocopus pileatus</i> | pileated woodpecker |
| <i>Melanerpes erythrocephalus</i> | red-headed woodpecker |
| <i>Picoides villosus</i> | hairy woodpecker |
| <i>Picoides pubescens</i> | downy woodpecker |
| <i>Melanerpes carolinus</i> | red-bellied woodpecker |
| <i>Sphyrapicus varius</i> | yellow-bellied sapsucker |

| Scientific Name | Common Name |
|------------------------------|--------------------------|
| Order Suliformes | |
| <i>Phalacrocorax auritus</i> | double-crested cormorant |
| Order Strigiformes | |
| <i>Bubo virginianus</i> | great horned owl |
| <i>Strix varia</i> | barred owl |
| <i>Megascops asio</i> | eastern screech owl |

Fish Occurring in the Region of Influence (Joint Base Langley Eustis-Fort Eustis et al. 2014)

| Scientific Name | Common Name |
|-------------------------------------|--------------------|
| <i>Ameiurus catus</i> | white catfish |
| <i>Ameiurus melas</i> | black bullhead |
| <i>Ameiurus nebulosus</i> | brown bullhead |
| <i>Ameriurus natalis</i> | yellow bullhead |
| <i>Amia calva</i> | bowfin |
| <i>Anchoa hepsetus</i> | striped anchovy |
| <i>Anchoa mitchilli</i> | bay anchovy |
| <i>Anguilla rostrata</i> | American eel |
| <i>Aphredoderus sayanus sayanus</i> | pirate perch |
| <i>Brevoortia tyrannus</i> | Atlantic menhaden |
| <i>Chaetodipterus faber</i> | Atlantic spadefish |
| <i>Cynoscion regalis</i> | weakfish |
| <i>Cyprinus carpio</i> | common carp |
| <i>Dorosoma cepedianum</i> | gizzard shad |
| <i>Fundulus majalis</i> | striped killifish |
| <i>Gambusia affinis</i> | mosquitofish |
| <i>Ictalurus punctatus</i> | channel catfish |

| Scientific Name | Common Name |
|--------------------------------|-------------------------|
| <i>Leiostomus xanthurus</i> | spot |
| <i>Lepomis gibbosus</i> | pumpkinseed |
| <i>Lepomis macrochirus</i> | bluegill |
| <i>Lepomis microlophus</i> | red ear sunfish |
| <i>Membras martinica</i> | rough silverside |
| <i>Menidia beryllina</i> | inland silverside |
| <i>Menidia menidia</i> | Atlantic silverside |
| <i>Menticirrhus saxatilis</i> | northern kingfish |
| <i>Micropogonias undulatus</i> | Atlantic croaker |
| <i>Micropterus salmoides</i> | largemouth bass |
| <i>Morone americana</i> | white perch |
| <i>Morone saxatilis</i> | striped bass |
| <i>Mugil cephalus</i> | striped mullet |
| <i>Mugil curema</i> | white mullet |
| <i>Notemigonus crysoleucas</i> | golden shiner |
| <i>Opisthonema oglinum</i> | Atlantic thread herring |
| <i>Pomatomus saltatrix</i> | bluefish |
| <i>Pomoxis annularis</i> | white crappie |
| <i>Pomoxis nigromaculatus</i> | black crappie |
| <i>Strongylura marina</i> | Atlantic needlefish |
| <i>Symphurus plagiusa</i> | blackcheek tonguefish |
| <i>Synodus foetens</i> | inshore lizardfish |
| <i>Trinectes maculatus</i> | hogchokeer |

Shellfish Occuring in the Region of Influence (Joint Base Langley Eustis-Fort Eustis et al. 2014)

| Scientific Name | Common Name |
|-----------------------------------|-------------------------|
| <i>Callinectes sapidus</i> | blue crab |
| <i>Cambarus bartonii bartonii</i> | crayfish |
| <i>Cambarus robustus</i> | crayfish |
| <i>Crassostrea virginica</i> | eastern oyster |
| <i>Elliptio complanata</i> | eastern elliptio mussle |
| <i>Orconectes immunis</i> | crayfish |
| <i>Pyganodon cataracta</i> | eastern floater muscle |

Amphibians and Reptiles Occurring in the Region of Influence (Joint Base Langley Eustis-Fort Eustis et al. 2014)

| Scientific Name | Common Name |
|---------------------------------------|-----------------------------|
| Amphibians | |
| Frogs and Toads | |
| <i>Acris spp.</i> | eastern cricket frog |
| <i>Anaxyrus americanus americanus</i> | American toad |
| <i>Anaxyrus fowleri</i> | Fowler's toad |
| <i>Gastrophryne carolinensis</i> | eastern narrow-mouthed toad |
| <i>Hyla chrysoscelis</i> | Cope's gray treefrog |
| <i>Hyla cinerea</i> | green treefrog |
| <i>Lithobates catesbeianus</i> | American bullfrog |
| <i>Lithobates clamitans</i> | green frog |
| <i>Lithobates palustris</i> | pickerel frog |
| <i>Lithobates sphenoccephalus</i> | southern leopard frog |
| <i>Pseudacris crucifer</i> | northern spring peeper |
| <i>Pseudacris feriarum</i> | upland chorus frog |

| Scientific Name | Common Name |
|--|---|
| Salamanders | |
| <i>Ambystoma opacum</i> | marbled salamander |
| <i>Notophthalmus viridescens</i> | red-spotted newt |
| <i>Plethodon cinereus</i> | red-backed salamander (red & lead-phases) |
| Reptiles | |
| Lizards | |
| <i>Eumeces fasciatus</i> | five-lined skink |
| <i>Scincella lateralis</i> | ground skink |
| Snakes | |
| <i>Coluber constrictor constrictor</i> | northern black racer |
| <i>Elaphe alleghaniensis</i> | eastern ratsnake |
| <i>Nerodia sipedon</i> | northern water snake |
| <i>Opheodrys aestivus</i> | rough green snake |
| <i>Thamnophis sirtalis</i> | common garter snake |
| Turtles | |
| <i>Chelydra serpentine serpentina</i> | common snapping turtle |
| <i>Chrysemys picta picta</i> | painted turtle |
| <i>Clemmys guttata</i> | spotted turtle |
| <i>Kinosternon subrubrum</i> | eastern mud turtle |
| <i>Malaclemys terrapin terrapin</i> | diamond-back terrapin |
| <i>Psudemys rubriventris</i> | red-bellied cooter |
| <i>Sternotherus odoratus</i> | musk turtle (stinkpot) |
| <i>Trachemys scripta</i> | yellow-bellied slider |
| <i>Terrapene carolina carolina</i> | eastern box turtle |
| <i>Trachemys scripta elegans</i> | red-eared slider |

VaFWIS Search Report Compiled on 4/28/2017, 4:40:10 PM

Known or likely to occur within a **3 mile radius around point Fort Eustis Military Newport News city**
(at 37,08,19.3 -76,35,20.6)

in **095 James City County, 700 Newport News City, VA**

[View Map of Site Location](#)

540 Known or Likely Species ordered by Status Concern for Conservation

| <u>BOVA Code</u> | <u>Status*</u> | <u>Tier**</u> | <u>Common Name</u> | <u>Scientific Name</u> |
|------------------|----------------|---------------|--|-----------------------------------|
| 030074 | FESE | Ia | <u>Turtle, Kemp's ridley sea</u> | Lepidochelys kempii |
| 010032 | FESE | Ib | <u>Sturgeon, Atlantic</u> | Acipenser oxyrinchus |
| 030075 | FESE | Ic | <u>Turtle, leatherback sea</u> | Dermochelys coriacea |
| 030071 | FTST | Ia | <u>Turtle, loggerhead sea</u> | Caretta caretta |
| 040144 | FTST | Ia | <u>Knot, red</u> | Calidris canutus rufa |
| 050022 | FTST | Ia | <u>Bat, northern long-eared</u> | Myotis septentrionalis |
| 040120 | FTST | IIa | <u>Plover, piping</u> | Charadrius melodus |
| 040110 | SE | Ia | <u>Rail, black</u> | Laterallus jamaicensis |
| 050020 | SE | Ia | <u>Bat, little brown</u> | Myotis lucifugus lucifugus |
| 050034 | SE | Ia | <u>Bat, Rafinesque's eastern big-eared</u> | Corynorhinus rafinesquii macrotis |
| 050027 | SE | Ia | <u>Bat, tri-colored</u> | Perimyotis subflavus |
| 020052 | SE | IIa | <u>Salamander, eastern tiger</u> | Ambystoma tigrinum |
| 030013 | SE | IIa | <u>Rattlesnake, canebrake</u> | Crotalus horridus |
| 040096 | ST | Ia | <u>Falcon, peregrine</u> | Falco peregrinus |
| 040293 | ST | Ia | <u>Shrike, loggerhead</u> | Lanius ludovicianus |
| 040379 | ST | Ia | <u>Sparrow, Henslow's</u> | Ammodramus henslowii |
| 020044 | ST | IIa | <u>Salamander, Mabee's</u> | Ambystoma mabeei |
| 020002 | ST | IIa | <u>Treefrog, barking</u> | Hyla gratiosa |
| 040292 | ST | | <u>Shrike, migrant loggerhead</u> | Lanius ludovicianus migrans |
| 030067 | CC | IIa | <u>Terrapin, northern diamond-backed</u> | Malaclemys terrapin terrapin |

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| 030063 | CC | IIIa | <u>Turtle, spotted</u> | Clemmys guttata |
| 010077 | | Ia | <u>Shiner, bridge</u> | Notropis bifrenatus |
| 040040 | | Ia | <u>Ibis, glossy</u> | Plegadis falcinellus |
| 020063 | | IIa | <u>Toad, oak</u> | Anaxyrus quercicus |
| 040052 | | IIa | <u>Duck, American black</u> | Anas rubripes |
| 040033 | | IIa | <u>Egret, snowy</u> | Egretta thula |
| 040029 | | IIa | <u>Heron, little blue</u> | Egretta caerulea caerulea |
| 040036 | | IIa | <u>Night-heron, yellow-crowned</u> | Nyctanassa violacea violacea |
| 040192 | | IIa | <u>Skimmer, black</u> | Rynchops niger |
| 040181 | | IIa | <u>Tern, common</u> | Sterna hirundo |
| 040320 | | IIa | <u>Warbler, cerulean</u> | Setophaga cerulea |
| 040140 | | IIa | <u>Woodcock, American</u> | Scolopax minor |
| 040203 | | IIb | <u>Cuckoo, black-billed</u> | Coccyzus erythrophthalmus |
| 040105 | | IIb | <u>Rail, king</u> | Rallus elegans |
| 040304 | | IIc | <u>Warbler, Swainson's</u> | Limnothlypis swainsonii |
| 100003 | | IIc | <u>Skipper, rare</u> | Problema bulenta |
| 010131 | | IIIa | <u>Eel, American</u> | Anguilla rostrata |
| 020082 | | IIIa | <u>Siren, eastern lesser</u> | Siren intermedia intermedia |
| 030068 | | IIIa | <u>Turtle, woodland box</u> | Terrapene carolina carolina |
| 040037 | | IIIa | <u>Bittern, least</u> | Ixobrychus exilis exilis |
| 040100 | | IIIa | <u>Bobwhite, northern</u> | Colinus virginianus |
| 040046 | | IIIa | <u>Brant</u> | Branta bernicla brota |
| 040202 | | IIIa | <u>Cuckoo, yellow-billed</u> | Coccyzus americanus |
| 040094 | | IIIa | <u>Harrier, northern</u> | Circus cyaneus |
| 040035 | | IIIa | <u>Night-heron, black-crowned</u> | Nycticorax nycticorax hoactii |
| 040204 | | IIIa | <u>Owl, barn</u> | Tyto alba pratincola |
| 040418 | | IIIa | <u>Sparrow, Nelson's</u> | Ammodramus nelsoni |
| 040381 | | IIIa | <u>Sparrow, saltmarsh</u> | Ammodramus caudacutus |
| 040180 | | IIIa | <u>Tern, Forster's</u> | Sterna forsteri |
| 040186 | | IIIa | <u>Tern, least</u> | Sterna antillarum |
| 040333 | | IIIa | <u>Warbler, Kentucky</u> | Geothlypis formosa |
| 040215 | | IIIa | <u>Whip-poor-will, Eastern</u> | Antrostomus vociferus |

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| 040133 | | IIIa | <u>Willet</u> | Catoptrophorus semipalmatus semipalmatus |
| 050061 | | IIIa | <u>Squirrel, Southeastern fox</u> | Sciurus niger niger |
| 100079 | | IIIa | <u>Butterfly, monarch</u> | Danaus plexippus |
| 040220 | | IIIb | <u>Kingfisher, belted</u> | Ceryle alcyon |
| 010375 | | IIIc | <u>Shiner, ironcolor</u> | Notropis chalybaeus |
| 030035 | | IIIc | <u>Swampsnake, eastern glossy</u> | Liodytes rigida rigida |
| 040247 | | IIIc | <u>Swallow, bank</u> | Riparia riparia |
| 100002 | | IIIc | <u>Skipper, Duke's (or scarce swamp)</u> | Euphyes dukesi |
| 010038 | | IVa | <u>Herring, alewife</u> | Alosa pseudoharengus |
| 010045 | | IVa | <u>Herring, blueback</u> | Alosa aestivalis |
| 010040 | | IVa | <u>Shad, American</u> | Alosa sapidissima |
| 020010 | | IVa | <u>Frog, little grass</u> | Pseudacris ocularis |
| 020069 | | IVa | <u>Salamander, eastern mud</u> | Pseudotriton montanus montanus |
| 020058 | | IVa | <u>Siren, greater</u> | Siren lacertina |
| 030009 | | IVa | <u>Lizard, eastern slender glass</u> | Ophisaurus attenuatus longicaudus |
| 030045 | | IVa | <u>Ribbonsnake, common</u> | Thamnophis sauritus sauritus |
| 030017 | | IVa | <u>Scarletsnake, northern</u> | Cemophora coccinea copei |
| 030046 | | IVa | <u>Snake, common rainbow</u> | Farancia erythrogramma erythrogramma |
| 040272 | | IVa | <u>Catbird, gray</u> | Dumetella carolinensis |
| 040337 | | IVa | <u>Chat, yellow-breasted</u> | Icteria virens virens |
| 040142 | | IVa | <u>Dowitcher, short-billed</u> | Limnodromus griseus |
| 040154 | | IVa | <u>Dunlin</u> | Calidris alpina hudsonia |
| 040126 | | IVa | <u>Godwit, marbled</u> | Limosa fedoa |
| 040173 | | IVa | <u>Gull, laughing</u> | Leucophaeus atricilla |
| 040229 | | IVa | <u>Kingbird, eastern</u> | Tyrannus tyrannus |
| 040003 | | IVa | <u>Loon, red-throated</u> | Gavia stellata |
| 040344 | | IVa | <u>Meadowlark, eastern</u> | Sturnella magna |
| 040054 | | IVa | <u>Pintail, northern</u> | Anas acuta acuta |
| 040123 | | IVa | <u>Plover, black-bellied</u> | Pluvialis squatarola |

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| 040106 | | IVa | <u>Rail, clapper</u> | Rallus crepitans |
| 040107 | | IVa | <u>Rail, Virginia</u> | Rallus limicola |
| 040145 | | IVa | <u>Sanderling</u> | Calidris alba |
| 040065 | | IVa | <u>Scaup, greater</u> | Aythya marila |
| 040391 | | IVa | <u>Sparrow, field</u> | Spizella pusilla |
| 040378 | | IVa | <u>Sparrow, grasshopper</u> | Ammodramus savannarum pratensis |
| 040382 | | IVa | <u>Sparrow, seaside</u> | Ammodramus maritimus |
| 040187 | | IVa | <u>Tern, royal</u> | Sterna maxima maximus |
| 040273 | | IVa | <u>Thrasher, brown</u> | Toxostoma rufum |
| 040375 | | IVa | <u>Towhee, eastern</u> | Pipilo erythrophthalmus |
| 040302 | | IVa | <u>Warbler, black-and-white</u> | Mniotilta varia |
| 040127 | | IVa | <u>Whimbrel</u> | Numenius phaeopus |
| 040269 | | IVa | <u>Wren, marsh</u> | Cistothorus palustris |
| 050029 | | IVa | <u>Bat, eastern red</u> | Lasiurus borealis borealis |
| 050030 | | IVa | <u>Bat, hoary</u> | Lasiurus cinereus cinereus |
| 050025 | | IVa | <u>Bat, silver-haired</u> | Lasionycteris noctivagans |
| 050075 | | IVa | <u>Mouse, cotton</u> | Peromyscus gossypinus gossypinus |
| 050131 | | IVa | <u>Myotis, southeastern</u> | Myotis austroriparius |
| 050107 | | IVa | <u>Rabbit, marsh</u> | Sylvilagus palustris palustris |
| 060157 | | IVa | <u>Floater, Alewife</u> | Anodonta implicata |
| 030058 | | IVb | <u>Slider, yellow-bellied</u> | Trachemys scripta scripta |
| 030050 | | IVb | <u>Turtle, snapping</u> | Chelydra serpentina |
| 040349 | | IVb | <u>Blackbird, rusty</u> | Euphagus carolinus |
| 040221 | | IVb | <u>Flicker, northern</u> | Colaptes auratus |
| 040028 | | IVb | <u>Heron, green</u> | Butorides virescens |
| 040243 | | IVb | <u>Pewee, eastern wood</u> | Contopus virens |
| 040217 | | IVb | <u>Swift, chimney</u> | Chaetura pelagica |
| 040277 | | IVb | <u>Thrush, wood</u> | Hylocichla mustelina |
| 040340 | | IVb | <u>Warbler, Canada</u> | Cardellina canadensis |
| 060184 | | IVb | <u>Mussel, northern lance</u> | Elliptio fisheriana |
| 010359 | | IVc | <u>Lamprey, American brook</u> | Lampetra appendix |
| 010001 | | IVc | <u>Lamprey, least brook</u> | Lampetra aepyptera |

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| 010128 | | IVc | <u>Madtom, tadpole</u> | Noturus gyrinus |
| 010179 | | IVc | <u>Sunfish, banded</u> | Enneacanthus obesus |
| 020087 | | IVc | <u>Frog, southern chorus</u> | Pseudacris nigrita |
| 020061 | | IVc | <u>Spadefoot, eastern</u> | Scaphiopus holbrookii |
| 030024 | | IVc | <u>Snake, eastern hog-nosed</u> | Heterodon platirhinos |
| 030043 | | IVc | <u>Snake, southeastern crowned</u> | Tantilla coronata |
| 040153 | | IVc | <u>Sandpiper, purple</u> | Calidris maritima |
| 040248 | | IVc | <u>Swallow, northern rough-winged</u> | Stelgidopteryx serripennis |
| 060118 | | IVc | <u>Snail, sharp sprite</u> | Promenetus exacuus |
| 100001 | | IVc | <u>fritillary, Diana</u> | Speyeria diana |
| 010049 | | | <u>Anchovy, bay</u> | Anchoa mitchilli |
| 010188 | | | <u>Bass, largemouth</u> | Micropterus salmoides |
| 010186 | | | <u>Bass, smallmouth</u> | Micropterus dolomieu |
| 010187 | | | <u>Bass, spotted</u> | Micropterus punctulatus |
| 010168 | | | <u>Bass, striped</u> | Morone saxatilis |
| 010167 | | | <u>Bass, white</u> | Morone chrysops |
| 010183 | | | <u>Bluegill</u> | Lepomis macrochirus |
| 010034 | | | <u>Bowfin</u> | Amia calva |
| 010121 | | | <u>Bullhead, black</u> | Ameiurus melas |
| 010123 | | | <u>Bullhead, brown</u> | Ameiurus nebulosus |
| 010122 | | | <u>Bullhead, yellow</u> | Ameiurus natalis |
| 010062 | | | <u>Carp, common</u> | Cyprinus carpio |
| 010390 | | | <u>Catfish, blue</u> | Ictalurus furcatus |
| 010125 | | | <u>Catfish, channel</u> | Ictalurus punctatus |
| 010130 | | | <u>Catfish, flathead</u> | Pylodictis olivaris |
| 010120 | | | <u>Catfish, white</u> | Ameiurus catus |
| 010373 | | | <u>Chub, bull</u> | Nocomis raneyi |
| 010103 | | | <u>Chub, creek</u> | Semotilus atromaculatus |
| 010106 | | | <u>Chubsucker, creek</u> | Erimyzon oblongus |
| 010190 | | | <u>Crappie, black</u> | Pomoxis nigromaculatus |
| 010189 | | | <u>Crappie, white</u> | Pomoxis annularis |
| 010250 | | | <u>Croaker, Atlantic</u> | Micropogonias undulatus |
| 010366 | | | <u>Dace, rosyside</u> | Clinostomus funduloides |

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| 010397 | | <u>Darter, tessellated</u> | Etheostoma olmstedii |
| 010176 | | <u>Flier</u> | Centrarchus macropterus |
| 010033 | | <u>Gar, longnose</u> | Lepisosteus osseus |
| 010312 | | <u>Hogchoker</u> | Trinectes maculatus |
| 010143 | | <u>Killifish, banded</u> | Fundulus diaphanus |
| 010142 | | <u>Killifish, marsh</u> | Fundulus confluentus |
| 010146 | | <u>Killifish, striped</u> | Fundulus majalis |
| 010002 | | <u>Lamprey, sea</u> | Petromyzon marinus |
| 010129 | | <u>Madtom, margined</u> | Noturus insignis |
| 010043 | | <u>Menhaden, Atlantic</u> | Brevoortia tyrannus |
| 010408 | | <u>Minnow, eastern silvery</u> | Hybognathus regius |
| 010140 | | <u>Minnow, sheepshead</u> | Cyprinodon variegatus |
| 010148 | | <u>Mosquitofish, eastern</u> | Gambusia holbrooki |
| 010054 | | <u>Mudminnow, eastern</u> | Umbra pygmaea |
| 010299 | | <u>Mullet, striped</u> | Mugil cephalus |
| 010144 | | <u>Mummichog</u> | Fundulus heteroclitus |
| 010163 | | <u>Perch, pirate</u> | Aphredoderus sayanus sayanus |
| 010241 | | <u>Perch, silver</u> | Bairdiella chrysoura |
| 010166 | | <u>Perch, white</u> | Morone americana |
| 010206 | | <u>Perch, yellow</u> | Perca flavescens |
| 010056 | | <u>Pickereel, chain</u> | Esox niger |
| 010055 | | <u>Pickereel, redfin</u> | Esox americanus americanus |
| 010364 | | <u>Pike, northern</u> | Esox lucius |
| 010182 | | <u>Pumpkinseed</u> | Lepomis gibbosus |
| 010116 | | <u>Redhorse, shorthead</u> | Moxostoma macrolepidotum |
| 010041 | | <u>Shad, gizzard</u> | Dorosoma cepedianum |
| 010039 | | <u>Shad, hickory</u> | Alosa mediocris |
| 010042 | | <u>Shad, threadfin</u> | Dorosoma petenense |
| 010080 | | <u>Shiner, common</u> | Luxilus cornutus |
| 010068 | | <u>Shiner, golden</u> | Notemigonus crysoleucas |
| 010073 | | <u>Shiner, satinfin</u> | Cyprinella analostana |
| 010082 | | <u>Shiner, spottail</u> | Notropis hudsonius |
| 010086 | | <u>Shiner, swallowtail</u> | Notropis procne |

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| 010303 | | | <u>Silverside, Atlantic</u> | Menidia menidia |
| 010302 | | | <u>Silverside, inland</u> | Menidia beryllina |
| 010301 | | | <u>Silverside, rough</u> | Membras martinica |
| 010246 | | | <u>Spot</u> | Leiostomus xanthurus |
| 010157 | | | <u>Stickleback, threespine</u> | Gasterosteus aculeatus |
| 010178 | | | <u>Sunfish, bluespotted</u> | Enneacanthus gloriosus |
| 010454 | | | <u>Sunfish, Genus = Lepomis</u> | Lepomis sp. |
| 010181 | | | <u>Sunfish, green</u> | Lepomis cyanellus |
| 010180 | | | <u>Sunfish, redbreast</u> | Lepomis auritus |
| 010185 | | | <u>Sunfish, redear</u> | Lepomis microlophus |
| 010177 | | | <u>Warmouth</u> | Lepomis gulosus |
| 010245 | | | <u>Weakfish</u> | Cynoscion regalis |
| 020001 | | | <u>Amphiuma, two-toed</u> | Amphiuma means |
| 020004 | | | <u>Bullfrog, American</u> | Lithobates catesbeianus |
| 020003 | | | <u>Frog, Brimley's chorus</u> | Pseudacris brimleyi |
| 020012 | | | <u>Frog, eastern cricket</u> | Acris crepitans |
| 020008 | | | <u>Frog, green</u> | Lithobates clamitans |
| 020013 | | | <u>Frog, pickerel</u> | Lithobates palustris |
| 020015 | | | <u>Frog, southern cricket</u> | Acris gryllus |
| 020016 | | | <u>Frog, southern leopard</u> | Lithobates sphenoccephalus utricularius |
| 020018 | | | <u>Frog, upland chorus</u> | Pseudacris feriarum |
| 020065 | | | <u>Newt, red-spotted</u> | Notophthalmus viridescens viridescens |
| 020071 | | | <u>Peeper, spring</u> | Pseudacris crucifer |
| 020084 | | | <u>Salamander, Atlantic Coast Slimy</u> | Plethodon chlorobryonis |
| 020043 | | | <u>Salamander, eastern red-backed</u> | Plethodon cinereus |
| 020029 | | | <u>Salamander, four-toed</u> | Hemidactylium scutatum |
| 020035 | | | <u>Salamander, marbled</u> | Ambystoma opacum |
| 020038 | | | <u>Salamander, northern dusky</u> | Desmognathus fuscus |
| 020070 | | | <u>Salamander, northern red</u> | Pseudotriton ruber ruber |

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| 020048 | | | <u>Salamander, southern dusky</u> | Desmognathus auriculatus |
| 020050 | | | <u>Salamander, southern two-lined</u> | Eurycea cirrigera |
| 020049 | | | <u>Salamander, spotted</u> | Ambystoma maculatum |
| 020051 | | | <u>Salamander, three-lined</u> | Eurycea guttolineata |
| 020080 | | | <u>Salamander, white-spotted slimy</u> | Plethodon cylindraceus |
| 020059 | | | <u>Toad, eastern American</u> | Anaxyrus americanus americanus |
| 020060 | | | <u>Toad, eastern narrow-mouthed</u> | Gastrophryne carolinensis |
| 020062 | | | <u>Toad, Fowler's</u> | Anaxyrus fowleri |
| 020064 | | | <u>Toad, southern</u> | Anaxyrus terrestris |
| 020006 | | | <u>Treefrog, Cope's gray</u> | Hyla chrysoscelis |
| 020009 | | | <u>Treefrog, green</u> | Hyla cinerea |
| 020014 | | | <u>Treefrog, pine woods</u> | Hyla femoralis |
| 020017 | | | <u>Treefrog, squirrel</u> | Hyla squirella |
| 030083 | | | <u>Blindsnake, Brahminy</u> | Ramphotyphlops braminus |
| 030041 | | | <u>Brownsnake, northern</u> | Storeria dekayi dekayi |
| 030059 | | | <u>Cooter, eastern river</u> | Pseudemys concinna concinna |
| 030057 | | | <u>Cooter, northern red-bellied</u> | Pseudemys rubriventris |
| 030016 | | | <u>Copperhead, northern</u> | Agkistrodon contortrix mokasen |
| 030022 | | | <u>Cornsnake, red</u> | Pantherophis guttatus |
| 030015 | | | <u>Cottonmouth, eastern</u> | Agkistrodon piscivorus piscivorus |
| 030049 | | | <u>Earthsnake, eastern smooth</u> | Virginia valeriae valeriae |
| 030047 | | | <u>Earthsnake, rough</u> | Haldea striatula |
| 030044 | | | <u>Gartersnake, eastern</u> | Thamnophis sirtalis sirtalis |
| 030038 | | | <u>Greensnake, northern rough</u> | Opheodrys aestivus aestivus |
| 030026 | | | <u>Kingsnake, eastern</u> | Lampropeltis getula |

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| 030027 | | | <u>Kingsnake, mole</u> | Lampropeltis calligaster rhombomaculata |
| 030002 | | | <u>Lizard, eastern fence</u> | Sceloporus undulatus |
| 030029 | | | <u>Milksnake, eastern</u> | Lampropeltis triangulum |
| 030018 | | | <u>Racer, northern black</u> | Coluber constrictor constrictor |
| 030008 | | | <u>Racerunner, eastern six-lined</u> | Aspidoscelis sexlineata sexlineata |
| 030023 | | | <u>Ratsnake, eastern</u> | Pantherophis alleghaniensis |
| 030006 | | | <u>Skink, broad-headed</u> | Plestiodon laticeps |
| 030004 | | | <u>Skink, common five- lined</u> | Plestiodon fasciatus |
| 030007 | | | <u>Skink, little brown</u> | Scincella lateralis |
| 030005 | | | <u>Skink, southeastern five-lined</u> | Plestiodon inexpectatus |
| 030077 | | | <u>Slider, red-eared</u> | Trachemys scripta elegans |
| 030042 | | | <u>Snake, northern red- bellied</u> | Storeria occipitomaculata occipitomaculata |
| 030020 | | | <u>Snake, northern ring- necked</u> | Diadophis punctatus edwardsii |
| 030021 | | | <u>Snake, southern ring- necked</u> | Diadophis punctatus punctatus |
| 030052 | | | <u>Turtle, eastern musk</u> | Sternotherus odoratus |
| 030060 | | | <u>Turtle, eastern painted</u> | Chrysemys picta picta |
| 030051 | | | <u>Turtle, southeastern mud</u> | Kinosternon subrubrum subrubrum |
| 030076 | | | <u>Turtle, striped mud</u> | Kinosternon baurii |
| 030037 | | | <u>Watersnake, brown</u> | Nerodia taxispilota |
| 030034 | | | <u>Watersnake, northern</u> | Nerodia sipedon sipedon |
| 030036 | | | <u>Watersnake, plain- bellied</u> | Nerodia erythrogaster |
| 030019 | | | <u>Wormsnake, eastern</u> | Carphophis amoenus amoenus |
| 040038 | | | <u>Bittern, American</u> | Botaurus lentiginosus |
| 040346 | | | <u>Blackbird, red-winged</u> | Agelaius phoeniceus |
| 040282 | | | <u>Bluebird, eastern</u> | Sialia sialis |
| 040068 | | | <u>Bufflehead</u> | Bucephala albeola |
| 040361 | | | <u>Bunting, indigo</u> | Passerina cyanea |

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| 040362 | | | <u>Bunting, Lazuli</u> | Passerina amoena |
| 040363 | | | <u>Bunting, painted</u> | Passerina ciris ciris |
| 040401 | | | <u>Bunting, snow</u> | Plectrophenax nivalis nivalis |
| 040064 | | | <u>Canvasback</u> | Aythya valisineria |
| 040357 | | | <u>Cardinal, northern</u> | Cardinalis cardinalis |
| 040258 | | | <u>Chickadee, Carolina</u> | Poecile carolinensis |
| 040214 | | | <u>Chuck-will's-widow</u> | Antrostomus carolinensis |
| 040113 | | | <u>Coot, American</u> | Fulica americana |
| 040024 | | | <u>Cormorant, double-crested</u> | Phalacrocorax auritus |
| 040023 | | | <u>Cormorant, great</u> | Phalacrocorax carbo |
| 040353 | | | <u>Cowbird, brown-headed</u> | Molothrus ater |
| 040264 | | | <u>Creeper, brown</u> | Certhia americana |
| 040373 | | | <u>Crossbill, white-winged</u> | Loxia leucoptera |
| 040255 | | | <u>Crow, American</u> | Corvus brachyrhynchos |
| 040256 | | | <u>Crow, fish</u> | Corvus ossifragus |
| 040364 | | | <u>Dickcissel</u> | Spiza americana |
| 040198 | | | <u>Dove, mourning</u> | Zenaida macroura carolinensis |
| 040143 | | | <u>Dowitcher, long-billed</u> | Limnodromus scolopaceus |
| 040069 | | | <u>Duck, long-tailed</u> | Clangula hyemalis |
| 040076 | | | <u>Duck, ruddy</u> | Oxyura jamaicensis |
| 040061 | | | <u>Duck, wood</u> | Aix sponsa |
| 040093 | | | <u>Eagle, bald</u> | Haliaeetus leucocephalus |
| 040030 | | | <u>Egret, cattle</u> | Bubulcus ibis |
| 040032 | | | <u>Egret, great</u> | Ardea alba egretta |
| 040367 | | | <u>Finch, house</u> | Haemorhous mexicanus |
| 040366 | | | <u>Finch, purple</u> | Haemorhous purpureus |
| 040239 | | | <u>Flycatcher, Acadian</u> | Empidonax virescens |
| 040234 | | | <u>Flycatcher, great crested</u> | Myiarchus crinitus |
| 040053 | | | <u>Gadwall</u> | Anas strepera |
| 040284 | | | <u>Gnatcatcher, blue-gray</u> | Polioptila caerulea |

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| 040124 | | | <u>Godwit, Hudsonian</u> | Limosa haemastica |
| 040067 | | | <u>Goldeneye, common</u> | Bucephala clangula americana |
| 040371 | | | <u>Goldfinch, American</u> | Spinus tristis |
| 040045 | | | <u>Goose, Canada</u> | Branta canadensis |
| 040049 | | | <u>Goose, lesser snow</u> | Chen caerulescens caerulescens |
| 040410 | | | <u>Goose, snow</u> | Chen caerulescens |
| 040351 | | | <u>Grackle, boat-tailed</u> | Quiscalus major |
| 040352 | | | <u>Grackle, common</u> | Quiscalus quiscula |
| 040005 | | | <u>Grebe, horned</u> | Podiceps auritus |
| 040008 | | | <u>Grebe, pied-billed</u> | Podilymbus podiceps |
| 040004 | | | <u>Grebe, red-necked</u> | Podiceps grisegena |
| 040360 | | | <u>Grosbeak, blue</u> | Guiraca caerulea caerulea |
| 040365 | | | <u>Grosbeak, evening</u> | Coccothraustes vespertinus |
| 040358 | | | <u>Grosbeak, rose-breasted</u> | Pheucticus ludovicianus |
| 040165 | | | <u>Gull, great black-backed</u> | Larus marinus |
| 040167 | | | <u>Gull, herring</u> | Larus argentatus |
| 040170 | | | <u>Gull, ring-billed</u> | Larus delawarensis |
| 040089 | | | <u>Hawk, broad-winged</u> | Buteo platypterus |
| 040086 | | | <u>Hawk, Cooper's</u> | Accipiter cooperii |
| 040088 | | | <u>Hawk, red-shouldered</u> | Buteo lineatus lineatus |
| 040087 | | | <u>Hawk, red-tailed</u> | Buteo jamaicensis |
| 040090 | | | <u>Hawk, rough-legged</u> | Buteo lagopus johannis |
| 040085 | | | <u>Hawk, sharp-shinned</u> | Accipiter striatus velox |
| 040027 | | | <u>Heron, great blue</u> | Ardea herodias herodias |
| 040034 | | | <u>Heron, tricolored</u> | Egretta tricolor |
| 040218 | | | <u>Hummingbird, ruby-throated</u> | Archilochus colubris |
| 040219 | | | <u>Hummingbird, rufous</u> | Selasphorus rufus |
| 040041 | | | <u>Ibis, white</u> | Eudocimus albus |
| 040160 | | | <u>Jaeger, parasitic</u> | Stercorarius parasiticus |
| 040159 | | | <u>Jaeger, pomarine</u> | Stercorarius pomarinus |
| 040252 | | | <u>Jay, blue</u> | Cyanocitta cristata |

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| 040387 | | | <u>Junco, dark-eyed</u> | Junco hyemalis |
| 040098 | | | <u>Kestrel, American</u> | Falco sparverius sparverius |
| 040119 | | | <u>Killdeer</u> | Charadrius vociferus |
| 040285 | | | <u>Kinglet, golden-crowned</u> | Regulus satrapa |
| 040286 | | | <u>Kinglet, ruby-crowned</u> | Regulus calendula |
| 040177 | | | <u>Kittiwake, black-legged</u> | Rissa tridactyla |
| 040245 | | | <u>Lark, horned</u> | Eremophila alpestris |
| 040001 | | | <u>Loon, common</u> | Gavia immer |
| 040051 | | | <u>Mallard</u> | Anas platyrhynchos |
| 040251 | | | <u>Martin, purple</u> | Progne subis |
| 040078 | | | <u>Merganser, common</u> | Mergus merganser americanus |
| 040077 | | | <u>Merganser, hooded</u> | Lophodytes cucullatus |
| 040079 | | | <u>Merganser, red-breasted</u> | Mergus serrator serrator |
| 040097 | | | <u>Merlin</u> | Falco columbarius |
| 040271 | | | <u>Mockingbird, northern</u> | Mimus polyglottos |
| 040112 | | | <u>Moorhen, common</u> | Gallinula chloropus cachinnans |
| 040216 | | | <u>Nighthawk, common</u> | Chordeiles minor |
| 040263 | | | <u>Nuthatch, brown-headed</u> | Sitta pusilla |
| 040262 | | | <u>Nuthatch, red-breasted</u> | Sitta canadensis |
| 040261 | | | <u>Nuthatch, white-breasted</u> | Sitta carolinensis |
| 040348 | | | <u>Oriole, Baltimore</u> | Icterus galbula |
| 040347 | | | <u>Oriole, orchard</u> | Icterus spurius |
| 040095 | | | <u>Osprey</u> | Pandion haliaetus carolinensis |
| 040330 | | | <u>Ovenbird</u> | Seiurus aurocapilla |
| 040209 | | | <u>Owl, barred</u> | Strix varia |
| 040206 | | | <u>Owl, great horned</u> | Bubo virginianus |
| 040211 | | | <u>Owl, short-eared</u> | Asio flammeus |
| 040312 | | | <u>Parula, northern</u> | Setophaga americana |

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| 040020 | | | <u>Pelican, brown</u> | <i>Pelecanus occidentalis carolinensis</i> |
| 040136 | | | <u>Phalarope, Wilson's</u> | <i>Phalaropus tricolor</i> |
| 040101 | | | <u>Pheasant, ring-necked</u> | <i>Phasianus colchicus</i> |
| 040236 | | | <u>Phoebe, eastern</u> | <i>Sayornis phoebe</i> |
| 040197 | | | <u>Pigeon, rock</u> | <i>Columba livia</i> |
| 040287 | | | <u>Pipit, American</u> | <i>Anthus rubescens</i> |
| 040062 | | | <u>Redhead</u> | <i>Aythya americana</i> |
| 040341 | | | <u>Redstart, American</u> | <i>Setophaga ruticilla</i> |
| 040275 | | | <u>Robin, American</u> | <i>Turdus migratorius</i> |
| 040149 | | | <u>Sandpiper, least</u> | <i>Calidris minutilla</i> |
| 040134 | | | <u>Sandpiper, spotted</u> | <i>Actitis macularia</i> |
| 040129 | | | <u>Sandpiper, upland</u> | <i>Bartramia longicauda</i> |
| 040147 | | | <u>Sandpiper, western</u> | <i>Calidris mauri</i> |
| 040225 | | | <u>Sapsucker, yellow-bellied</u> | <i>Sphyrapicus varius</i> |
| 040066 | | | <u>Scaup, lesser</u> | <i>Aythya affinis</i> |
| 040075 | | | <u>Scoter, black</u> | <i>Melanitta nigra americana</i> |
| 040205 | | | <u>Screech-owl, eastern</u> | <i>Megascops asio</i> |
| 040060 | | | <u>Shoveler, northern</u> | <i>Anas clypeata</i> |
| 040370 | | | <u>Siskin, pine</u> | <i>Spinus pinus</i> |
| 040141 | | | <u>Snipe, Wilson's</u> | <i>Gallinago delicata</i> |
| 040108 | | | <u>Sora</u> | <i>Porzana carolina</i> |
| 040389 | | | <u>Sparrow, chipping</u> | <i>Spizella passerina</i> |
| 040390 | | | <u>Sparrow, clay-colored</u> | <i>Spizella pallida</i> |
| 040395 | | | <u>Sparrow, fox</u> | <i>Passerella iliaca</i> |
| 040342 | | | <u>Sparrow, house</u> | <i>Passer domesticus</i> |
| 040396 | | | <u>Sparrow, Lincoln's</u> | <i>Melospiza lincolnii</i> |
| 040377 | | | <u>Sparrow, savannah</u> | <i>Passerculus sandwichensis</i> |
| 040398 | | | <u>Sparrow, song</u> | <i>Melospiza melodia</i> |
| 040397 | | | <u>Sparrow, swamp</u> | <i>Melospiza georgiana</i> |
| 040383 | | | <u>Sparrow, vesper</u> | <i>Pooecetes gramineus</i> |
| 040394 | | | <u>Sparrow, white-throated</u> | <i>Zonotrichia albicollis</i> |
| 040294 | | | <u>Starling, European</u> | <i>Sturnus vulgaris</i> |
| 040039 | | | <u>Stork, wood</u> | <i>Mycteria americana</i> |

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| 040249 | | | <u>Swallow, barn</u> | Hirundo rustica |
| 040246 | | | <u>Swallow, tree</u> | Tachycineta bicolor |
| 040044 | | | <u>Swan, tundra</u> | Cygnus columbianus columbianus |
| 040355 | | | <u>Tanager, scarlet</u> | Piranga olivacea |
| 040356 | | | <u>Tanager, summer</u> | Piranga rubra |
| 040354 | | | <u>Tanager, western</u> | Piranga ludoviciana |
| 040057 | | | <u>Teal, blue-winged</u> | Anas discors orphna |
| 040056 | | | <u>Teal, green-winged</u> | Anas crecca carolinensis |
| 040189 | | | <u>Tern, Caspian</u> | Sterna caspia |
| 040278 | | | <u>Thrush, hermit</u> | Catharus guttatus |
| 040260 | | | <u>Titmouse, tufted</u> | Baeolophus bicolor |
| 040374 | | | <u>Towhee, green-tailed</u> | Pipilo chlorurus |
| 040102 | | | <u>Turkey, wild</u> | Meleagris gallopavo silvestris |
| 040135 | | | <u>Turnstone, ruddy</u> | Arenaria interpres morinella |
| 040281 | | | <u>Veery</u> | Catharus fuscescens |
| 040298 | | | <u>Vireo, blue-headed</u> | Vireo solitarius |
| 040299 | | | <u>Vireo, red-eyed</u> | Vireo olivaceus |
| 040295 | | | <u>Vireo, white-eyed</u> | Vireo griseus |
| 040297 | | | <u>Vireo, yellow-throated</u> | Vireo flavifrons |
| 040081 | | | <u>Vulture, black</u> | Coragyps atratus |
| 040080 | | | <u>Vulture, turkey</u> | Cathartes aura |
| 040316 | | | <u>Warbler, black-throated blue</u> | Setophaga caerulescens |
| 040318 | | | <u>Warbler, black-throated gray</u> | Setophaga nigrescens |
| 040319 | | | <u>Warbler, black-throated green</u> | Setophaga virens |
| 040325 | | | <u>Warbler, blackpoll</u> | Setophaga striata |
| 040307 | | | <u>Warbler, blue-winged</u> | Vermivora cyanoptera |
| 040323 | | | <u>Warbler, chestnut-sided</u> | Setophaga pensylvanica |
| 040334 | | | <u>Warbler, Connecticut</u> | Oporornis agilis |
| 040338 | | | <u>Warbler, hooded</u> | Setophaga citrina |
| 040314 | | | <u>Warbler, magnolia</u> | Setophaga magnolia |

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| 040311 | | | <u>Warbler, Nashville</u> | Oreothlypis ruficapilla |
| 040329 | | | <u>Warbler, palm</u> | Setophaga palmarum |
| 040326 | | | <u>Warbler, pine</u> | Setophaga pinus |
| 040328 | | | <u>Warbler, prairie</u> | Setophaga discolor |
| 040303 | | | <u>Warbler, prothonotary</u> | Protonotaria citrea |
| 040305 | | | <u>Warbler, worm-eating</u> | Helmitheros vermivorus |
| 040313 | | | <u>Warbler, yellow</u> | Setophaga petechia |
| 040317 | | | <u>Warbler, yellow-rumped</u> | Setophaga coronata |
| 040322 | | | <u>Warbler, yellow-throated</u> | Setophaga dominica |
| 040332 | | | <u>Waterthrush, Louisiana</u> | Parkesia motacilla |
| 040331 | | | <u>Waterthrush, northern</u> | Parkesia noveboracensis |
| 040290 | | | <u>Waxwing, cedar</u> | Bombycilla cedrorum |
| 040059 | | | <u>Wigeon, American</u> | Anas americana |
| 040058 | | | <u>Wigeon, Eurasian</u> | Anas penelope |
| 040227 | | | <u>Woodpecker, downy</u> | Picoides pubescens medianus |
| 040226 | | | <u>Woodpecker, hairy</u> | Picoides villosus |
| 040222 | | | <u>Woodpecker, pileated</u> | Dryocopus pileatus |
| 040223 | | | <u>Woodpecker, red-bellied</u> | Melanerpes carolinus |
| 040224 | | | <u>Woodpecker, red-headed</u> | Melanerpes erythrocephalus |
| 040268 | | | <u>Wren, Carolina</u> | Thryothorus ludovicianus |
| 040265 | | | <u>Wren, house</u> | Troglodytes aedon |
| 040270 | | | <u>Wren, sedge</u> | Cistothorus platensis |
| 040266 | | | <u>Wren, winter</u> | Troglodytes troglodytes |
| 040336 | | | <u>Yellowthroat, common</u> | Geothlypis trichas |
| 050028 | | | <u>Bat, big brown</u> | Eptesicus fuscus fuscus |
| 050133 | | | <u>Bat, Brazilian free-tailed</u> | Tadarida brasiliensis cynocephala |
| 050033 | | | <u>Bat, evening</u> | Nycticeius humeralis humeralis |
| 050031 | | | <u>Bat, seminole</u> | Lasiurus seminolus |
| 050069 | | | <u>Beaver, American</u> | Castor canadensis |

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| 050051 | | | <u>Bobcat</u> | Lynx rufus rufus |
| 050055 | | | <u>Chipmunk, Fisher's eastern</u> | Tamias striatus fisheri |
| 050103 | | | <u>Cottontail, eastern</u> | Sylvilagus floridanus mallurus |
| 050125 | | | <u>Coyote</u> | Canis latrans |
| 050108 | | | <u>Deer, white-tailed</u> | Odocoileus virginianus |
| 050050 | | | <u>Fox, common gray</u> | Urocyon cinereoargenteus cinereoargenteus |
| 050049 | | | <u>Fox, red</u> | Vulpes vulpes fulva |
| 050086 | | | <u>Lemming, southern bog</u> | Synaptomys cooperi helaletes |
| 050042 | | | <u>Mink, common</u> | Neovison vison mink |
| 050017 | | | <u>Mole, eastern</u> | Scalopus aquaticus aquaticus |
| 050110 | | | <u>Mole, star-nosed</u> | Condylura cristata parva |
| 050074 | | | <u>Mouse, common white-footed</u> | Peromyscus leucopus leucopus |
| 050070 | | | <u>Mouse, eastern harvest</u> | Reithrodontomys humulis humulis |
| 050071 | | | <u>Mouse, eastern harvest</u> | Reithrodontomys humulis virginianus |
| 050098 | | | <u>Mouse, house</u> | Mus musculus musculus |
| 050076 | | | <u>Mouse, Lewis' golden</u> | Ochrotomys nuttalli nuttalli |
| 050099 | | | <u>Mouse, meadow jumping</u> | Zapus hudsonius americanus |
| 050092 | | | <u>Muskrat, common</u> | Ondatra zibethicus zibethicus |
| 050093 | | | <u>Muskrat, large-toothed</u> | Ondatra zibethicus macrodon |
| 050001 | | | <u>Opossum, Virginia</u> | Didelphis virginiana virginiana |
| 050045 | | | <u>Otter, northern river</u> | Lontra canadensis lataxina |
| 050038 | | | <u>Raccoon</u> | Procyon lotor lotor |
| 050078 | | | <u>Rat, marsh rice</u> | Oryzomys palustris palustris |
| 050095 | | | <u>Rat, Norway</u> | Rattus norvegicus norvegicus |

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| 050008 | | | <u>Shrew, Dismal Swamp southeastern</u> | Sorex longirostris fisheri |
| 050013 | | | <u>Shrew, Kirtland's short-tailed</u> | Blarina brevicauda kirtlandi |
| 050015 | | | <u>Shrew, least</u> | Cryptotis parva parva |
| 050012 | | | <u>Shrew, northern short-tailed</u> | Blarina brevicauda churchi |
| 050010 | | | <u>Shrew, pygmy</u> | Sorex hoyi winnemana |
| 050007 | | | <u>Shrew, southeastern</u> | Sorex longirostris longirostris |
| 050011 | | | <u>Shrew, southern short-tailed</u> | Blarina carolinensis carolinensis |
| 050047 | | | <u>Skunk, striped</u> | Mephitis mephitis nigra |
| 050048 | | | <u>Skunk, striped</u> | Mephitis mephitis mephitis |
| 050057 | | | <u>Squirrel, eastern gray</u> | Sciurus carolinensis carolinensis |
| 050065 | | | <u>Squirrel, southern flying</u> | Glaucomys volans volans |
| 050090 | | | <u>Vole, common pine</u> | Microtus pinetorum pinetorum |
| 050083 | | | <u>Vole, dark meadow</u> | Microtus pennsylvanicus nigrans |
| 050082 | | | <u>Vole, meadow</u> | Microtus pennsylvanicus pennsylvanicus |
| 050091 | | | <u>Vole, pine</u> | Microtus pinetorum scalopsoides |
| 050041 | | | <u>Weasel, long-tailed</u> | Mustela frenata noveboracensis |
| 050054 | | | <u>Woodchuck</u> | Marmota monax monax |
| 060177 | | | <u>Clam, Asian</u> | Corbicula fluminea |
| 060127 | | | <u>Clam, Atlantic rangia</u> | Rangia cuneata |
| 060012 | | | <u>Floater, eastern</u> | Pyganodon cataracta |
| 060156 | | | <u>Floater, Giant</u> | Pyganodon grandis |
| 060025 | | | <u>Mussel, eastern elliptio</u> | Elliptio complanata |
| 060013 | | | <u>Mussel, paper pondshell</u> | Utterbackia imbecillis |
| 060095 | | | <u>Snail, European physa</u> | Physella acuta |

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| 070073 | | | <u>Crab, flatback mud</u> | Eurypanopeus depressus |
| 070099 | | | <u>Crayfish</u> | Fallicambarus uhleri |
| 070095 | | | <u>Crayfish, devil</u> | Cambarus diogenes diogenes |
| 070126 | | | <u>Crayfish, Digger</u> | Fallicambarus fodiens |
| 070094 | | | <u>Crayfish, no common name</u> | Cambarus acuminatus |
| 070098 | | | <u>Crayfish, spiny cheek</u> | Orconectes limosus |
| 070120 | | | <u>Crayfish, White River</u> | Procambarus acutus |
| 070070 | | | <u>SHRIMP, EELGRASS</u> | HIPPOLYTE PLEURACENTHA |
| 100043 | | | <u>Armyworm</u> | Pseudaletia unipuncta |
| 100041 | | | <u>Borer, European corn</u> | Ostrinia nubilatis |
| 100262 | | | <u>Butterfly, American lady</u> | Vanessa virginiensis |
| 100092 | | | <u>Butterfly, black swallowtail</u> | Papilio polyxenes asterius |
| 100196 | | | <u>Butterfly, Brazilian skipper</u> | Calpododes ethlius |
| 100179 | | | <u>Butterfly, broad-winged skipper</u> | Poanes viator |
| 100205 | | | <u>Butterfly, cabbage white</u> | Pieris rapae |
| 100167 | | | <u>Butterfly, carus skipper</u> | Polites carus |
| 100159 | | | <u>Butterfly, clouded skipper</u> | Lerema accius |
| 100094 | | | <u>Butterfly, clouded sulphur</u> | Colias philodice |
| 100265 | | | <u>Butterfly, common buckeye</u> | Junonia coenia |
| 100238 | | | <u>Butterfly, eastern tailed-blue</u> | Everes comyntas |
| 100093 | | | <u>Butterfly, eastern tiger swallowtail</u> | Papilio glaucus |
| 100145 | | | <u>Butterfly, Hayhurst's scalloping</u> | Staphylus hayhurstii |
| 100149 | | | <u>Butterfly, Horace's duskywing</u> | Erynnis horatius |

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| 100148 | | <u>Butterfly, Juvenal's duskywing</u> | Erynnis juvenalis |
| 100160 | | <u>Butterfly, least skipper</u> | Ancyloxypha numitor |
| 100140 | | <u>Butterfly, long-tailed skipper</u> | Urbanus proteus |
| 100211 | | <u>Butterfly, orange sulphur</u> | Colias eurytheme |
| 100214 | | <u>Butterfly, orange-barred sulphur</u> | Phoebis philea |
| 100359 | | <u>Butterfly, Peck's skipper</u> | Polites peckius |
| 100259 | | <u>Butterfly, question mark</u> | Polygonia interrogationis |
| 100268 | | <u>Butterfly, red-spotted purple</u> | Limenitis arthemis astyanax |
| 100198 | | <u>Butterfly, salt marsh skipper</u> | Panoquina panoquin |
| 100082 | | <u>Butterfly, silver-spotted skipper</u> | Epargyreus clarus |
| 100146 | | <u>Butterfly, sleepy duskywing</u> | Erynnis brizo |
| 100142 | | <u>Butterfly, southern cloudywing</u> | Thorybes bathyllus |
| 100202 | | <u>Butterfly, spicebush swallowtail</u> | Papilio troilus |
| 100239 | | <u>Butterfly, spring azure</u> | Celastrina ladon |
| 100269 | | <u>Butterfly, tawny emperor</u> | Asterocampa clyton |
| 100247 | | <u>Butterfly, variegated fritillary</u> | Euptoieta claudia |
| 100266 | | <u>Butterfly, viceroy</u> | Limenitis archippus |
| 100180 | | <u>Butterfly, Zabulon skipper</u> | Poanes zabulon |
| 100151 | | <u>Butterfly, Zarucco duskywing</u> | Erynnis zarucco |
| 100042 | | <u>Earworm, corn</u> | Heliathis zea |
| 100100 | | <u>Moth, catalpa sphinx</u> | Ceratonia catalpae |
| 100040 | | <u>Moth, codling</u> | Cydia pomonella |
| 100047 | | <u>Moth, gypsy</u> | Lymantria dispar |

| | | | | |
|--------|--|--|---------------------------|--------------------------------|
| 110230 | | | <u>Tick, American dog</u> | Dermacentor variabilis |
| 110232 | | | <u>Tick, brown dog</u> | Rhipicephalus sanguineus |
| 110228 | | | <u>Tick, lone star</u> | Amblyomma americanum |
| 110231 | | | <u>Tick, rabbit</u> | Haemaphysalis leporispalustris |
| 110229 | | | <u>Tick, winter</u> | Dermacentor albipictus |

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.; b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.; c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Federal Legal Status: Select All

State Legal Status: Select All

County: Newport News (City)

Search Run: 5/5/2017 13:38:57 PM

Result Summary

Total Species returned: 1

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

| Common Name/Natural Community | Scientific Name | Global Conservation Status Rank | State Conservation Status Rank | Federal Legal Status | State Legal Status | Statewide Occurrences | Virginia Coastal Zone |
|-------------------------------|---------------------------|---|--|--------------------------------------|------------------------------------|-----------------------|-----------------------|
| Newport News (City) | | | | | | | |
| FISH | | | | | | | |
| Atlantic | Acipenser | G3 | S2 | LE | LE | 2 | Y |

| | | | | | | | |
|--|---|---|--|--------------------------------------|------------------------------------|-----------------------|-----------------------|
| Common Name/Natural Community Sturgeon | Scientific Name oxyrinchus | Global Conservation Status Rank | State Conservation Status Rank | Federal Legal Status | State Legal Status | Statewide Occurrences | Virginia Coastal Zone |
|--|---|---|--|--------------------------------------|------------------------------------|-----------------------|-----------------------|

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an [information request](#).

To Contribute information on locations of natural heritage resources, please fill out and submit a [rare species sighting form](#).

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APPENDIX E

WETLAND MITIGATION PLAN FOR MANAGEMENT OF VEGETATION AIRFIELD CLEARANCES AT FELKER ARMY AIRFIELD

DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT EUSTIS,
VIRGINIA



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**WETLAND MITIGATION PLAN
FOR MANAGEMENT OF VEGETATION
AIRFIELD CLEARANCES AT FELKER
ARMY AIRFIELD**

**DEPARTMENT OF THE AIR FORCE
633RD AIR BASE WING
JOINT BASE LANGLEY EUSTIS-FORT
EUSTIS, VIRGINIA**



DECEMBER 1, 2017

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

Vegetation composition and heights have not been maintained in accordance with the *Unified Facilities Criteria Airfield and Heliport Planning Design* (UFC) 3-260-01 at the Felker Army Airfield that is located at the Joint Base Langley Eustis-Fort Eustis (JBLE-Eustis). The *purpose* of the Proposed Action is to attain and maintain vegetation clearances within the Primary Surface, the Clear Zone, and the Approach-Departure Surface Area adjacent to the Clear Zone (for a definition of the surfaces and Clear Zone please refer to Section 3.0, *Description of Vegetation Airfield Clearance Requirements*) at the Felker Army Airfield, JBLE-Eustis that provide the adequate margins of safety for aircraft take-offs and landings in accordance with the UFC 3-260-01 to the maximum, practical extent.

The *need* to attain and maintain vegetation clearances at the Felker Army Airfield was cited in the triennial Quality Assurance Evaluation by the Installation Management Command and the United States Army Aeronautical Service Agency inspection teams on May 30, 2014.

Implementation of the Proposed Action would result in meeting the UFC 3-260-01 vegetation clearance requirements within the Primary Surface and Clear Zone (except in emergent wetlands) and the Approach-Departure Surface Area adjacent to the Clear Zone to the maximum, practical extent and maintaining vegetation clearances over time.

2.0 WETLAND MITIGATION REGULATORY BACKGROUND

The U.S. Army Corps of Engineers (USACE) reviews applications for Department of the Army (DA) permits under Section 404 of the Clean Water Act. With the exception of projects that are specifically designed to restore or enhance aquatic resources, most activities authorized by DA permits result in adverse impacts to waters of the United States. Compensatory mitigation is necessary to offset these unavoidable impacts to aquatic resource functions and services and to meet the programmatic goal of “no overall net loss” of aquatic resource functions and services.

On April 10, 2008, the USACE and U.S. Environmental Protection Agency published regulations entitled, “Compensatory Mitigation for Losses of Aquatic Resources” (Mitigation Rule). One of the primary goals of these regulations (33 Code of Federal Regulation (CFR) Parts 325 and 332) was to improve the quality and success of compensatory mitigation plans that are designed to offset impacts to aquatic resources authorized by DA permits. The Mitigation Rule emphasizes the strategic selection of mitigation sites on a watershed basis and established equivalent standards for all types of compensatory mitigation (mitigation banks, in-lieu fee programs, and permittee-responsible mitigation plans). Per these regulations, compensatory mitigation means the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of wetlands for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved. The three mechanisms for providing compensatory mitigation listed in order of

preference as stated in the Mitigation Rule are the following: mitigation banks, in-lieu fee programs, and permittee-responsible mitigation.

The Commonwealth of Virginia Water Protection permit regulations define mitigation as “sequentially avoiding and minimizing impacts to the extent practicable, and then compensating for remaining unavoidable impacts of a proposed action” (9 Virginia Administrative Code (VAC) 25-210-10). The VAC states that compensation must be sufficient to achieve no net loss of existing wetlands acreage and functions. (§ 62.1-44.15:21 B, Code of Virginia).

In 1972, the U.S. Congress enacted the Coastal Zone Management Act (CZMA) (16 U.S. Code (USC) 1451-1464) to assist the coastal states, Great Lake states, and the U.S. territories to develop coastal management programs, and comprehensively manage and balance competing uses of and impacts to coastal resources. The Virginia Coastal Zone Management Program was established via an Executive Order in 1986 and consists of a network of state agencies and local governments that administer enforceable laws, regulations, and policies that protect coastal resources and ensures sustainable development. Any federal action that has the potential to impact Virginia’s coastal resources is reviewed for consistency with the CZMA.

The Chesapeake Bay Preservation Act (CBPA) is one of the enforceable policies of the CZMA. The JBLE-Eustis follows, to the maximum extent practicable, the City of Newport News Chesapeake Bay Preservation Ordinance (CBPO), which was enacted pursuant to the CBPA, Sections 10.1-2100, et seq., of the VAC. Article V, Section 37.1-46 of the City of Newport News Code defines Chesapeake Bay Preservation Areas to include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). The RPA includes tidal waters and wetlands, perennial streams, contiguous wetlands, plus a 100-foot buffer to these “core” components. The RMA includes all lands within 100 feet landward of the landward boundary of the RPA, plus all lands containing slopes greater than 15 percent, highly erodible soils, and the 100-year floodplain. In accordance with the CPBO, the development of RPAs is restricted to water dependent activities, maintenance of public activities, passive recreation, water wells, and historic preservation. Removal of trees within the RPA is also strongly discouraged; as a result, the JBLE-Eustis retains the RPA and RMA to the extent practical.

3.0 DESCRIPTION OF VEGETATION AIRFIELD CLEARANCE REQUIREMENTS

The Felker runway is considered a Class A, IFR runway; Class A runways are mainly intended to accommodate small, light aircraft and are not intended for use by high-performance and large, heavy aircraft. The UFC 3-260–01 published in 17 November 2008 provides design standards used for Class A, IFR runways that includes vegetation clearance requirements intended to provide the proper margin of safety needed for aircraft take-offs and landings.

This section provides a description of terms used in the UFC 3-260-01 as they pertain to a Class A, IFR runway and also details the vegetation clearance requirements described in the criteria for the Primary Surface the Clear Zone, and the Approach-Departure Surface Area.

Primary Surface. The area that extends 200 feet in length from the ends of the runway and 500 feet in width from the centerline of the runway (Figure 3-1; Figure 3-2). Per the UFC 3-260-01, no trees or shrubs are allowed within the Primary Surface.

Overrun. The first 200 feet from each runway end, and the width of the runway, plus shoulders that is located within the Primary Surface. Per the UFC 3-260-01, no trees or shrubs are allowed within the Overrun (Figure 3-1; Figure 3-2).

Clear Zone. The area that starts at each runway end, and extends outward, 3,000 feet in length, and 1,000 feet in width (Figure 3-1; Figure 3-2). The Clear Zone overlaps 200 feet of the Primary Surface/Overrun that extends 200 feet beyond the runway ends.

We describe vegetation maintenance requirements within six distinct geographic portions of the Clear Zone: Clear Zone 1, Clear Zone 2, and Clear Zone 3 (Figure 3-1). Clear Zone 1 is described as the initial 1,000 feet of the Clear Zone extending in length from the ends of the runway, Clear Zone 2 is described as the next 1,000 feet of the Clear Zone, and Clear Zone 3 is described as the furthest 1,000 feet of the Clear Zone extending from the runway ends. Per the UFC 3-260-01, no trees or shrubs are allowed within the Clear Zone 1.

Approach-Departure Clearance Surface. The Approach-Departure Clearance Surface is an imaginary surface (surface that cannot be seen) that extends from the Runway Overrun into the air at a 40 horizontal: one vertical slope (Figure 3-1; Figure 3-2). Trees penetrating the Approach-Departure Clearance Surface within the Clear Zone 2 and Clear Zone 3 are required to be topped (cut to the required height per the UFC 3-260-01) to a height of 10 feet below the Approach-Departure Clearance Surface.



Figure 3-1. Airfield Surfaces and the Clear Zone at the Felker Army Airfield

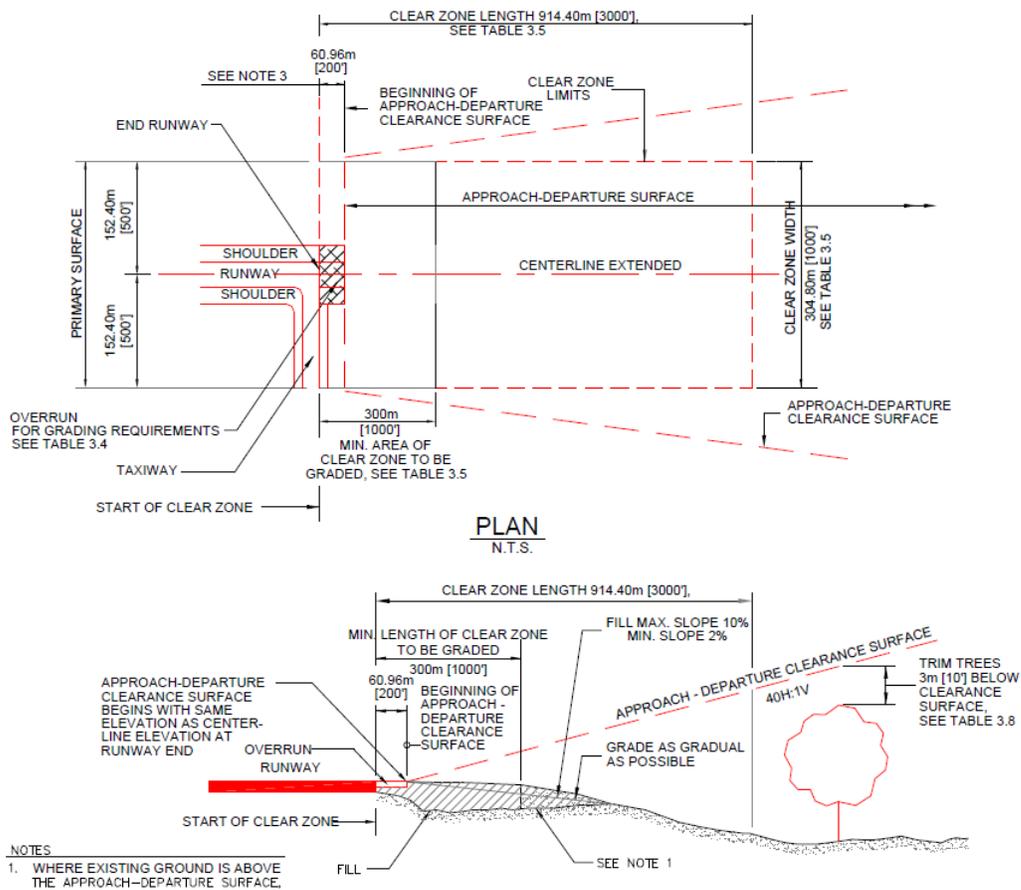


Figure 3-2. Location of the Primary Surface, the Clear Zone, and the Approach-Departure Clearance Surface for a Class A, IFR Runway

4.0 DESCRIPTION OF THE PROJECT ALTERNATIVES

4.1 Alternative 1

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Cutting to Stumps in Clear Zones 2 and Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01 except in emergent wetlands (Figure 4-1). Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees would be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing would be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal

sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) following the final soil grading. Soil testing would be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped (cut down to the required height) in accordance with the UFC 3-260-01. Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

Trees within Clear Zone 2 and Clear Zone 3 would be cut down to stumps as close to the ground surface as possible, leaving stumps eight inches or less in height (Figure 4-1). While the UFC 3-260-01 only requires tree topping in Clear Zone 2 and Clear Zone 3 to heights 10 feet below the Approach–Departure Clearance Surface, the additional cutting of the trees to stumps in Clear Zone 2 and Clear Zone 3 would further reduce potential tree-aircraft strike hazards.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Tree removal, cutting, and topping operations would be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down, or topped would be either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation would be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface would be maintained as herbaceous vegetation, not to exceed eight inches in height (except in emergent wetlands). Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights would be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation would continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

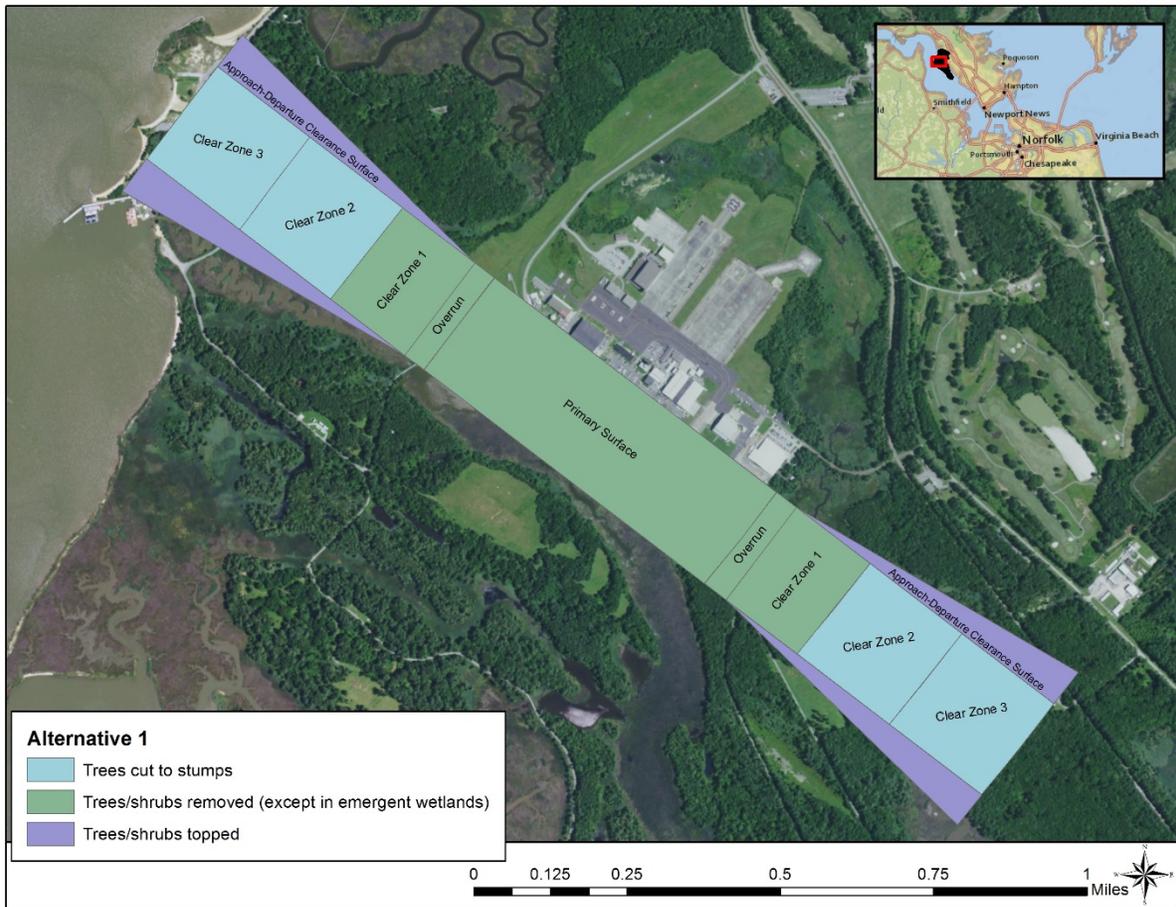


Figure 4-1. Alternative 1 tree and shrub removal, cutting, and topping areas in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area (Please note that trees will be cut to stumps in Emergent Wetlands in the Primary Surface and Clear Zone 1.)

4.2 Alternative 2

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Cutting to Stumps in Clear Zone 2 and Tree Topping in Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01 except in emergent wetlands (Figure 4-2). Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of the Primary Surface and Clear Zone 1, trees would be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing would be done to cut down shrubs and herbaceous vegetation in all areas of the Primary

Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) following the final soil grading. Soil testing would be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01 (Figure 4-2). Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

Trees within Clear Zone 2 would be cut down to stumps as close to the ground surface as possible, leaving tree stumps no higher than eight inches (Figure 4-2). While the UFC 3-260-01 only requires tree topping in Clear Zone 2 to heights 10 feet below the Approach–Departure Clearance Surface, the additional cutting of the trees to stumps would further reduce potential-tree aircraft strike hazards.

In Clear Zone 3, trees would be topped in accordance with the UFC 3-260-01 (Figure 4-2). Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Tree removal, cutting, and topping operations would be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to prevent and mitigate any potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down, or topped would be either be sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation would be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface would be maintained as herbaceous vegetation, not to exceed eight inches in height (except in emergent wetlands). Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-year recurring frequency interval, tree heights would be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest

management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation would continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

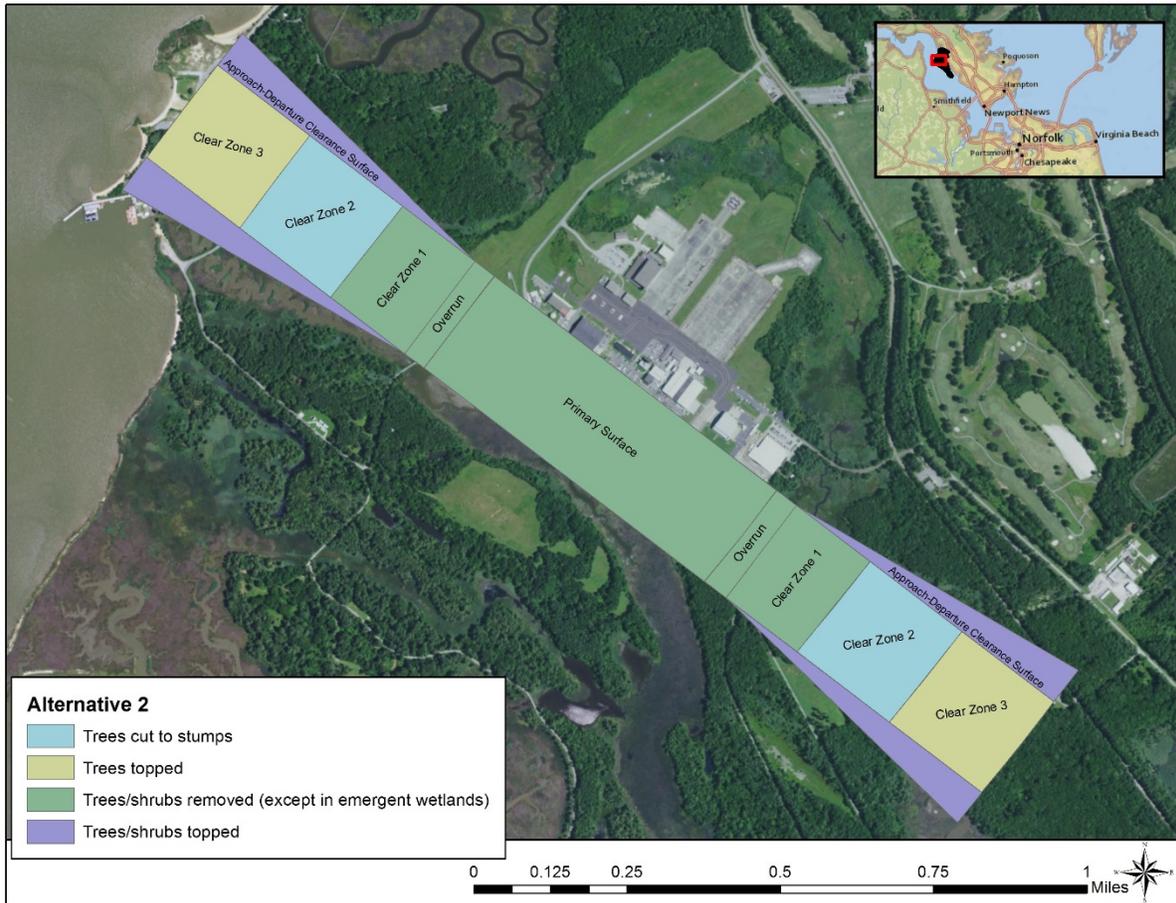


Figure 4-2. Alternative 2 tree and shrub removal, cutting, and topping areas in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area (Please note that trees will be cut to stumps in Emergent Wetlands in the Primary Surface and Clear Zone 1.)

4.3 Alternative 3 (Preferred Alternative)

Tree Cutting and Removal and Mowing in the Primary Surface and Clear Zone 1 and Tree Topping in Clear Zone 2 and Clear Zone 3

Within the Primary Surface and Clear Zone 1, trees would be removed in accordance with the UFC 3-260-01, except in emergent wetlands (Figure 4-3). Within emergent wetlands in the Primary Surface and Clear Zone 1, trees would be cut to stumps eight inches or less. In all other areas of

the Primary Surface and Clear Zone 1, trees would be removed and tree stumps and root systems would be individually ground down and hand cut to minimize any potential disturbances to wetlands, upland habitat, and cultural resources. Minimal filling and grading of soils would be restricted to the tree removal sites where stump grinding would occur. Brush mowing and forestry mowing would be done to cut down shrubs and herbaceous vegetation in all areas of the Primary Surface and Clear Zone 1 to a height of eight inches or less, except in emergent wetlands. Following tree removal and the minor soil grading that would be restricted to the tree removal sites, a native, herbaceous, perennial seed mix would be spread at the Primary Surface and Clear Zone 1 (except in emergent wetlands) within seven days of the final soil grading. Soil testing would be done to determine if fertilizer application is needed prior to the seeding and to determine the appropriate fertilizer constituents.

Trees that penetrate the Approach–Departure Clearance Surface adjacent to the Clear Zone would be topped in accordance with the UFC 3-260-01 (Figure 4-3). Trees would be topped to a height of 10 feet below the Approach-Departure Clearance Surface.

In Clear Zone 2, trees would be topped in accordance with the UFC 3-260-01 (Figure 4-3). Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 18 feet to 43 feet in the Clear Zone 2. In Clear Zone 3, trees would also be topped in accordance with the UFC 3-260-01 (Figure 4-3). Trees would be topped if they penetrate 10 feet below the Approach-Departure Clearance Surface. This height ranges from 43 feet to 68 feet in the Clear Zone 3.

Tree removal, cutting, and topping operations would not occur from April 15-September 15 in order to protect any potential northern long-eared bat and Indiana bat roosting and pupping habitats.

Vegetation management operations within the Primary Surface and the clear zones would be controlled in accordance with forestry and stormwater BMPs to reduce potential disturbances to soils, natural resources, and cultural resources. Stormwater BMPs would be used to prevent and mitigate potential erosion and sedimentation impacts. Although this is not a forestry action, forestry BMPs will be followed where practical to reduce potential environmental impacts. Trees removed, cut down or topped would either sold as timber or disposed of offsite. Trees identified for removal will be offered for sale first to compensate the government for forestry products value. Shrubs and herbaceous vegetation would be disposed of offsite.

Long-term maintenance of the vegetation would be necessary to ensure vegetation is managed in accordance with the UFC 3-260-01 over time. The Clear Zone 1 and the Primary Surface would be maintained as herbaceous vegetation, not to exceed eight inches in height, except in emergent wetlands. Brush mowing and forestry mowing in the Primary Surface and Clear Zone 1 would be done to maintain vegetation heights eight inches or less (except in emergent wetlands) and would occur on an approximate biweekly basis during the growing season. Over an approximate five-

year recurring frequency interval, tree heights would be assessed via a LIDAR analysis (or a comparable methodology) to identify maintenance needs and to conduct the necessary vegetation maintenance. In addition, tree stumps would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Topped trees would be treated in accordance with integrated pest management practices at an approximate five-year frequency interval to prevent tree re-growth over time. Vegetation would continue to be mowed in the grassy areas adjacent to the Landing Zone (runway, taxiway, and aircraft operational surfaces) in accordance with the UFC 3-260-01.

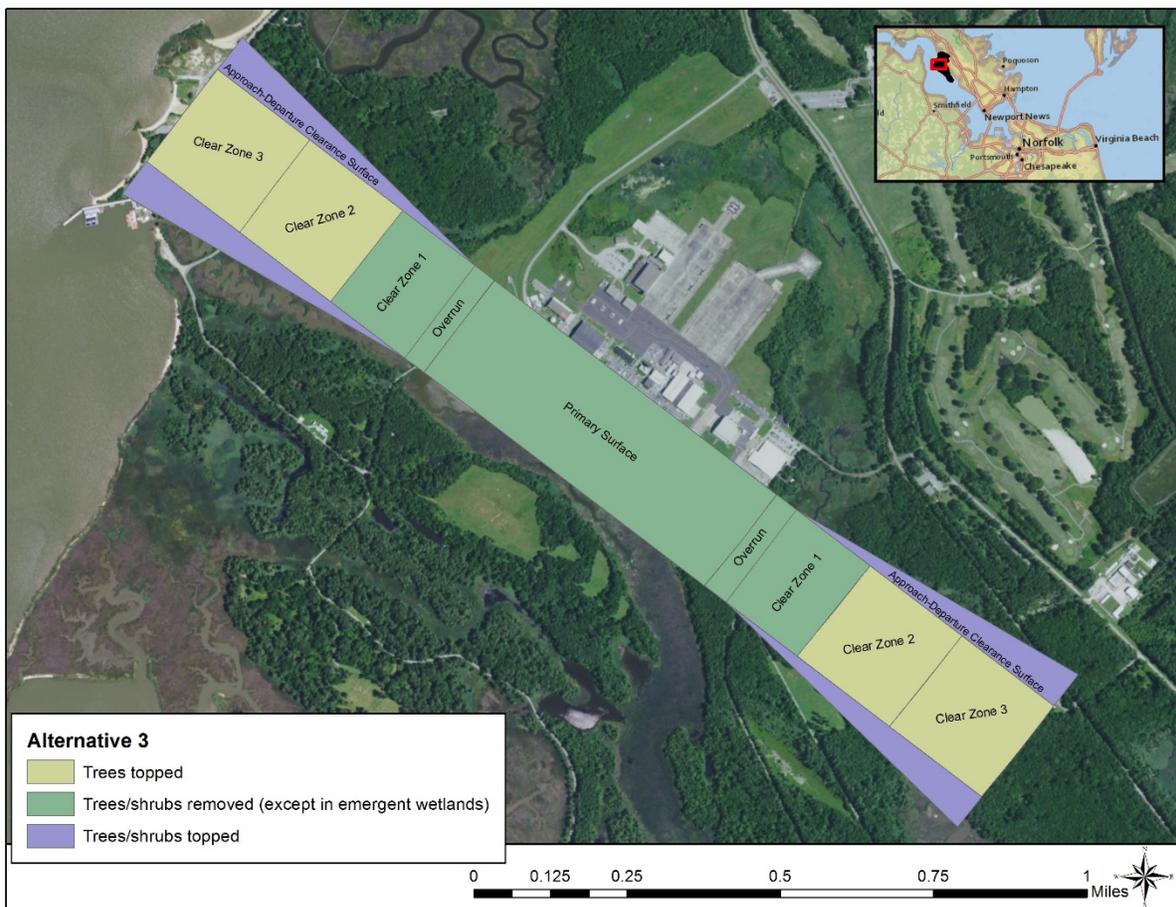


Figure 4-3. Alternative 3 Tree removal and topping areas in the Primary Surface, Clear Zone, and Approach-Departure Surface Area (Please note that trees will be cut to stumps in Emergent Wetlands in the Primary Surface and Clear Zone 1.)

4.4 Alternative 4

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and the Felker Army Airfield would continue to have hazardous vegetation that is not managed in accordance

with the UFC 3-260-01. Under the No Action Alternative, the safety conditions would degrade further over time, as more trees continue to grow in height and expand upon their current footprint in the ROI. Grassy areas would continue to be managed in the areas adjacent to the Landing Zone in accordance with the UFC 3-260-01. Eventual closure of operations, starting with instrument approaches, and eventually cessation of fixed wing operations, could occur if a vegetation maintenance program is not implemented or a UFC 3-260-01 waiver for all applicable areas is not obtained.

4.5 Alternative 5

Shortening the Runway

Under this alternative, no trees or shrubs would be impacted and the runway length would be shortened by 1,000 feet to reduce vegetation clearance issues within the modified Clear Zone 1. Each end of the runway would be reduced by 1,000 feet and this would render the runway unsuitable for fixed wing aircraft. This option would severely impact the continued flight operations that currently occur at the Felker Army Airfield. In addition, the trees flanking the runway in the Primary Surface and also the trees within the modified Clear Zone 2 and Clear Zone 3 would not be managed in accordance with the UFC 3-260-01.

4.6 Alternative 6

Relocation of the Airfield Operations

Under this alternative, the Felker Army Airfield operations would be relocated either onsite at another location at the JBLE–Eustis or to the nearest available Army/U.S. Air Force (USAF) runway located at Langley Air Force Base (AFB).

5.0 SCREENING OF ALTERNATIVES, ALTERNATIVE CONSIDERED BUT ELIMINATED, AND SELECTION OF THE PREFERRED ALTERNATIVE

A basic principle of the NEPA during the planning of a federal project is to develop and evaluate reasonable project alternatives, including the No Action Alternative. Evaluating reasonable alternatives is a crucial part of the NEPA process and provides necessary information and analyses that assist the decision-maker in selecting a Preferred Alternative. In evaluating alternatives, alternatives should meet the purpose and need of the project. Alternatives must also not significantly impact the current and future missions supported by the airfield. Alternatives must also avoid and minimize negative impacts to natural and cultural resources, to the extent practicable, with unavoidable impacts mitigated to the fullest extent practicable.

An initial screening of project alternatives was done to determine how various project alternatives would impact flight-based training missions supported by the airfield that was then followed by a more detailed screening of alternatives. During the initial screening, Alternatives 5 and 6 were

eliminated from further consideration as they would both cause substantive, negative impacts to flight missions currently supported by the airfield. Alternative 5, Shortening the Runway, was considered but eliminated as it would render the runway unsuitable for fixed wing aircraft.

Alternative 6, Relocation of the Airfield Operations, was an alternative that was considered but eliminated as it was determined that implementation of the alternative would substantively impact flight mission requirements for the following reasons:

- The JBLE-Eustis has no sufficient space for an airfield and airspace to occupy;
- Langley AFB has no existing facilities to support the tenant missions;
- The unique and classified nature of the RDT&E missions of the JBLE-Eustis tenants would require facilities and operations that would impede Langley AFB tenant missions, and vice versa; and
- The U.S. Navy mission supported at the Felker Army Airfield, in addition to the Felker Army Airfield tenant missions, would be an added burden to Langley AFB airspace.

Following the initial screening of alternatives, the JBLE–Eustis project team conducted a workshop and developed the following criteria to be used to evaluate and compare project alternatives:

- Ability to meet UFC 3-260-01 vegetation clearance requirements;
- Bird Aircraft Strike Hazard (BASH) Risk;
- Impact to Land-Based Training Operations;
- Environmental Impacts; and
- Cultural Resource Impacts.

The action alternatives (Alternatives 1 – 3) would all meet the UFC 3-260-01 vegetation clearance requirements in the Primary Surface, Clear Zone, and Approach-Departure Clearance Surface Area to the maximum extent practical; however, Alternative 1 would exceed the requirements in Clear Zones 2 and Clear Zone 3, as all trees would be cut to stumps in these areas as opposed to being topped as specified in the criteria. Likewise, Alternative 2 would exceed vegetation clearance requirements in Clear Zone 2, as trees would be cut to stumps as opposed to just being topped. The No Action Alternative (Alternative 4) currently does not meet the UFC 3-260-01 vegetation clearance requirements in the Primary Surface, Clear Zone, or Approach-Departure Clearance Surface Area.

There is an existing BASH risk that under current conditions (No Action Alternative) is approximately in the range of negligible to minor impacts that are not significant. With implementation of any of the action alternatives as compared to the No Action Alternative, BASH impacts could slightly increase in the Primary Surface and the Clear Zone because the removal of trees and shrubs would create open spaces dominated by herbaceous species that could become preferable foraging areas for geese. In addition, implementation of an action alternative would

make permanent and ephemeral open water areas more visible to waterfowl and wading bird species such as herons and egrets. Because of their flight patterns and body type, geese and wading birds are more prone to hit aircraft than other species. However, the cutting of trees to stumps and topping of trees would reduce nesting and foraging habitats for a variety of avian species such as songbirds and would be anticipated to reduce some of the existing BASH hazards. Alternative 1 may present less overall BASH hazards than Alternative 2 or Alternative 3 as dead and dying trees and topped trees may create some preferential perching sites for raptors. However, because of the mixed effects and relative uncertainty associated with prediction of BASH hazards, BASH risk was not found to be a valuable screening criteria as it was anticipated that effects for all alternatives was relatively uncertain and would likely remain in the range in the negligible to minor but not significant impacts. This is also because of the extensive mitigation measures that are currently being implemented with the BASH Prevention Program.

Within the airfield surfaces and the Clear Zone, land-based training operations, which includes navigation training, ambush training, and reconnaissance training, may be negatively impacted by implementation of any of the action alternatives. Because these training operations are affected by visibility of the terrain, these training operations would be negatively impacted by reductions in vegetation cover and vegetation height. Therefore, implementation of Alternative 1 as compared to the other action alternatives would have the most impacts to land-based training operations as trees would be cut to stumps both within Clear Zone 2 and Clear Zone 3. Out of the action alternatives, Alternative 3 would have the least impact to land-based training operations as it would only involve topping of trees in the Clear Zone 2 and Clear Zone 3. Alternative 2 would have intermediary negative impacts to training operations as it involves cutting trees to stumps in Clear Zone 2 and topping of trees in the Clear Zone 3. The No Action Alternative would have no impacts to existing, land-based training operations.

Environmental impacts correspond to the amount of vegetation that would be removed and vegetation maintenance method. As additional tree/vegetation height is removed, it reduces the amount of wildlife habitat and overall increases the impacts to vegetation. While topping of trees and treating topped trees with integrated pesticide management practices may cause tree mortality, some may survive, and topped trees, even if they are dead, provide viable habitat to many wildlife species as opposed to trees stumps. The threatened northern long-eared bat and the endangered Indiana bat that are known to occur at JBLE–Eustis and have the potential to roost in cavities or crevices of dead and dying trees. Therefore, topping of trees would reduce potential impacts to northern-long-eared bat and Indiana bat roosting sites and as such, out of the action alternatives, Alternative 3 would have less impacts to the federally listed bat species. Overall, the No Action Alternative would not cause environmental impacts but out of the action alternatives, Alternative 3 has less environmental impacts than Alternative 1 or Alternative 2.

During the detailed screening of alternatives, potential impacts to cultural resources was considered. During the project planning, however, mitigation measures were identified that would protect the existing cultural resource site in the Clear Zone 1. Therefore, there are no anticipated

adverse impacts to cultural resources with implementation of any of the action alternatives, and all of the action alternatives would have the same impact to the cultural resource site, as all of the action alternatives have tree and shrub removal in the Clear Zone 1 (except in emergent wetlands where trees would be cut to stumps) where the cultural resource of concern is located. Therefore, impacts to cultural resources was not found to be viable screening criteria amongst the action alternatives.

Based on evaluation of the initial and detailed screening, the criteria that best discerned the alternatives were impacts to flight missions and land-based training operations as well as environmental impacts. While the No Action Alternative would have the least amount of impacts to land-based training operations and natural resources, it does not meet the purpose of need of the project. Alternative 3 was selected as the Preferred Alternative as it adequately meets the purpose and need of the project while minimizing impacts to natural resources and land-based training operations as compared to the other action alternatives.

6.0 DESCRIPTION OF PROJECT SITE AND WETLAND IMPACT ANALYSIS

Based on an aerial GIS imagery analysis and field verification, a wetland jurisdictional delineation was completed by the USACE, Norfolk District in May 2015. Figure 6-1 depicts vegetation types and open water within the ROI based on the wetland jurisdictional determination. Table 6-1 provides the estimated acreages of vegetation types in the ROI.

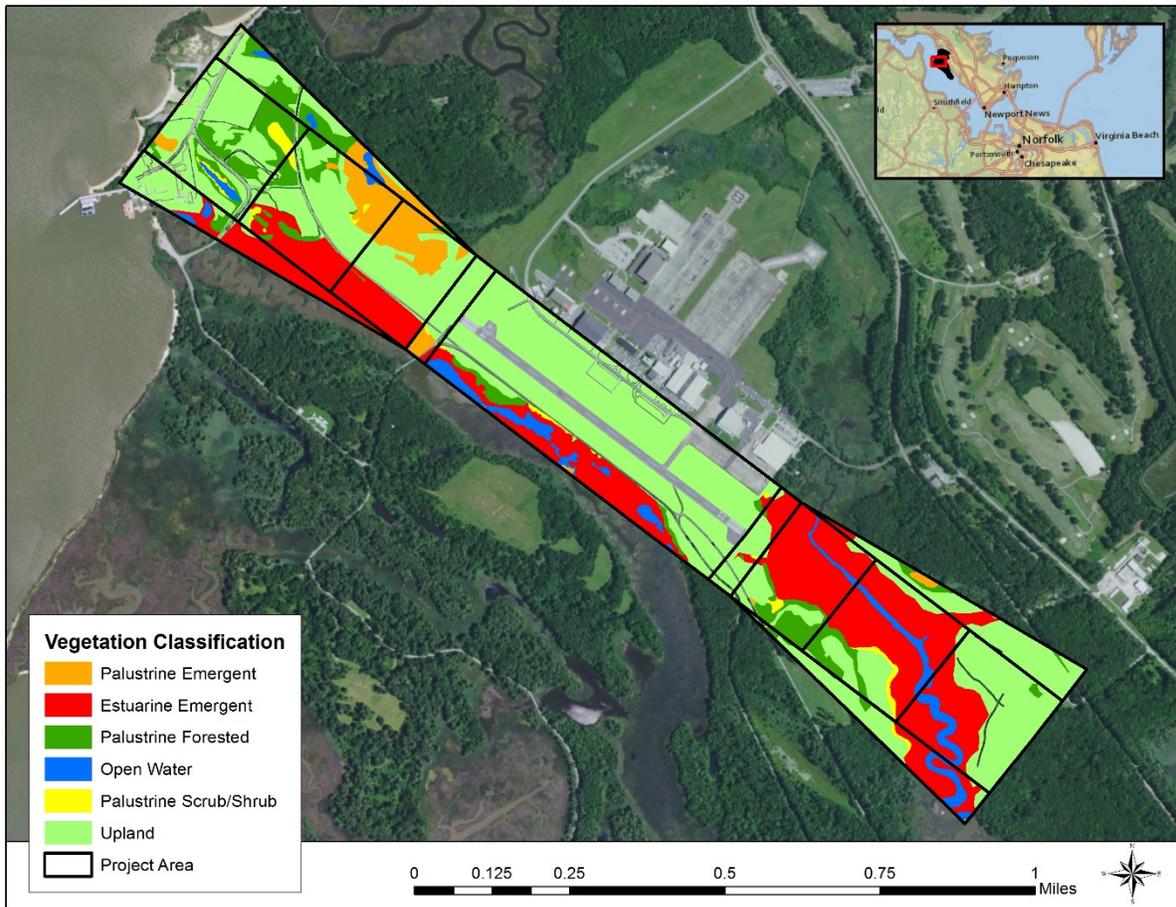


Figure 6-1. Location of open water, wetlands (Palustrine Emergent, Estuarine Emergent, Palustrine Forested, and Palustrine Scrub/Shrub), and uplands in the project area based on the wetland jurisdictional determination conducted by the U.S. Army Corps of Engineers in May 2015

Table 6-1. Estimated acreages of vegetation types in the project area

| Location | Vegetation Classification | | | | |
|----------------------|------------------------------------|-------------------------------------|-------------------------------------|--|-----------------|
| | Estuarine Emergent Wetland (acres) | Palustrine Emergent Wetland (acres) | Palustrine Forested Wetland (acres) | Palustrine Scrub/Shrub Wetland (acres) | Uplands (acres) |
| Primary Surface | 9.69 | 0.14 | 1.63 | 0.25 | 41.21 |
| Clear Zone 1 (North) | 5.37 | 5.80 | 0.10 | 0.05 | 11.11 |

| Location | Vegetation Classification | | | | |
|---------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|--|-----------------|
| | Estuarine Emergent Wetland (acres) | Palustrine Emergent Wetland (acres) | Palustrine Forested Wetland (acres) | Palustrine Scrub/Shrub Wetland (acres) | Uplands (acres) |
| Clear Zone 2 (North) | 5.34 | 3.74 | 2.73 | 0.45 | 9.68 |
| Clear Zone 3 (North) | 0.02 | 0.48 | 5.22 | 1.02 | 13.16 |
| Clear Zone 1 (South) | 12.87 | 0.03 | 3.05 | 0.28 | 5.91 |
| Clear Zone 2 (South) | 13.31 | 0.00 | 1.98 | 0.71 | 5.38 |
| Clear Zone 3 (South) | 7.33 | 0.00 | 0.18 | 0.00 | 13.17 |
| Approach Departure Clearance Surfaces | 10.10 | 2.29 | 4.82 | 0.23 | 22.38 |
| Total Acres | 64.03 | 12.47 | 19.71 | 2.98 | 122.00 |

Light Detection and Ranging (LIDAR) data that was collected at the JBLE-Eustis in 2014 was converted to a Digital Surface Model and Digital Elevation Model in ArcMap 10.3.1 to assess vegetation heights in the project area to be used in the impact analysis. For this analysis, only wetlands requiring compensatory mitigation were included in the impact analysis; therefore, the impact analysis is limited to those permanent, wetland impacts that would occur in the Primary Surface and the Clear Zone 1 where tree removal and associated soil disturbing activities would occur. Trees were identified in the LIDAR analysis as those points exceeding 15 feet in height from the ground surface.

Because the LIDAR analysis is based on canopy impacts not soil disturbance impacts, the acreages of estimated impacts are overestimated at a ratio of approximately 4:1. Based on the results of the wetland jurisdictional determination and the LIDAR vegetation height analysis, the wetland impacts requiring mitigation where there will be soil disturbance and vegetation removal are depicted in Figure 6-2. The estimated acreages of wetland impacts based on the LIDAR analysis requiring mitigation are described in Table 6-2.

Figure 6-2. Estimated wetland impacts requiring mitigation in the Region of Influence

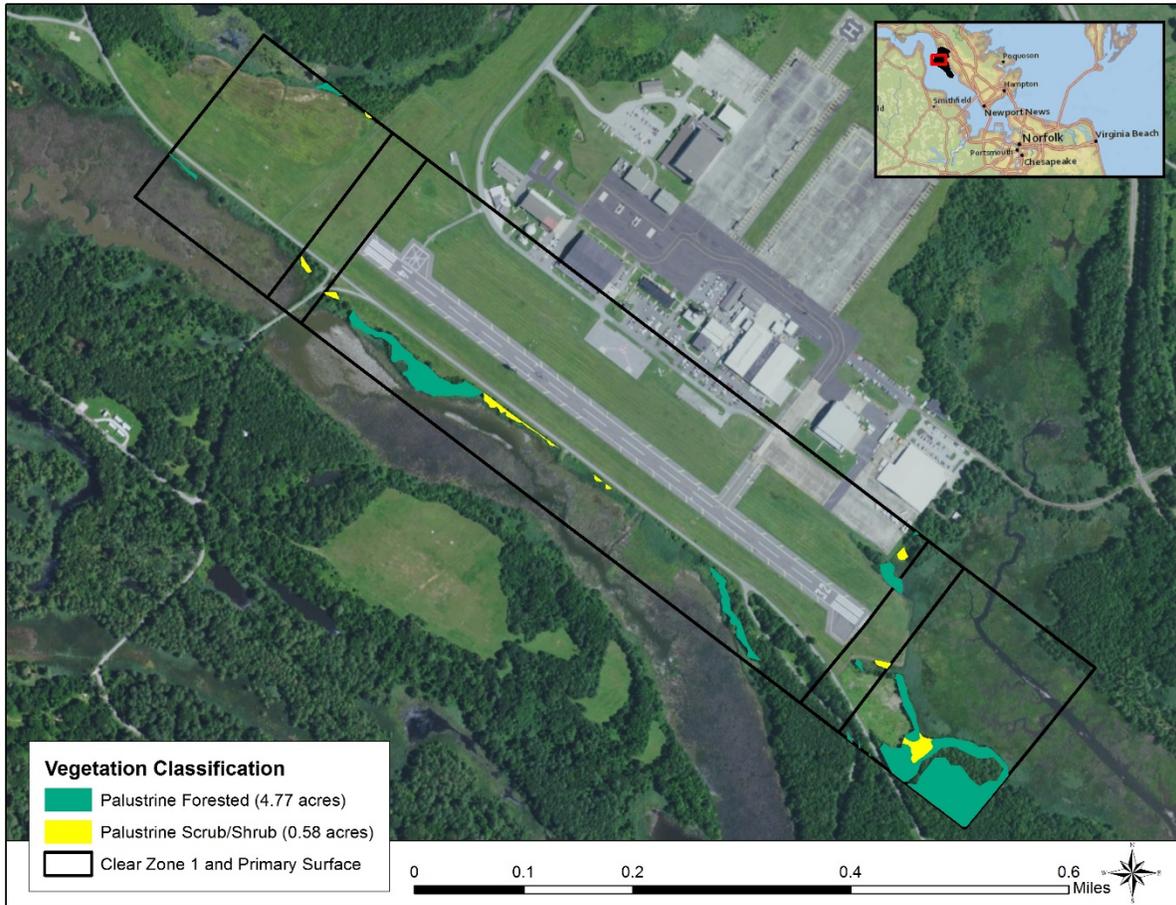


Table 6-2. Estimated wetland impacts requiring compensatory mitigation. Wetland impacts are overestimated at an estimated ratio of 4:1 because the Light Detection and Ranging analysis is based on a canopy analysis.

| Location | Wetland Classification | |
|------------------------------|-------------------------------------|--|
| | Palustrine Forested Wetland (acres) | Palustrine Scrub/Shrub Wetland (acres) |
| Primary Surface | 1.62 | 0.25 |
| Clear Zone 1 (North) | 0.10 | 0.05 |
| Clear Zone 1 (South) | 3.05 | 0.28 |
| Total Acres of Impact | 4.77 | 0.58 |

7.0 COMPENSATORY WETLAND MITIGATION

Per the Virginia Water Protection Program regulation, compensatory mitigation is defined as "actions taken that provide some form of substitute aquatic resource for the impacted aquatic resource" (9 VAC 25-210-10). In Virginia, compensatory mitigation may include the following:

- Purchase or use of wetland mitigation bank credits at a Virginia Department of Environmental Quality (VDEQ)-approved mitigation bank
- Contributing to a VDEQ-approved in-lieu fee fund
- Wetland creation or restoration
- Stream restoration (see the Unified Stream Methodology below)
- Preservation of existing wetland and streams, when utilized in conjunction with creation, restoration, or mitigation bank credits
- Preservation or restoration of upland buffers adjacent to surface waters, when utilized in conjunction with creation, restoration, or mitigation bank credits

The compensation ratios below are generally accepted, especially when compensation is required for a 401 Virginia Water Quality Certification or a Section 404 permit as issued by the USACE, Norfolk District:

- 2 acres compensation for each 1 acre of impact (2:1) for forested wetland impacts
- 1.5 acres of compensation for each 1 acre of impact for scrub-shrub (1.5:1) wetland impacts
- 1 acre of compensation for each 1 acre of impact (1:1) for emergent wetland impacts

Based on coordination with the USACE, the standard mitigation ratios are anticipated to apply for implementation of the Preferred Alternative. The USAF plans to implement wetland mitigation acreages that are provided in Table 6-2. This would exceed the required mitigation as required per the Clean Water Act, Section 404 requirements because the LIDAR analysis overestimated vegetation impacts by a ratio of approximately 4:1. However, this additional mitigation would be used to help offset impacts to the CBPA Resource Protection Areas that would be impacted from the tree removal that would occur in the Primary Surface and the Clear Zone 1 (The compensation ratio for tree removal within Newport News is a 3:1 ratio within RPAs).

Wetland mitigation credits will be purchased from an approved mitigation bank or in-lieu fee program. The selection of the approved mitigation bank or in-lieu fee program and the determined quantity of mitigation credits will be coordinated with the USACE and the VDEQ during the permitting phase of the project. Per the order of preference stated in the Mitigation Rule, mitigation credits will first be attempted to be purchased within a mitigation bank and if these are not available they will then be purchased via an in-lieu fee program.

The amount of mitigation credits to be purchased and the mitigation bank or in-lieu servicing fee program that will be used will be coordinated and finalized during the permitting phase of the project when the Clean Water Act, Section 404 Permit and the Virginia Water Protection Permit 401 Water Quality Certification will be obtained.

Approved by:

David F. Kattler, Colonel, USAF
Chief, Civil Engineering Division

DATE