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ENVIRONMENTAL MANAGEMENT OFFICE
FORT LEE

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
FY 2021 – FY 2025

U.S. Army Garrison Fort Lee

Directorate of Public Works

Environmental Management Division

December 2020

INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

U. S. Army Garrison Fort Lee

Fort Lee, Virginia

APPROVAL

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. 670a *et seq.*) as amended in the Sikes Act Improvement Act of 1997 and the Department of Defense Instruction (DoDI) 4715.03 Natural Resources Conservation Program. This document was prepared and reviewed in coordination with the Department of the Interior, acting through the U.S. Fish and Wildlife Service, and the Virginia Department of Wildlife Resources.

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I. MANAGEMENT OVERVIEW

A. Purpose & Scope

The last signed Integrated Natural Resource Management Plan (INRMP) covered a post-BRAC period in which Fort Lee had almost doubled in size in terms of built space and personnel. Since that time, the installation has continued to grow with follow-on construction projects and re-tooling of the military mission. The landscape has continued to change in smaller units than with BRAC but with results almost as dramatic. The purpose of this document is to reconcile those changes into a forward-looking revision. The INRMP will provide a prescription for future environmental stewardship and its implementation in the context of the military mission, with the intent of no net loss of readiness capability.

This INRMP covers the entirety of Fort Lee as it exists on 5907 acres in central Virginia. The installation acreage includes a 1,600acre Range Complex, a 400-acre Ordnance Campus, and a nearly 3,800-acre Cantonment area separated only by state highways. There are also three separate small parcels totaling almost 58 acres. The satellite parcels include a 4-acre water training site on the Appomattox River, a 52-acre wooded parcel on the east side of I295, and a 2 acre parcel in the median of I295. The 2-acre parcel is not recognized by the installation for any use. The 52-acre parcel is only used for hunting, as it has no legal road access, and is entered only through an arrangement with private landowners.

B. Goals & Objectives

The primary goal of the INRMP is to provide a comprehensive document designed to integrate the conservation, management, and recreational use of natural resources in concert with the military mission, resulting in the maintenance of expected biodiversity with no net loss of military readiness or training opportunity.

Objectives include the need to:

- Manage ecosystems to protect, conserve, and enhance native flora and fauna with an emphasis on biodiversity conservation.
- Collaborate with Trainers to integrate conservation measures with military operations.
- Identify natural resource recreation and management opportunities compatible with environmental stewardship and the military mission.
- Guide the professional enforcement of natural resources related laws.

- Continue to build cooperation with the US Fish and Wildlife Service (USFWS) and the State, relative to the proper management and protection of natural resources, and listed species.
- Serve as a principle information source for NEPA analyses.
- Document requirements for the natural resources budget.

C. Review, Revision, and Reporting

Pursuant to the Sikes Act, INRMPs must be reviewed as to operation and effect on a regular basis, but no less often than every 5 years, by DoD, USFWS, NOAA Fisheries Service (if applicable) and State fish and wildlife agencies. This review must be documented and signed by these parties. The Fort Lee Environmental Management Division conducts annual reviews of its INRMP. Any edits, updates, or modifications are submitted to the State and USFWS by 15 March each year. The agencies may concur or request additional supporting information. At the end of five years, there is a full review for operation and effect and if substantive changes are needed, there is a revision and a new document is generated. The new document will be reviewed in house and then at the Region level. Once in approved draft form, it will be distributed to the State, USFWS and local Tribes for concurrence. Any changes will be incorporated to produce a final version approved by the three government signatories. The final version will be routed first to the USFWS for signature, second to the State for signature, and then finally to the Garrison Commander. The signed copy will be forwarded through the Region to HQ IMCOM G4, with copies retained at the Installation.

If there are no substantive changes required after five years, the existing INRMP can be re-submitted to the State and USFWS for concurrence, with a letter supporting the lack of changes. Once any recommended edits by the outside agencies have been incorporated, the document can be redistributed for signatures in the same sequence as a new INRMP. The important point to note is that Installations should strive to maintain an INRMP with signatures no more than 5 years old.

This revision was undertaken to address the changes and requirements associated with a new listed species and new candidate species, in conjunction with increased training tempo and the construction of new training and living areas.

II. INSTALLATION OVERVIEW

A. General Info

Fort Lee encompasses approximately 5,907 acres of land on both sides of Highway 36 in Prince George County, Virginia. The installation is situated in the east-central portion of the state on the inner part of the Mid-Atlantic Coastal Plain, 25 miles south of Richmond. Fort Lee lies between the cities of Petersburg and Hopewell in a metropolitan area known as the Tri-Cities (Petersburg, Hopewell, and Colonial Heights), which is situated on the Appomattox River near its confluence with the James River. Petersburg National Battlefield Park (NPS), which provides a local and regional historical perspective on the Civil War, borders the southwestern portion of the installation. Land to the south of the installation borders Blackwater Swamp, the headwaters of the Blackwater River. Land use immediately adjacent to Fort Lee is a mixture of recreational, residential, commercial, and agricultural. State and federal correction facilities are located adjacent to the operational areas north of River Road.

B. Regional Land Use and Setting

Significant adjacent land uses include predominantly low density residential, woodlands, and open space. On the north and west, the Appomattox River separates the installation from the City of Colonial Heights and Chesterfield County. Municipalities and private landowners, as well as the proximity of NPS lands add to the complexities of ecosystem management as it pertains to shared ecosystems across Fort Lee's boundaries. Issues related to landowner rights, as well as land use and zoning policies of the local jurisdictions will affect decisions made to manage off-post components of Fort Lee's shared ecosystem. The NPS will likely cooperate in managing shared ecosystems since both Fort Lee and the NPS are federal landowners with ecosystem responsibilities. Unlike many larger installations, Fort Lee is not a viable location for the ACUB program. The installation is bounded mostly by other federal land, interstate highway, state roads, or extensive wetlands. Areas where these features do not exist are occupied by existing businesses or residential housing. The only areas where private greenspace or undeveloped land lies adjacent to the installation is predominantly opposite family housing, and not training land. There are very few opportunities for Compatible Use Buffer arrangements at Fort Lee.

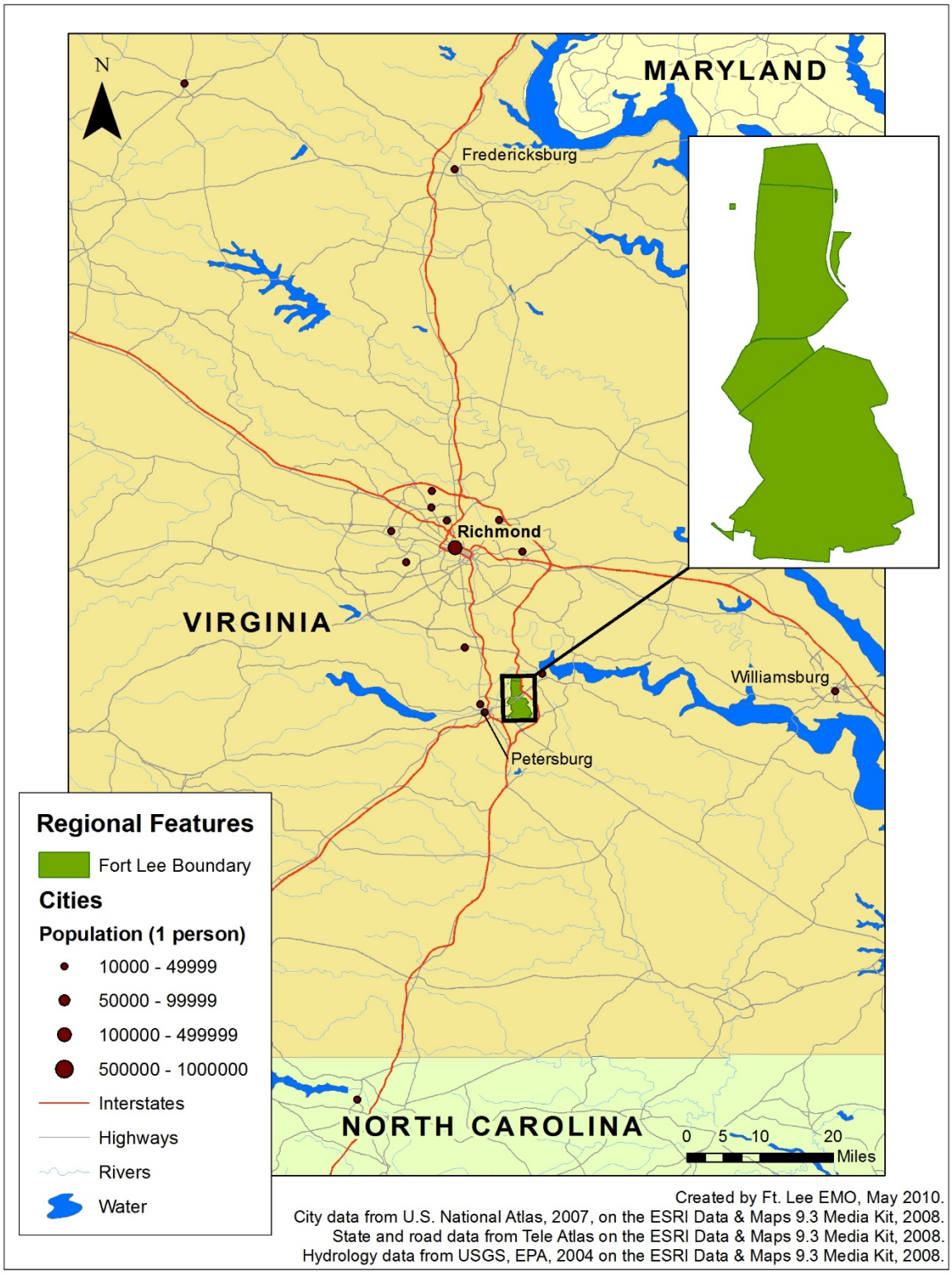

Figure 1. Regional Setting

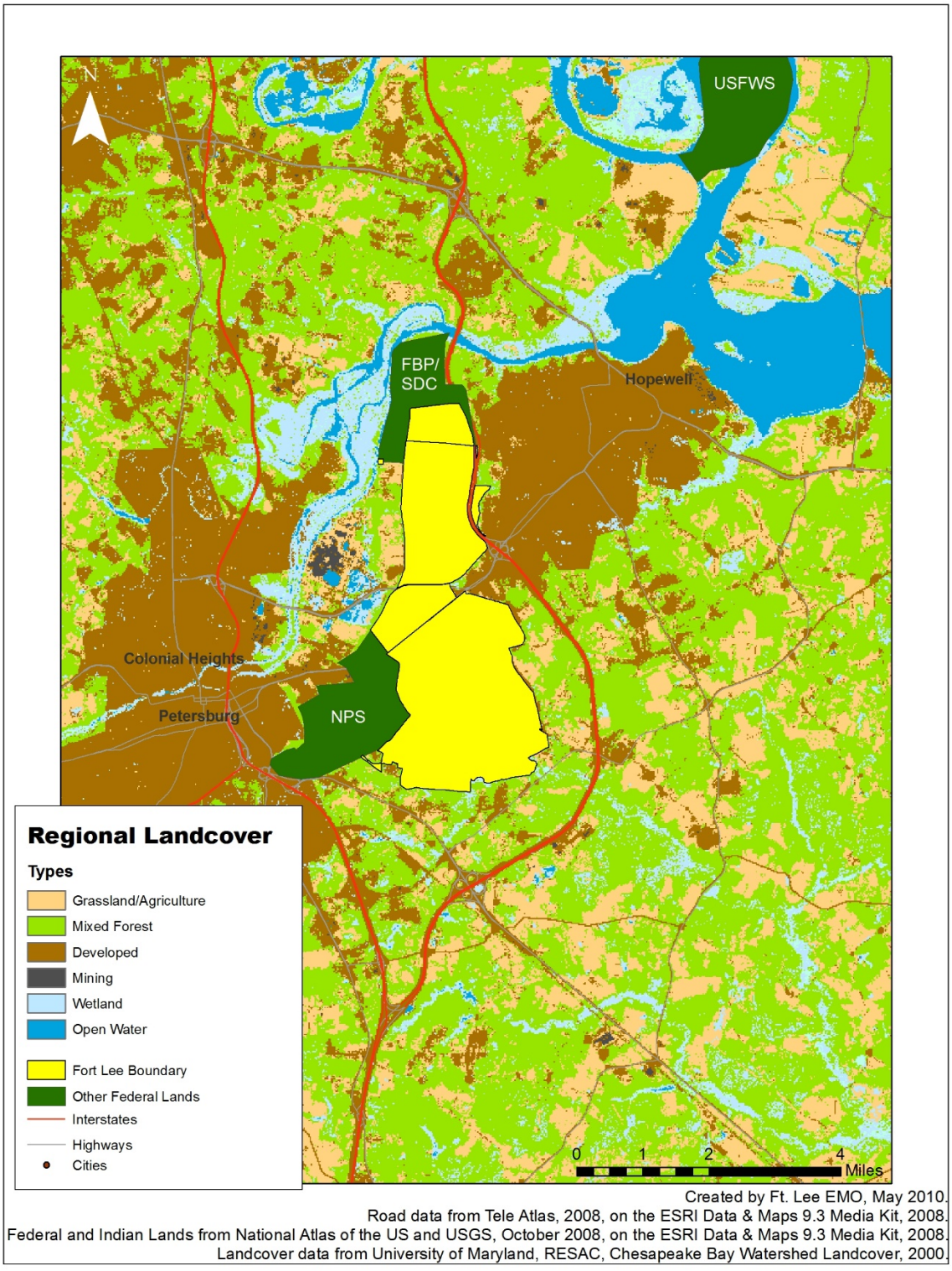

Figure 2. Regional Landcover

C. Natural Environment

The region's flora and fauna are affected by two major environmental influences: one, geographic; the other, anthropogenic. First, the Appomattox-James River confluence rests on the inner edge of the Outer Coastal Plain Mixed Forest Province (Bailey 1989). It is characterized by wetlands, tidal flats, sand and gravel deposits, and mixed deciduous/pine forest types. The geographic break at the James River is a floral and faunal subdivision break within this ecoregion forming a natural boundary for many species. Swamp tupelo (*Nyssa biflora*), longleaf pine (*Pinus palustris*, and giant cane (*Arundinaria gigantea*) occur on, or near, Fort Lee and points east and south, but only rarely to the north. Red-cockaded woodpeckers (*Picoides borealis*), brown-headed nuthatches (*Sitta pusilla*), cottonmouth moccasins (*Agkistrodon piscivorous*), hispid cotton rats (*Sigmodon hispidus*) and southern short-tailed shrews (*Blarina carolinensis*) are faunal species similarly distributed. Fort Lee's presence at the inner edge of this ecoregion also predisposes it to species associated with the adjacent ecoregion. Locally, this is the Virginia Piedmont, but it falls within the larger Southern Mixed Forest Region. Fort Lee enjoys the benefits of biodiversity formed from a mix of species with southern affinities juxtaposed with those from Piedmont and northern habitats.

The anthropogenic influence on the installation lies in the interspersion of forest, farms, and development that have created a mosaic of habitats in central Virginia heavily influencing the floral and faunal communities that can exist there. Because of this patchwork of habitats, the region is more susceptible to exploitation by generalist species, and frequent disturbance events lend the area a greater susceptibility to the spread of exotic and invasive species, both plant and animal. This is borne out in a constant battle to maintain quality training areas free of natural impediments.

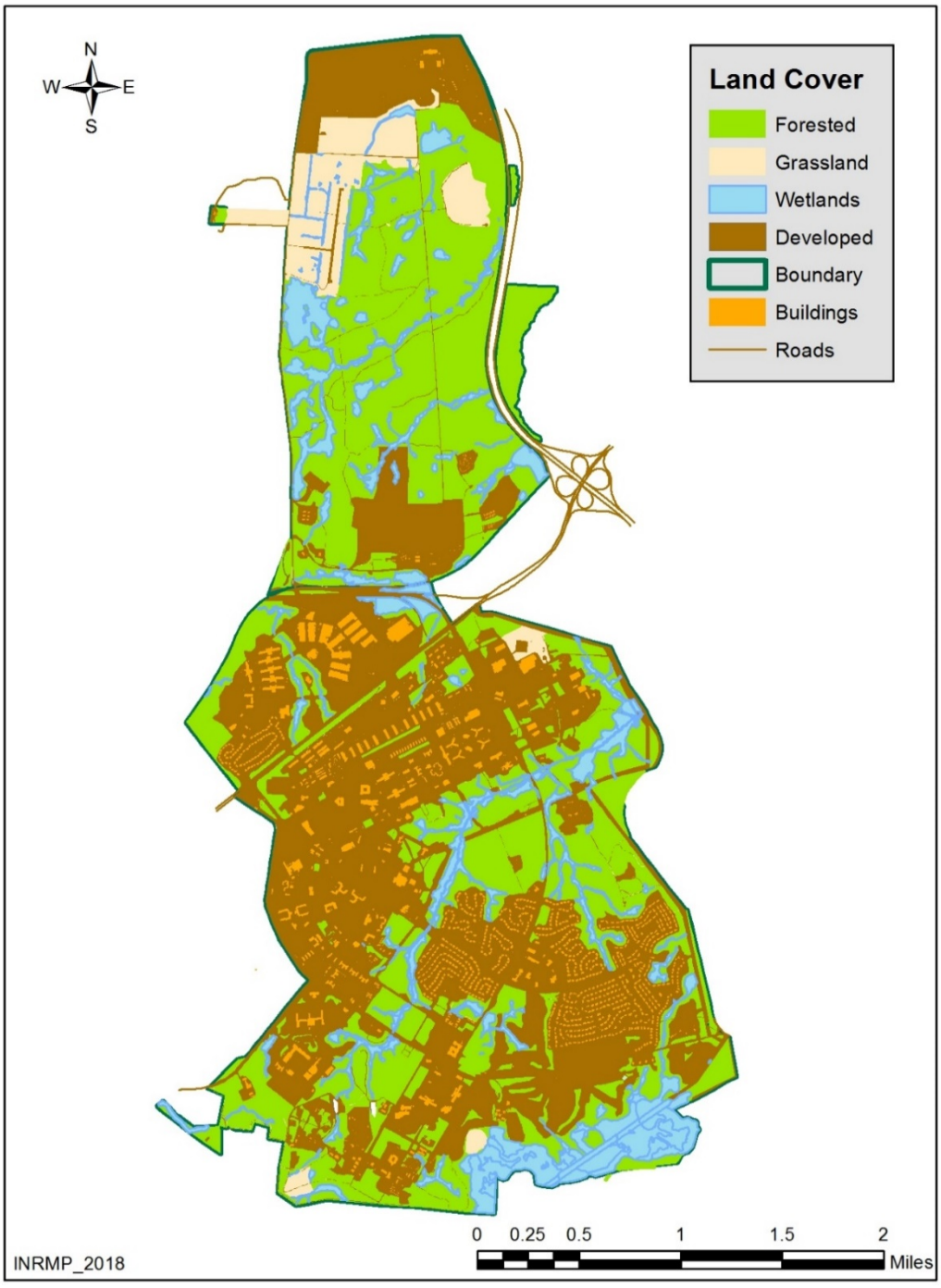

Figure 3. Fort Lee Land Cover

D. Current Military Missions

Fort Lee is a focal point for Army Logistics and supports Army joint and coalition operations around the world. It is the home of the Combined Arms Support Command (CASCOM), a Military Entrance Processing Station (MEPS), and the headquarters for both the Defense Commissary Agency (DeCA) and the Defense Contract Management Agency (DCMA). The Army Logistics University and Army Quartermaster School reside at Fort Lee and during the last BRAC action realignment, both the Army Ordnance School and Army Transportation School relocated to the installation (USACE 2007). Additionally, the joint Air Force and Navy Culinary School operates out of Fort Lee along with the Air Force Transportation Management Program.

More than 70,000 troops pass through Fort Lee's classrooms each year, making it the third largest training site in the Army. Most students attend Advanced Individual Training (AIT) courses at one or more of the Schools. Time in the field is mostly spent conducting live fire exercises, land navigation skills, field training exercises, or officer leadership courses, depending on position or Military Occupational Specialty (MOS). Live fire exercises on Fort Lee are limited to small arms due to range constraints.

In September 2018, TRADOC distributed TASKORD 182213-TC 18-4 Guidance and Required Actions to identify way of increasing rigor and solidarization processes in AIT courses. This need for increased rigor and warriorization was codified in TRADOC Regulation (TR) 350-6: Enlisted Initial Entry Training Policies and Administration. At a minimum, and IAW published AIT strategy, the intent was to ensure physical training included tactical road marches and MOS task training under tactical conditions, whenever possible. Additional training considerations included participation in grenade assault course and individual weapons qualification, to include night fire. This had the immediate effect of demanding more training land and more extensive use of existing training areas.

In the months since FY 2018 Fort Lee has established seven new training areas and enlarged two existing ones, all within the existing footprint of the Cantonment area. This has placed a premium on maximizing the available training footprint within a matrix of cultural and natural resource constraints. Additional field teams were brought in to finalize archeological surveys, and regular meetings were held with regulators to facilitate the permitting processes for both wetlands and cultural issues. The

contribution of these efforts allowed for the designation of the new training land, and may have forever changed the landscape and ecology of Fort Lee.

The changes in training may be resulting in impacts to natural resources. An increased footprint and frequency of training has resulted in a reduction in hunting opportunities and hunting areas. This may ultimately affect the ability to manage the deer herd through hunting. Fort Lee is just finishing the first year of these new changes, so nothing can be shown at this time. Additionally, frequent Soldier use of these new areas is resulting in denuded trails and destruction of understory and some mid-story vegetation. There already appears to have been substantive changes in bird density and species assemblages in many areas, although this has not been statistically shown.

E. Public and Affiliates Access

With the establishment of the perimeter fence and additional vetting procedures for gate access, there are limited public opportunities on Fort Lee. The Quartermaster Museum, Women's Museum, bowling alley and fast food outlets are the primary public-access facilities on post. All installation access requires a background check. Once a visitor has completed a background check with their current Driver's license (DL), they are vetted and can come and go with that DL. If the Threat Level increases, these standards are subject to change in which case visitors should consult the Fort Lee website, or contact the Installation by phone. Once access is received, visitors can attend community events, dine at the installation restaurants, visit museums, bowl and use the privately-owned weapons range. For other activities like hunting, golf, or other sports a visitor would need a sponsor or be in the company of a Common Access Card (CAC) holder.

Because of the limited amount of greenspace on Fort Lee that is not already part of a Training Area or Range SDZ, there are no publicly available trails or outdoor areas for use to the public.

III. INTEGRATION OVERVIEW

A. Authority and Responsibilities

Congress established the Sikes Act in 1960 to manage DoD lands for wildlife conservation and public access. The Sikes Act was amended in 1997 to develop and

implement mutually agreed upon INRMPs through voluntary cooperative agreements between the DoD installations, the USFWS, and the respective State fish and wildlife agency. In accordance with the Sikes Act, the Secretary of the Army shall determine which installations have significant natural resources and will be mandated to complete an INRMP.

An installation has significant natural resources and shall develop and implement an INRMP if ANY of the following criteria apply:

- Federally listed, proposed, or candidate species are onsite, or critical habitat has been designated or proposed on the Installation.
- Reimbursable forestry or agricultural out-leasing activities consist of 100 acres or more.
- Hunting and fishing are allowed for which special State hunting and fishing permits are issued by the Installation in accordance with the Sikes Act.
- Unique biological resources, wetlands, species at risk, or ecological issues require a level of planned management that can only be addressed by an INRMP.
- The Installation conducts intensive, on-the-ground military missions that require conservation measures to minimize impacts and sustain natural resources. Installations designated by G3 for management under the Integrated Training Area Management Program meet this criterion.

Fort Lee meets four of these five listing criteria and is therefore mandated to complete an INRMP under the Sikes Act (16 U.S.C. 670a-670f, as amended).

B. Internal Stakeholders

Garrison Command - The Garrison Commander is responsible for oversight of the day-to-day administration of the post and is assisted by a command staff, including the Deputy Commander, Command Sergeant Major, Equal Opportunity Office, Inspector General, Public Affairs Office, and Chaplain. The Garrison Commander is responsible for providing Installation-wide support to implement the INRMP.

Directorate of Public Works (DPW) - The DPW provides, manages, maintains, and sustains facilities, infrastructure and land through integrated planning and coordination. This Directorate ensures the installation complies with federal and state environmental laws and regulations through its Environmental Management Division (EMD). The EMD is the primary organization responsible for implementing this INRMP. They are responsible for natural and cultural resources, water quality (includes

stormwater management, drinking water, wetlands, and Chesapeake Bay Initiatives), installation restoration, National Environmental Policy Act (NEPA) compliance, air quality, hazardous waste management, pest management, and pollution prevention. Within DPW, the Master Planning Office works to ensure development is planned and carried out in concert with natural resource stewardship, through its close coordination with EMD.

Directorate of Plans, Training, Mobilization and Security (DPTMS) - DPTMS provides sustained operations support to the Installation in the functional areas of ranges and training areas, training ammunition, land management, Reserve/National Guard training support and formal schools. They develop, coordinate and execute plans for force protection, security/intelligence, mobilization and deployment. DPTMS, particularly its Training Division, is the interface between EMD and troops training in the field. DPTMS is responsible for managing the Fort Lee Sustainable Range Program and provides the overall approach for improving the way in which it designs, manages, and uses its ranges and training lands to ensure long-term sustainability, which includes the core program areas of the Range and Training Land Program (RTLP) and the Integrated Training Area Management (ITAM) program.

RTLP is comprised of Range Operations and Range Modernization. Range Operations is the single point of contact for control, scheduling, usage, and organizational maintenance of ranges, training lands, and related facilities to include the releasing training areas for forestry, land rehabilitation, and recreational use. Range modernization, in support of developing and improving Army ranges, integrates three primary considerations - mission support, environmental stewardship, and economic feasibility. The Range Modernization planning process is a coordinated effort at the installation, IMCOM, and HQDA levels.

ITAM is a core component of the Sustainable Range Program (SRP) and is responsible for maintaining training land to ensure Fort Lee Units are able to meet current and future institutional and operational live training requirements, field craft / warrior tasks, and battle drills per the Advanced Individual Training (AIT) Transformation Strategy, TR 350-6, Soldier Training Publication (STP) 21-1-SMCT, STP 21-24-SMCT, and Program of Instruction (POI) requirements. To accomplish this mission, ITAM relies on its five components and management by HQDA G3/5/7 (DAMO-TRS), the ITAM Lead Agent (TCM Ranges), and IMCOM SRP. The five components of ITAM include Training Requirements Integration (TRI), Land Rehabilitation and Maintenance (LRAM), Range and Training Land Assessment (RTLA), Sustainable Range Program Geographic

Information System (SRP GIS), and Sustainable Range Awareness (SRA). The SRA produces Soldier Field Cards that document environmental considerations for Soldier awareness and is given to every Soldier that attends the Range and Training Area briefing.

The Training Division also maintains the Fort Lee Range Complex Master Plan (RCMP) which serves as the foundation for planning efforts required by AR 350-19, The Sustainable Range Program; AR 200-1, Environmental Protection and Enhancement; AR 210-20, Real Property Master Planning; DFAS-IN Manual 37-100; and the Army Training Land Strategy. The RCMP synchronizes the multiple management activities effecting all resources and facilities on Fort Lee. Creating and reviewing/updating the RCMP ensures that all facility modernization and land management activities are complementary and focus on supporting the installation's training mission. The RCMP integrates mission support, environmental stewardship, and economic feasibility and defines procedures for determining range projects and training land requirements to support live-fire and maneuver training. The planning process occurs annually and undergoes environmental review and Command approval.

It is only because of the close rapport and mutual respect between Range Division staff and EMD that Fort Lee enjoys such success in natural resource management and protection while still fulfilling the requirements of the military mission.

Directorate of Family, Morale, Welfare and Recreation (DFMWR) - The Directorate of Family, Morale, Welfare, and Recreation promotes organization and development of recreational activities and facilities. Within this Directorate, the Outdoor Recreation Program coordinates the hunting program in close association with wildlife management goals recommended by EMD and with assistance from PMO's Conservation Officer(s). They also offer a full suite of recreational opportunities both on and off-post that meet the needs of Soldiers as well as family members and civilian employees.

Provost Marshal (PM) - The Provost Marshal serves as the Chief Game Warden on the installation, enforcing hunting regulations. The Provost Marshal's Office normally maintains at least one full time Conservation Officer to assist in these duties.

Staff Judge Advocate (SJA) - The SJA office provides legal advice and service to Fort Lee's past, present, and future warriors, and Garrison personnel. They review all NEPA documentation for the Garrison Commanders signature and provide legal counsel as warranted on environmental issues.

Other Installation Organizations - Implementing this plan requires assistance of other directorates and organizations on the installation. Such support organizations include the Directorate of Resources Management (budget, personnel, and equipment authorizations), Military and Installation Contracting Command (purchasing, contracting), and Public Affairs Office (information awareness & dissemination).

U.S. Army Corps of Engineers - The U.S. Army Corps of Engineers is the primary proponent for wetland regulations under Section 404 of the Clean Water Act (CWA). The wetlands regulator is located in an office in Richmond, VA, but serves the needs of Fort Lee and surrounding counties. The Norfolk District Corps office has a construction branch located on Fort Lee, which manages all military construction projects on the installation.

HQ IMCOM – The Installation Management Command (IMCOM) is a support formation of the Army responsible for the day-to-day management of Army installations around the globe. It integrates and delivers base support to enable readiness for a globally-responsive Army. This is done on 75 Army installations in 12 countries across the world. IMCOM Headquarters is located at Fort Sam Houston in San Antonio, TX and hosts much of the required training that Garrison staff need to fulfill their missions for the Army.

Army Environmental Command - The Army Environmental Command is a subordinate command of IMCOM and has the mission of providing oversight, centralized management, coordination, and execution of Army environmental programs and projects. It has support capabilities in Compliance, Conservation, Pollution Prevention, and Restoration, to include the Military Munitions Response Program.

C. External Stakeholders

1. Federal Agencies

U.S. Fish and Wildlife Service (USFWS) - The USFWS is one of the three entities in the tripartite agreement identified by the Sikes Act as a proponent of the INRMP. They have a regulatory stake in the stewardship and conservation of federally listed plant and animal species, and it is incumbent upon them to participate in the development of planning level documents on federal facilities that address such issues. The Ecological Services Field Office of the USFWS, located in Gloucester, Virginia, has the primary role of coordination with the Installation on wildlife resource issues, including Endangered Species Act Consultation (ESA), Migratory Bird Treaty Act (MBTA) issues, and review and commentary on the INRMP.

National Park Service (NPS) - As an adjacent neighbor to Fort Lee, Petersburg National Battlefield Park has an interest in the management of the Installation's natural resources. Impacts to lands on Fort Lee may have indirect consequences to the natural communities of the Park. The natural resource managers from both NPS and Fort Lee stay in contact regularly, and collaborate as needed on natural resource issues that affect both entities. Also, under a joint agreement between the Park Superintendent and the Garrison Commander, military units are allowed access to roads and trails in the Park for morning runs prior to the Park opening to the public. Because of physical proximity and shared natural resources, the Installation will provide copies of the INRMP to the NPS once approved.

Natural Resources Conservation Service - The Natural Resources Conservation Service, formerly the Soil Conservation Service (SCS), is available to work with Fort Lee on soil and erosion control projects. The Installation has a relatively recent soil survey, but may use NRCS expertise on field projects either directly, or indirectly, through one of the other Installation stakeholders.

U. S. Environmental Protection Agency (EPA) - Fort Lee follows regulations set forth under the Clean Air Act (CAA) and CAA Amendments as implemented by the United States Environmental Protection Agency (EPA) and through the Virginia Department of Environmental Quality (VADEQ) Air Pollution Control Program. The CAA standards are also implemented into Army Regulation 200-3. Fort Lee falls under the jurisdiction of the air programs administered by EPA Region 3 (Philadelphia) and the VADEQ Piedmont Regional Office.

Chesapeake Bay Program Office (CBP) - The Chesapeake Bay Program (CBP) in Annapolis, MD, was established in 1983 to serve as the lead federal agency for the Chesapeake Bay restoration effort. The EPA, working through Region 3 and the Office of Water, operates the CBP. The EPA Administrator represents all federal agencies as the federal signatory to the Chesapeake Bay Agreement and serves on the Chesapeake Bay Executive Council.

The CBP is a unique partnership between federal and state agencies. The partnership focuses on undertaking cooperative efforts to reduce nutrients, prevent toxic pollution, restore habitat and living resources, and coordinate research. The CBP directs and conducts the research and projects associated with restoring the Chesapeake Bay. As such, the CBP can provide technical assistance and other resources that are needed for Fort Lee to implement Bay related projects (e.g., wetlands restoration, pollution prevention opportunity assessments, and Total Maximum Daily Load [TMDL] compliance).

2. State Agencies

Virginia Department of Wildlife Resources (VDWR) - VDWR is the state analog to the USFWS and comprises the third party to the INRMP tripartite agreement. They have a regulatory stake in the protection and management of state and federally listed fish and wildlife species. VDWR interacts annually with Fort Lee on game management issues and has provided a valuable role in the development and monitoring of its deer management program. The agency also has an ongoing relationship with EMD on migratory bird issues and the recognition of conservation initiatives to achieve biodiversity goals. VDWR is a permitting authority for Fort Lee on projects that require trapping and/or handling wildlife.

Virginia Department of Environmental Quality (VADEQ) - This agency is the coordinator for state agency review of NEPA documents. They receive and disperse NEPA documents and provide the consolidated State response. They also maintain numerous regulatory programs integral to activities on Fort Lee. Among those are the Virginia Pollutant Discharge Elimination System permit program, the Virginia Pollution Abatement permit program, and the Virginia Water Protection permit program, which has assumed oversight over many of the CWA permits formerly associated with the USACE.

Virginia Department of Forestry (VDOF) - Although infrequently contacted, DOF provides periodic expertise and guidance on forest health and management issues. They have also been an annual supporter of Earth Day events often providing plants and trees.

State Historic Preservation Office (SHPO) - Fort Lee routinely consults with the Virginia State Historic Preservation Officer to ensure compliance with Section 106 of the National Historic Preservation Act. In accordance with 36 CFR 800.14, the Garrison has recently signed a Programmatic Agreement to streamline the review of routine management activities necessary to meet the Army mission.

D. Internal Integration

Integration of the INRMP within Fort Lee occurs primarily through two routes: the NEPA process and the Integrated Training Area Management (ITAM) program. In evaluating actions through NEPA the INRMP is instrumental in assessing the status of natural resources and the potential impacts from Army actions. It is the primary source for data mining on natural resources, particular for regulatory components such as federally-listed species or wetlands. It is used both in-house for evaluating NEPA actions and distributed to outside contractors as needed. Likewise, the ITAM program depends on the INRMP for up to date information on forestry and wetlands and any significant wildlife or plant resources, as it relates to the management of training areas. The Range Complex Master Plan (RCMP), which documents U.S. Army Sustainable Range Program (SRP) goals and objectives for supporting live military training for the three SRP core program areas: Range Operations, Range Modernization, and ITAM, is developed and maintained by Range Operations, under DPTMS. Unlike the INRMP, the RCMP is updated annually and requires annual validation. The INRMP and the RCMP are routinely reviewed and synchronized between Range Operations and Environmental, and each keeps the other informed when an update becomes available.

IV. PROGRAM ELEMENTS

A. GIS

Geospatial data has long been associated with natural and cultural resource management. The ability to assign geographic coordinates to land based features and project them digitally onto maps is fundamental to documenting and understanding ecological data. That is why the natural resource manager typically has a working knowledge of GIS. Fort Lee is no exception. The natural resource manager has occasionally doubled as the Installation Geographic Information & Services (IGI&S) coordinator. Geospatial data is routinely used to define wetland boundaries, forest stands, sensitive plant locations, and T&E species sites. But GIS covers far more than

natural resources. The Environmental Management Division tracks the entire suite of environmental and infrastructure resources to include underground and above-ground storage tanks, satellite accumulation sites, IRP sites, landfills, roads, buildings, utilities and other infrastructure. The GIS system is comprehensive with respect to including all things associated with the natural and built environments that are monitored or tracked by Fort Lee.

Integral to the usefulness of GIS data is the ability to visualize data on the natural landscape. This is especially important on an installation as active as Fort Lee in terms of construction and mission changes. Fort Lee has experienced continued follow-on growth to complement the 4.3M sq. ft. of construction from the 2005 BRAC build-up. Troop levels have continued to increase with training now occupying 24 out of 28 active Training Areas simultaneously in the Cantonment. It is imperative that we be able to monitor the effects on the landscape of this increase in training and construction. Fort Lee has done this reasonably effectively over the last decade through acquiring updated aerial imagery on a three-year cycle. This INRMP will seek to maintain that frequency given the need to monitor restoration projects, as well as habitat health over time from training impacts.

Once GIS data is collected or acquired, it is organized according to standardized Army protocols and maintained in a server-based geodatabase. Quarterly submissions are made to the Region in accordance with their requirements to populate a Regional database of primary data for each installation. The installation has a dedicated IGI&S Manager that resides within the Master Planning Division. In that capacity he is integral to the management of real property assets and development opportunities. He assists other Directorates as needed and maintains a data sharing relationship with both IMCOM and OACSIM. DPTMS, through the ITAM Coordinator also shares geospatial data with EMD and the IGI&S Manager to ensure all are up to date on Range and Training Area boundaries as well as environmental constraints.

B. Conservation Law Enforcement

Conservation Law Enforcement Officers (CLEOs) must have accreditation through the U.S. Army Military Police School (USAMPS) and the IMCOM PMO CLEO Certification Course, at a minimum, unless they have attended Land Management Police Training at the Federal Law Enforcement Training Center. CLEO training implies a working knowledge of federal fish and wildlife and cultural resource laws to include, but not limited to: Sikes Act, Migratory Bird Treaty Act, Endangered Species Act, Lacey Act,

Bald and Golden Eagle Protection Act, Archeological Resources Protection Act and appropriate State Fish and Game Regulations.

Enforcement of conservation laws is aimed primarily at protecting the wildlife and other natural and cultural resources as an integral part of the Installation's Conservation Program. Examples include upholding the hunting and fishing laws, monitoring archeological sites and policing activities around wetlands, forests, and sensitive natural areas. Familiarity with the Installation's Integrated Natural Resource Management Plan (INRMP) and Integrated Cultural Resource Management Plan (ICRMP) is important in understanding the priorities of the Conservation Program and where enforcement actions are in greatest demand.

The Provost Marshal is the senior law enforcement official. The Chief of Police supervises the Conservation Enforcement program. They also receive technical direction from the DPW, Environmental Management Division Conservation staff in accordance with Army Regulation 200-3. Per DoDI 5525.17, the CLEO may be co-located with the Conservation Program Manager. Fort Lee has exclusive jurisdiction regarding enforcement of conservation laws. Enforcement is performed only by the Fort Lee CLEO, or if necessary, with assistance from a USFWS agent. Actions taken by USFWS or Fort Lee are adjudicated by the Federal Magistrate.

The Conservation Law Enforcement Officer (CLEO) is often the face of the Conservation Program. It is the person most associated with wildlife and conservation measures through the use of a marked vehicle combined with time spent in the field. The CLEO fields questions routinely on hunting laws, wildlife identification, volunteer opportunities, etc. They develop relationships with conservation stakeholders both within and outside the installation, and work to connect interested parties with the appropriate conservation SMEs. The CLEO assists in hosting conservation events, generating conservation media, and ensuring that the interested public has a positive experience with any wildlife or outdoor recreation opportunities that they might engage in.

In a more traditional law enforcement vein, the CLEO also works to safeguard installation resources. They investigate theft, trespass, and poaching actions. Timber and cultural resources are real property and the responsibility of Fort Lee. The theft of wood products or poaching of cultural artifacts or wildlife is a serious crime. Likewise the Conservation Officer is always on the alert for trespassers, and uses multiple means from security cameras to active surveillance to thwart criminal activity. As part of the Fort Lee Police Force, the CLEO receives primary training from FLETC.

Fort Lee currently has one Conservation Law Enforcement officer. The individual is well versed in state fish and wildlife laws and has shown effective

engagement with the public both on and off the Installation, engaging in education and outreach with local, state, and federal partners. The current CLEO has recently received conservation law enforcement training through the IMCOM PMO CLEO Certification Course and is current in his working knowledge of natural resource laws and regulations.

C. Grounds Maintenance

Fort Lee maintains a multi-year contract with contractors to handle operational maintenance and repair of infrastructure and grounds. Among many other things these include grass cutting and landscaping. Fort Lee requires all landscaping to include native species wherever possible. This is especially true for trees and shrubs but the Installation allows latitude on flowers and ground cover plants. Mowing includes all grassed areas in the cantonment plus the large grasslands that cover landfills and the 120+ acre aerial delivery training area. Historically, these latter areas were mowed four to six times a year, or whenever requested. In 2012, the natural resource manager reviewed the contract specifications for the new contract and had the mowing frequency changed to twice per year for landfills and the aerial delivery area, once in late winter and once in late summer. This has allowed grassland birds to successfully breed and raise young in these large grasslands without the threat of mowing.

D. Soils, Erosion, and Sedimentation

1. Soils

Fort Lee encompasses 19 soil series, many of which are present in only small areas on the installation (USACE 1993). Three series appear in consistently large or numerous areas throughout the soil maps:

- Slagle: The soils in the Slagle series are deep and moderately well drained. They were formed in loamy fluvial and marine sediments and are found on uplands and on side slopes of narrow drainage ways. Slopes range from 0% to 15%.

- Emporia: The soils in the Emporia series are deep and well drained. They were formed in stratified loamy and clayey fluvial and marine sediments. Emporia soils are on uplands and side slopes adjacent to drainage ways. On Fort Lee, most soils in these series are found on 2% to 6% slopes, although there are a few isolated areas with 6% to 10% slopes and 15% to 45% slopes.

- Kinston: The soils of the Kinston series are deep and poorly drained. They formed in loamy fluvial sediments. These soils are found on flood plains. On Fort Lee, they are found predominantly in Blackwater Swamp and along Bailey and Cabin Creeks. Slopes range from 0% to 2%. These soils comprise much of the developable land on Fort Lee and have resulted in a need for nutrient credits on occasion where infiltration was not adequate to address stormwater management requirements.

2. Sediment and Erosion Control

Fort Lee has a close relationship with DEQ and this results in a simple hierarchy toward implementing appropriate stormwater management strategies. For ground disturbance less than 10,000 sq. ft. the proponent is expected to exercise good judgement in minimizing run-off and stabilizing the site as quickly as possible, with no plans or permits required. Fort Lee has a stormwater engineer that polices construction sites and notifies contractors of inadequate site management, as part of its responsibility under its MS4 permit (referenced below). For ground disturbance that exceeds 10,000 sq. ft. but is less than one acre, the project requires an erosion and sediment control plan. Fort Lee reviews and approves these plans, but there is no permit required from DEQ. For projects equaling or exceeding one acre, a stormwater pollution prevention plan (SWPPP) is required as part of a Virginia Stormwater Management Permit (VSMP). The DEQ approves the permit and is the regulator. They reserve the right to visit the installation and do site inspections and issue corrective actions if needed. Fort Lee reviews the plans when they are submitted to DEQ and may provide guidance to the contractor on making corrections or improvements.

The installation has several permits through DEQ: small Municipal Separate Storm Sewer System (MS4) Permit, Industrial General Stormwater permit, and Virginia Pollutant Discharge Elimination System (VPDES) Permit. Through the City of Hopewell it also holds an Industrial Wastewater Permit.

Fort Lee was fortunate to be the first installation to be awarded funding toward stormwater retrofits to meet EPA Total Maximum Daily Load (TMDL) standards in 2015. The installation received just over $3M from AEC to design and install LID stormwater retrofits for six highly impermeable areas. Design oversight for the effort was provided by the Baltimore District Army Corps of Engineers. The intent behind the funding was to meet target reductions for nitrogen, phosphorus and total suspended solids to a level compatible with EPA goals for 2023. Analysis of the installed projects determined that EPA goals would be exceeded for phosphorous and total suspended solids and only slightly deficient for nitrogen. Concurrent with the completion of this project, Fort Lee was also just completing a Nutrient Management Plan which should further promote nitrogen reduction strategies installation wide.

E. Water Resources

1. Coastal & Marine Resources

Fort Lee harbors coastal and marine resources in only one location: TA-28, the water training site on the Appomattox River. The Appomattox River is a tributary to the James River and the location of TA-28 is approximately 4 miles from the confluence. The installation owns a 4-acre tract on the bank of the Appomattox sandwiched between private land and Department of Corrections property. Approximately 300 linear feet of that four acres is waterfront. The shoreline there experiences an approximately 3 ft tide range, and places a premium on the training units ability to stabilize the shoreline enough to operate their equipment safely and without loss or damage to equipment. The exacerbating factor is barge traffic that generates huge wakes along this section of river. The Quartermaster School's Petroleum and Water Division, which oversees this site, contracted to have a dock constructed at the site to afford training access through all tide cycles and reduce impact from barge traffic. The dock was completed in the summer of 2019.

2. Virginia Coastal Zone Management Program

The Virginia CZM program is an oversight program administered by DEQ that requires that all activities within the state's "Coastal Zone" adhere to the laws and regulations of the state resource and regulatory agencies. DEQ serves as the coordinator for the state response on reviewable actions. Because Fort Lee is within the coastal zone, Virginia is authorized to require that federal actions that affect any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of the state's approved Coastal Zone Management Program before they can occur. This is done through submission of a Federal Consistency Determination Package to DEQ which describes the federal action and how it intends to meet the regulatory requirements of the state's coastal zone program. This process normally occurs concurrently with the NEPA process. DEQ has up to 60 days to review the package and issue the state's comments, but may request up to an additional 15 days if needed.

F. Wetlands

The Installation has approximately 511 acres of jurisdictional wetlands. All are non-tidal, and some are isolated, but most of the wetlands are forested wetlands associated with stream channels and river headwaters. There are three main areas of

the Post that harbor the bulk of the wetlands. First is the Blackwater Swamp which forms the southern boundary of the Installation and forms the headwaters of the Blackwater River, a more southerly watershed that ultimately feeds the Albemarle Sound in North Carolina. It is dominated by tupelo and black gum trees typical of southern swamps. The wetlands there run the gamut from forested to scrub/shrub to emergent, with forested being most dominant. Second is Bailey Creek, a drainage of the James River, that essentially bisects the Cantonment area of Fort Lee with its headwaters starting at the southwestern edge of the Installation. Wetlands are mostly riparian in nature associated with forested intermittent stream channels and drainages that feed Bailey Creek. And third is the 2,200-acre Range Complex which is predominantly forested and dominated by numerous dendritic wetland drainages that eventually coalesce into two or three discreet stream channels. This area was historically part of a large swamp system. Among the existing drainages now are many isolated wetlands left over from various efforts to drain the area back during the early to mid-1900s.

The Installation extends maximum protection to wetlands. Fort Lee follows the Chesapeake Bay Protection Act guidelines of 100 foot buffer, or Resource Protection Area (RPA), from all perennial wetland boundaries. Where actions result in conversion of riparian habitats to impervious surfaces the Installation sets a pro-rated mitigation fee of $2,500 per acre for lost RPA. These funds are then used to purchase additional trees for riparian habitat restoration.

G. Floodplains

Despite being located at the confluence of two rivers, with multiple primary creeks and over 500 acres of wetlands, Fort Lee has virtually no property within the 100 or 500 year floodplains (FEMA 2012). Topography on Fort Lee ranges from approximately sea level to over 160 feet. There are four Petroleum and Water Division Training Sites on Fort Lee but only one is on tidal water, the Appomattox River. The tide range at this site is approximately 3 feet. The nearest structure to water is approximately 12 feet above mean high water (MHW), with the nearest classroom or occupied space at approximately 20 feet above MHW. Two of the remaining Water Training Sites are on a tributary creek to the James River, but they are well above the tide zone, with all structures located at least 60 feet above sea level. Risk to these sites would come from localized, extreme rain events rather than tidal inundation. Although Fort Lee is surrounded by floodplain areas it is not subject to be directly affected by extreme flood events of historical magnitude.

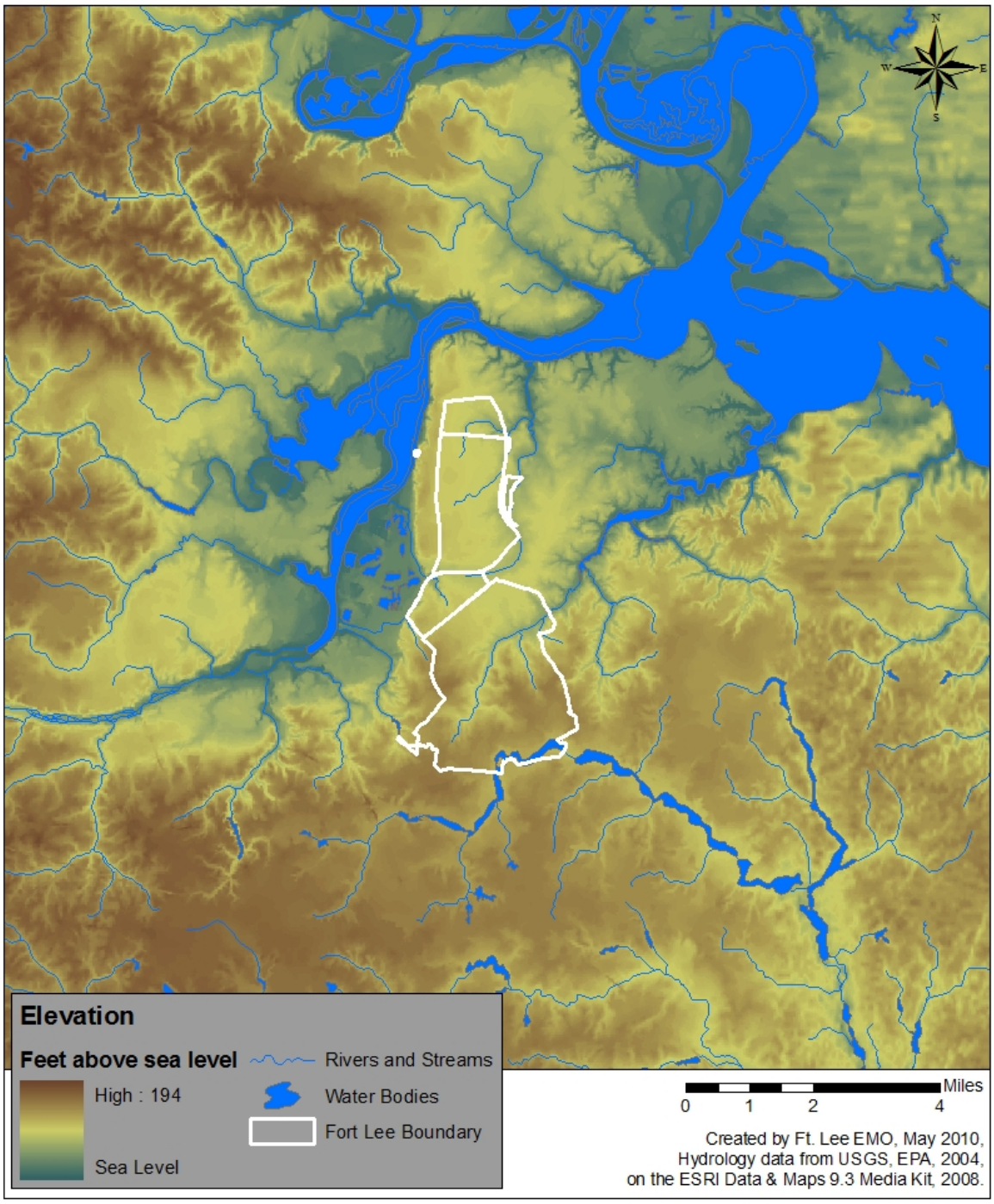

Figure 4. General elevation of Fort Lee and relations to sea level.

H. Forest Management

Vegetated communities at Fort Lee are typical of those found in the inner Coastal Plain, where hardwood oak-hickory forests are often interspersed with mixed pine and pine dominated communities. Successional habitats are also common, where the oak-hickory unit has been replaced by maple-gum-tulip or regenerative pine stands. In pine communities, loblolly pine (*Pinus taeda*) is the dominant conifer and can form dense monotypic stands with low species diversity. When loblolly is mixed with oak-hickory assemblages, species diversity typically increases and understory conditions are well developed with distinct sapling, shrub, and herbaceous layers.

Fort Lee had a forest inventory completed in 2015 (RMA 2015). Each of 66 identified forest compartments were mapped and catalogued using a full suite of silvicultural and forest health parameters. For the sub-canopy inventory, herbaceous ground cover was identified to the species level and abundance was estimated using percent cover. All shrubs and saplings were also identified to species level, but abundance was assessed using stem density. Invasive species were recorded in order to provide a quantitative estimate of invasive plant species coverage within each compartment.

Within the 66 sampling compartments, approximately 32 species were sampled from the herbaceous layer, including 3 invasive species, and 46 species from the shrub/sapling layer, which included 5 invasive species. The canopy layer included 16 species, with only 1 invasive species, the tree-of-heaven (*Ailanthus altissima*). The Forest Inventory and Vegetative Assessment (Resource Management Inc. 2015) that came out of this developed management recommendations for each forest compartment, and prescriptive measures for invasive species control. These recommendations are the basis for ongoing forestry funding requests. Foremost among these is the need for continued invasive species management. We hope to eradicate the canopy invasive species by 2022 and then concentrate on the shrub and understory species. Timber stand improvement (TSI) through mast tree selection will be a second tier priority for this INRMP. The white-tailed deer population is struggling for forage opportunities with the loss of over 500 acres of old growth hardwoods in the last ten years, so there is a need to improve the health of existing forests for mast production. These TSI efforts also provide the extra benefit of improving forest access for training and supplementing components of the RCMP.

One issue that has come to the forefront in the last two years has been a dramatic resurgence in pine beetle activity. A drought in late summer 2019 followed by a mild winter seems to have exacerbated the recent emergence. Over half of Fort Lee's forest stands within the Cantonment are impacted by active pine beetle activity. What

was originally more of an aesthetic issue is rapidly becoming a safety issue and ecological problem. Impacts span multiple acres in several Training Areas that themselves are less than fifty acres. This has quickly become priority one for forest management and will be a critical component of forestry funding requests for the foreseeable future.

1. Invasive Species Management

Because of the small size and the high level of activity across the installation, Fort Lee is particularly susceptible to colonization by invasive species. The largest contiguous block of forest with no interruptions is no more than a hundred acres, which is very small by forest management standards. The intrusion of firebreaks and ditches opens a doorway for numerous aggressive plants to flourish. Foremost among them is *Microstegium vimenum*, or Japanese stiltgrass as it is commonly called. Stiltgrass now makes up approximately 30% of the groundcover within the forested areas on Fort Lee. Its ability to survive in almost any moisture regime, pH, or light regime and the fact that it is a prolific seed disperser makes it essentially impossible to eradicate. Because it is very shallow rooted and it responds well to glyphosate, it is easy to control in targeted areas, but once it drops seed, the seed may remain viable for several years. It can become expensive to control in both time and money once it colonizes an area. As a result, Fort Lee does not target *Microstegium* for control efforts unless it threatens sensitive ecological areas.

Of recent interest has been the invasion of Phragmites, or common reed on Fort Lee. It has emerged around multiple stormwater BMPs, having an affinity for wetland sites. It generates a dense stand of thick-stemmed reeds that outcompete other wetland plants, and provide little in forage or shelter to wildlife. Phragmites was first detected in 2017 at four locations. Before it could be treated, the grounds maintenance contractor had conducted a mowing of those sites which transferred the seeds to fifteen other locations. Aggressive treatment for the last two years, has reduced its footprint to just five or six sites, and the installation hopes to eradicate it within the next two years.

The core of the invasive species funding goes to two species: Chinese privet, and tree of heaven. These two species often grow side by side and can form dense monotypic stands that both diminish wildlife value and compromise the ability for Soldiers to train. Treatment has involved herbicidal applications followed by mechanical removal of the dead plants. Some of the treated areas have resulted in newly cleared sites large enough to provide additional training areas.

Table 1 below presents a list of the primary invasive species that occur on Fort Lee (RMA 2015). Each year, there is a request for funding to try to control the spread of

invasives in at least one or two areas. All of the forested areas on Fort Lee have been mapped and assigned a value based on the percentage of invasive species cover within each forest stand. The Installation's Forest Management Plan provides an overview of priorities and management techniques necessary to most effectively treat each species. It will continue to be important to secure as much funding as possible each year to try to stay ahead of the invasive species impacts. This will become increasingly difficult however as the installation is under growing pressure to make maximum use of its open lands for training, which in itself can be a significant driver for the spread of invasive species.

Table 1. INVASIVE SPECIES of FORT LEE

Species	Prevalence	Risk
Chinese Privet	Mostly in northern area of Range	Highly Invasive
Chinese Lespedeza	Common along fields, wetland borders	Highly Invasive
Autumn Olive	Localized, mostly at the Range	Highly Invasive
Tree-of-heaven	Pervasive; field edges, roads, woods.	Highly Invasive
Multiflora rose	Forest edges, roadsides, streambanks	Highly Invasive
Japanese stiltgrass	Pervasive throughout all forested areas	Highly Invasive
Japanese honeysuckle	Widespread in forest, edges, roads.	Highly Invasive
Phragmites	Wetland margins	Highly Invasive
Wintercreeper	Forest margins, openings.	Moderately Invasive
Tatarian honeysuckle	Forest edges, roadsides, openings.	Moderately Invasive
Common chickweed	Common in fields, disturbed areas.	Moderately Invasive
Norway maple	Urban woodlots, forest fragments	Moderately Invasive

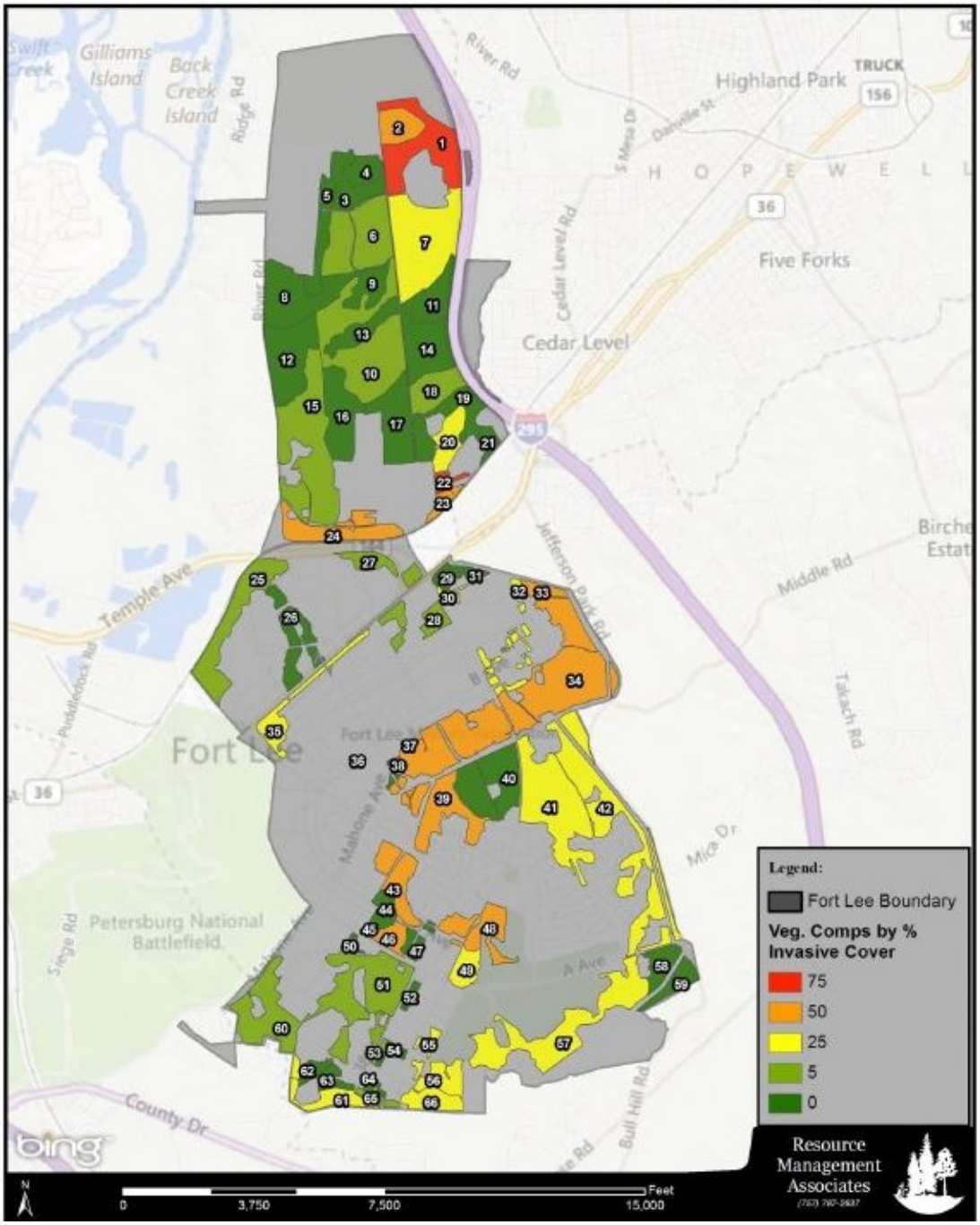

Figure 5. Invasive Species Coverage by Forest Compartment

2. Wildland Fire Management

Management of wildland fire on Fort Lee is normally tied to two circumstances; one reactive and one proactive. With the extension of the primary small arms range out to 800 meters, there is substantial grass cover susceptible to tracer fire whenever conditions are right. In 2017 there were at least three tracer-caused fires on the range, one of which consumed several acres of adjacent forest. This is a reactive use of wildland fire management. When these events transpire, there is a chain of events that follow that may include Range Operations, the Fire Department and even local assistance through mutual aid agreements. The installation has a signed Wildland Fire Management Plan which lays out the protocols and expectations for all parties in the event of a wildfire (EMD 2014).

Likewise, the IWFMP is very prescriptive for actions required when a prescribed burn is conducted on the installation. The NRM conducts prescribed burns periodically, subject to availability of funding. The burns serve multiple purposes. One benefit is the reduction in existing fuel load, which minimizes the risk to the forest from errant tracer rounds. Another benefit is the thinning of undesirable tree and shrub species for a healthier forest, and finally, prescribed burns can help to release the seed banks of native herbaceous plants which boosts biodiversity and provides valuable habitat for wildlife.

Foremost among the prescribed burn protocols is a Smoke Management Plan. The Fort Lee range complex is surrounded by one interstate and two state roads. Two residential housing complexes are immediately adjacent. There are very few days each spring when the atmospheric conditions permit the use of prescribed fire that would not jeopardize the air quality for residents or the safety of drivers on the interstate. Of equal importance is the notification chain for a prescribed burn. It must be vetted through the command line to the Garrison Commander, routed through PAO, and the local municipalities notified. The Fort Lee Fire Chief is the Installation Wildland Fire Program Manager, and in the case of prescribed fire, serves as the incident commander and bears the ultimate responsibility for the go or no-go scenario.

On Fort Lee prescribed burns are planned and scheduled by the NRM, executed by a private contractor, and overseen by the Fire Department. There have only been two burns in the last ten years. Both were conducted to reduce fuel loads, with a secondary benefit of improving training access. Fort Lee has also seen improvement in native herbaceous species restoration associated with burn sites. Burns never exceed 100 acres.

Wildland fire management is about understanding lines of communication, knowing equipment and manpower capabilities, and maintaining readiness. The Fort Lee Wildland Fire Management Plan has been used as a model by other installations. It was last updated in 2014, and is currently under review for revision.

I. Recreation

The recreational needs of the installation are managed by the Family, Morale, Welfare, and Recreation (FMWR) Directorate. They offer a comprehensive suite of year-round activities to include: winter sports, water sports, shooting sports (to include hunting), and maintain a bowling alley, dog park, and several fitness centers. FMWR is one of the primary sponsors of the Fort Lee hunting program. They generate and sell the permits, oversee the weapons qualifications events, maintain hunting stands, provide safety briefs, maintain the log books, and provide game processing facilities and freezer space. In accordance with AR 215-1, FMWR provides 90% of the base price for each hunting permit back to the DPW for wildlife conservation needs. FMWR may add additional fees to the base price to cover various amenities that they provide to hunters, such as tree stands, a game skinning shed, and freezer. They have a voting seat on the Hunting Council.

J. Game Management

Game species on Fort Lee include primarily whitetail deer and turkeys. There is very little interest or demand for small-game hunting. Deer and turkey hunting is carried out through an organized program managed by the FMWR Directorate. One of the most problematic issues for deer management on Fort Lee has been the perimeter fence. It was installed after 9-11 and completely encloses the cantonment area, with the exception of the extreme southern boundary where the Blackwater Swamp occurs. The perimeter fence has vertical bars that are too close together for deer to pass through. On the southern boundary, deer historically were able to traverse the swamp in dry years but beavers have now backed up the water year-round to where it is impassable. The only other point of egress was a large box culvert under a state road where Bailey Creek exits the installation. In 2017, this culvert was fenced as a security precaution. Now, the installation is completed sealed to deer. Compounding the problem of mobility, the installation lost over 200 acres of mature timber, mostly mast-producing hardwoods, since the fence was installed. Forage resources are becoming problematic. Deer are starting to look less healthy, often with patches of fur missing, and many bucks with abnormal antler development. The initial response was to promote an aggressive hunting program to reduce the deer population to carrying

capacity. After two years of extended seasons and high harvests, the herd was dramatically reduced.

Concurrently with herd reduction was the arrival of coyotes on post. As of 2018 there was evidence suggesting that coyotes were taking a toll on the fawn population. This was deduced from two years of harvest data that showed an inordinate number of older deer being harvested, and a paucity of yearlings. A coyote control program was initiated in 2018 resulting in the removal of two female coyotes. This was discontinued in 2019. So far, we have detected no evidence of coyotes breeding within the cantonment. This balance between predation risk, hunter success, and deer demographics is the new state of affairs. The period of this INRMP will allow Fort Lee to refine their harvest limits and predator removal strategies to reach a sustainable deer management goal.

Deer management objectives are primarily associated with the cantonment area. The range complex has its own deer population on 1,600 acres to the north that is unencumbered by fences. It is surrounded by a matrix of residential and agricultural land and an interstate. The need for an aggressive management strategy is not necessary for this population because they are free ranging and the available habitat is suitable for deer. Harvest strategies focus on attempting to grow larger bucks by overlooking young bucks. There does not appear to be an observable browse line in the forest and all animals look healthy. There is an active effort to observe and document any anomalies in deer at either component of the installation. Only once has a serious issue been documented for deer. Fort Lee had one documented incident of hemorrhagic disease in 2015, a young buck taken during archery season.

Wild turkeys are the only other regularly hunted game species. There is a small, but persistent turkey population that has dwindled due to the reduction in forage areas from the loss of mast trees to construction. Less than a dozen hunters hunt turkey on Fort Lee. An abundance of meso-predators combined with multiple wetter than average springs continue to work against a rebound in turkeys. There is an effort to selectively restore mast trees and increase the acreage of productive grassland and shrubland. The installation is hoping this will assist with increases in both turkey and quail.

There is no trapping on Fort Lee, except as conducted for specific goals as directed by the NRM, using in-house staff.

1. The Hunting Program

Hunting on any installation takes place at the discretion of the Garrison Commander. On Fort Lee, there is a Hunting Council chaired by the DPTMS Director and comprised of a voting member from each of the participating Directorates: DPW,

FMWR, Safety, DPTMS, and PMO plus a voting representative from the hunting community (Fort Lee 2016). The Council meets three times a year: once before, once during, and once after the hunting season. The NRM develops and maintains the installation's Hunting Policy, with review and contributions from the Hunting Council. The policy is signed by the Garrison Commander.

DPW is the primary proponent for the hunting program, as a tool for wildlife management. The Environmental Management Division (EMD) is the DPW Division that participates on the Hunting Council. The Natural Resource Manager (NRM) is the voting member and prepares the agendas and minutes for the Hunting Council meetings. The NRM requests all hunting dates in RFMSS and coordinates closely with DPTMS and FMWR as mission requirements and schedules change during the season.

FMWR manages the administrative components of the Hunting Program. They maintain a log cabin that serves as the Outdoor Recreation headquarters. They sell permits there, hold safety briefs, construct and maintain hunting stands, and maintain the log books for both harvest data and hunter effort. Ninety percent of the base fee for permits goes back to DPW through a special Wildlife Conservation Fund. These funds are used as needed for wildlife management. Fort Lee has an average of about a hundred hunters per year. Each season hunters have to qualify on each weapon, purchase a permit and attend a safety brief before they can hunt. Hunting occurs in almost all wooded areas on post. Areas near development are designated archery only; areas away from development are eligible for multiple weapon types. This role by FMWR may change within the next year. EMD has contracted with the vendor for the iSportman software that has just gone live in October 2020. This software may remove the need for personnel to conduct license sales, maintain logbooks, and produce hunting maps. The most significant benefit already is the increase in safety as stand selection and hunter location will not be as prone to human error.

The Safety office prepares a risk assessment each year if there any changes to the Hunting Policy or the execution of hunting procedures. They inspect each hunting stand annually to ensure its safety and adequate separation from buildings and roads. They evaluate all new stands to ensure they meet the same criteria.

DPTMS is responsible for the ranges and training areas and scheduling the use of those facilities. Most of the hunting takes place within Training Areas and so must compete with mission requirements for eligibility. It is imperative that Range Operations staff and FMWR and DPW staff communicate effectively to ensure no overlap in land use. Fort Lee benefits from a very good rapport between Range Operations and the Environmental staff.

PMO is represented by the Game Warden. Fort Lee has one Game Warden that works the hunting program during season, and polices archeological sites during the off-season, as well as assists with normal police duties.

Because of the small size of the Installation and the large number of prospective hunters, the hunting program is not advertised to civilians outside the installation. Non-CAC card holding civilians are eligible to hunt, but they must have a Fort Lee hunter sponsor, must register their weapon, and qualify with their weapon, and must pay a higher fee than CAC-card holding hunters. Most off-post civilians are not willing to accommodate these requirements given the many public lands available to hunt in Virginia. Fort Lee does maintain at least one mobility-challenged hunting stand to accommodate hunters with disabilities. The fee for hunting on Fort Lee is $150. The base permit fee is $40 with an associated $110 recreation fee to support part-time staff and facilities maintenance. Of that $40, $36 comes back to DPW for wildlife management.

2. Fisheries Management

Fort Lee does not typically conduct fisheries management projects. There are two sources for fisheries on the installation: Blackwater Swamp and Bailey Creek. Blackwater Swamp is the headwaters for the Blackwater River and harbors most of the full suite of riverine freshwater fish. It was thought to possibly harbor the endangered black-banded sunfish, but that fish has only been documented further down in a lower reach of the river. The Swamp does receive run-off from the golf course however, and historically that was damaging to the health of that system. More recently the Golf Course has greatly minimized it use of herbicides and fertilizers, even to the point of converting its greens to ones that need less water and nutrients. Water quality appears to be improving in the Blackwater Swamp. Fort Lee intends to sample this waterway the next time the Bailey Creek system is evaluated.

Bailey Creek has several different minnows and larval fish, but only a fraction of what should be expected on a healthy creek of its magnitude. This was based on 2013 benthic macro-invertebrate surveys (VDCR 2013). For years it appeared on the State's list of impaired waters, for fecal coliform. Fort Lee has instituted several projects to improve water quality, particularly within the Bailey Creek watershed. These include stormwater retrofits, and BMPs with more emphasis on infiltration than detention. This would likely result in a more pronounced improvement in aquatic life than anything that would be done specifically for fisheries management. Aquatic sampling to evaluate the health of this system, to include the fisheries, is planned again for 2022.

Recreational fishing is prohibited on Fort Lee, with the exception of the retention ponds on Ordnance Campus with permission from the Game Warden. The

Golf Course ponds, Bailey Creek, and other stormwater BMPs are not eligible for fishing. There are no opportunities for public fishing on Fort Lee, and no public access to the Appomattox River.

K. Non-game Management

The management of nongame species on a military installation is less an end in itself than a product of overall habitat stewardship. There is typically no budget for nongame species unless their rarity affords them significance not yet realized by a "listed" status. An example on Fort Lee is the spotted turtle. Spotted turtle is a species that has been petitioned for listing by the Center for Biological Diversity (CBC 2012) with a decision by the USFWS to be made in 2023. (USFWS 2017). It would be possible to get funding to investigate the status of a candidate species like the spotted turtle, particularly one that exists within the footprint of active training areas.

Other nongame taxa include small mammals, other reptiles and amphibians, migratory birds, insects, and numerous aquatic species. All are indicators of habitat quality to some extent, and each is subject to benefit from habitat management that conserves the most diverse and largest blocks of habitat available. There is a concern that coyotes are impacting the densities of our nongame populations. Where once rabbits, skunks, and foxes were extremely common year round, they are uncommon to rare now. Rabbits have all but disappeared, skunks are rare, and foxes are much less common. Bobwhite quail and turkey are rare as well, however there scarcity is likely related more to habitat loss and poor breeding conditions than predation.

The initiation of a coyote management program is a natural extension of normal game management. It will be important not just for assisting with deer population management, but for maintaining diversity of many nongame species.

1. Migratory Birds

The Migratory Bird Treaty Act (MBTA) – The MBTA (15 USC 703 et seq.) of 1812 is a federal statute that implements treaties with the U.S. and Canada, Mexico, Japan and Russia on the conservation and protection of migratory birds. The MBTA states that it is illegal to pursue, hunt, take, capture, kill, or sell any "migratory" birds or any of their parts (e.g., feathers, eggs, nests) alive or dead, as defined by regulation. The regulatory definition of "migratory bird" is very broad and includes most native birds found in the U.S., even those that do not migrate.

DoD Migratory Bird Readiness Rule (50 CFR Part 21) – Section 315 of the 2003 National Defense Authorization Act and the Military Readiness Rule (50 CFR Part 21)

implementing Section 315 authorize, with certain limitations, the incidental take of migratory birds during military readiness activities. Under the Migratory Bird Readiness Rule, installations must identify and consider ways to minimize or mitigate the take of migratory birds during *all* military readiness activities. For military readiness activities that are not expected to have a significant adverse effect on a population of migratory birds, an installation need only identify and consider ways to minimize or mitigate the take of migratory birds, typically through prescriptions in its INRMP, or project-specific NEPA document. Installations are not obligated to implement any measures that would diminish the effectiveness of the military readiness activities under consideration. On the other hand, for military readiness activities that may have a significant adverse effect at the population level, an installation must confer with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate any significant adverse effects.

The Migratory Bird Readiness Rule states that when conservation measures are implemented and require monitoring, the Armed Forces must retain records of any monitoring data and report it to the USFWS during the annual INRMP review, along with migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds. In terms of complying with the "Readiness Rule" there are no species that Fort Lee is subject to impact at the population level due to the extremely small size of the installation's footprint and by extension, its habitats. Even at the individual organism level Fort Lee takes stringent precautions against habitat loss during breeding season. Timber harvests and ITAM vegetation control efforts are precluded between 1 April and 31 October in response to migratory birds as well as bat activity periods. Large grassland areas are only mowed twice each year; once in March and once in August to minimize impacts to ground-nesting birds. And prescribed burns are only conducted in late winter, from 1 February to 31 March.

Executive Order (EO) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, and DoD-USFWS Memoranda of Understanding (MOUs). - On July 31, 2006, DoD and the USFWS entered into a MOU to promote the conservation of migratory birds, in accordance with EO 13186. The MOU did not address or authorize the take of migratory birds. Instead, it identified activities where cooperation between DoD and the USFWS will contribute substantially to the conservation of migratory birds and their habitats. The updated MOU of 2014 between DoD and the USFWS describes specific actions that DoD should take to advance migratory bird conservation, reasonably avoid or minimize the take of migratory birds, and ensure that DoD activities (excluding military readiness) comply with the MBTA in ways that are "consistent with imperatives of safety and security." In addition, Armed Forces must ensure that its operations are consistent with the MBTA and, in ways that help sustain the use of

military managed lands and airspace for testing, training, and operations, should avoid or minimize the take of migratory birds and advance migratory bird conservation through its natural resource management activities.

In December 2017, the Department of the Interior's Solicitor's Office issued a new opinion on MBTA which concluded "that the MBTA's prohibition on pursuing, hunting, taking, capturing, killing, attempting to do the same applies only to direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control". This has been roundly criticized by the scientific and conservation communities, and has not been embraced by other federal agencies. The Deputy Assistant Secretary of Defense (Environment, Safety, and Occupational Health) issued a rebuttal in February 2018 noting that this new Solicitor's opinion "does not rescind the "Military Readiness Rule", or the resulting MOU with the USFWS". Nor does it address a split among the decisions of five Circuit Courts of Appeal that addressed whether the MBTA criminalizes some instances of incidental take; an issue that can only be resolved by the U.S. Supreme Court or by Congress. The full text of all of these opinions in addition to a final interpretation by the USFWS including a FAQ attachment to address most likely scenarios is provided in Appendix A.

On 8 June, 2020, the U.S. Fish and Wildlife Service (Service) published a draft Environmental Impact Statement as part of the National Environmental Policy Act process as it relates to the scope of the Migratory Bird Treaty Act. This action is related to the 2017 Department of Interior Solicitor's Opinion M–37050, which restricted the legal scope of the Migratory Bird Treaty Act to intentional take of migratory birds. This draft Environmental Impact Statement opened a 45-day public comment period that closed on July 20, 2020.

For additional easy reference, the EPA's posting of the draft EIS can be found here: https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=297321

More information related to this proposed rule, scoping and other associated materials, can be found online at https://www.fws.gov/regulations/mbta/

2. Partners in Flight (PIF)

The PIF movement began in 1990 following an international meeting in Atlanta, GA in December of 1989 referred to as the NeoTropical Migratory Bird Conservation Conference. Partners in Flight was adopted as the more practical name and first took shape at the state level. Virginia was one of the first states to start a PIF program in order to network agencies and NGOs toward adopting habitat conservation measures for migratory birds. Ultimately, a national PIF group emerged and then later biologists

within DoD formed their own group, which has been one of the most successful and productive of the PIF efforts. DoD PIF puts out an Annual Report each year which details efforts across the country that installations are doing to conserve bird habitat while at the same time accommodating training and range needs. They have a Strategic Plan, a website on DENIX, and a list-serve for maintaining contacts and updating as new information emerges.

More recently, DoD PIF developed a list referred to as DoD PIF Mission Sensitive Priority Bird Species (see Appendix B). For these species, the impact on the mission is the greatest weighted factor. Focusing on such species would not only prepare military installations in the event such species are listed in the future, but implementing conservation efforts could help preclude such species from being listed. This would support DoD's commitments to migratory birds per EO 13186 and associated MOU, and would greatly minimize any chance for a military readiness activity to have a significant adverse impact on a population of migratory bird species. The mission-sensitive species are probably the most vulnerable to the DoD-MBTA rule. Fort Lee has one species from the Mission-Sensitive Species list, and five species from the Watch List of species (Appendix X). Northern bobwhite is the one mission-sensitive species. That species is only rarely seen or heard on Fort Lee, and is only currently known from one area at the north end of the range complex. A survey in 2021 will be conducted to ascertain its continued presence.

Watch List species include Red-headed Woodpecker and Prothonotary Warbler, two species that are relatively common on Fort Lee due to the Blackwater Swamp which contains preferred habitat for both. By virtue of their habitat, both are also protected from all current or projected military activities. The Grasshopper Sparrow occurs in open grasslands and once had one of the highest densities in the mid-Atlantic region on TA-17, the Drop Zone. The species still occurs there in relative high numbers but not what it once was. Prairie Warbler has all but disappeared from Fort Lee as the last vestiges of early successional habitat have aged out of use and are now too mature to harbor this species. Efforts are underway to try to restore some early successional habitat. Still a relatively common species, the Wood Thrush is rapidly disappearing. As a ground forager, Wood Thrush habitat is being displaced by *Microstegium vimenum* at an alarming rate. This is happening both at Fort Lee and Petersburg Battlefield National Park such that Wood Thrush is no longer a truly common species, and is dwindling in numbers annually. Kentucky Warbler is another migratory bird on the Watch List that once occurred on Fort Lee, but has been permanently extirpated from the Installation due to the spread of *Microstegium*. Likewise, Eastern Whip-poor-will and Loggerhead Shrike are species that once nested on Fort Lee as well, but are gone now due to habitat loss and overall species declines. Fort Lee is thought to have had the last nesting pair of Loggerhead Shrikes known to have nested in the Coastal Plain in 1997.

As regards management of migratory bird habitat, the NRM has focused funding on restoring natural grassland and shrub habitat. Specifically, a 54-acre abandoned field at the north end of the range complex was recently dominated by an invasive pear species. That has been eradicated, and the entire stand will be plowed under and reseeded in warm season grasses by 2022. The adjacent edges are being left fallow to restore shrub/scrub habitat to support declining shrub species. Intermixed with these will be wildflower habitats to support pollinators. Two such habitats were planted in 2018, comprising generic plants for pollinators in one plot with the second plot planted in milkweed to support Monarch butterflies.

Secondarily, the NRM has initiated regular thinning of pine stands to attempt to ultimately expand the habitat of brown-headed nuthatches through creation of more pine savanna type habitat. This species is now observed in all areas of the installation. It is thought that this is due to the loss of a principal habitat area to habitat destruction to support training. The species appears to be constantly exploring other habitats in search of future breeding sites. This species exists as a disjunct population at the northern extent of its range. Fort Lee has been thought of as the source population for brown-headed nuthatches that occur at the adjacent Petersburg National Battlefield Park. It is too early to tell how the reduction in nuthatch habitat on Fort Lee will affect the birds' status at PETE.

Fort Lee now hosts a breeding population of one new species: anhinga. Anhingas were first observed nesting in the Blackwater Swamp in 2018. Two nesting pairs were discovered along with additional non-nesting birds. This was initially thought to be the northern-most breeding record for the species, but shortly after another small colony was discovered in Charles City County, slightly further north. This species was once thought to be endemic to the extreme southeast, most common in southern Florida, but has been slowing trending northward over the last two decades. Follow-up surveys in 2019 yielded three nests and as many as eight adults in the area. Water levels made it difficult to survey in 2019. Preliminary surveys in 2020 have confirmed at least three nests again.

Interestingly, all anhinga nests found to date have not been high over the water. In some cases, only a few feet. Their locations have been more typical of green heron nests than great blue heron nests. Other nests in Virginia have been in abandoned great blue heron nests, typically in exposed, dead trees. The Fort Lee nests were in small, living tupelo trees easily concealed by the branches of the tree. This variability in nesting substrate will make it difficult to survey for this species in large forested wetland systems.

Finding this at Fort Lee was somewhat exceptional. At the time there were only three other locations known in Virginia and all were in extensive hardwood swamp

systems. They were all no more than a year old giving more credence to the fact that this species has only recently broken into Virginia and is likely still trending north.

3. Partners in Reptile and Amphibian Conservation (PARC)

PARC is a conservation network dedicated to the conservation of herpetofauna and their habitats. Its mission is to forge proactive partnerships to conserve reptiles, amphibians, and where they live. PARC is governed by a Joint National Steering Committee. It was a PARC-affiliated effort that helped to get Fort Lee included in a nationwide amphibian fungal survey. And PARC has provided assistance in survey methodology and identification of numerous species. They publish species profiles each month that have been useful as education and information tools. The spotted turtle species profile was readily accepted by our Range Operations office as an educational tool in the briefing slides to Soldiers training on the Range Complex, and was responsible for subsequent sightings of spotted turtles by Soldiers to the NRM.

PARC was a sponsor to a new study on fungal diseases in snakes that it launched in 2018. Specifically, the study was researching the presence of *Ophidiomycosis ophiodiicola*, a surface-borne fungus that poses a threat to snake population health and stability. Fort Lee was a participant in that study, along with 56 other DoD installations. The study involved collecting sample rubs along snakes' body surfaces using sterile cotton swabs, and preserving the samples on ice until shipping. The study was a good teaching tool for the use of sterile techniques in wildlife sampling, and yielded good information on the status and distribution of this fungal disease.

Fort Lee collected 29 snakes of eight different species, of which eight tested positive. This result helped to place Virginia in a category with Pennsylvania, Massachusetts, and Georgia as states with snakes at greater risk of *Ophidiomycosis* detection. Not enough is known about the prognosis for these snakes, but this study provided useful data on the extensive spread of the fungus. More work will be needed to better understand the implication of *Ophidiomycosis* detection.

4. State Wildlife Action Plan

The Department of Wildlife Resources developed Virginia's Wildlife Action Plan which recognizes the species and habitats in the state that are most in need of conservation, and tries to demonstrate practical actions that can be taken toward their stewardship (VDWR 2015). It was first developed in 2005 and heavily revised in 2015. Much of the revision was directed toward updating conservation priorities and reprioritizing conservation actions. Statewide, Virginia recognizes 883 species that are in decline, with habitat loss as the biggest driver. It has classified those species as

Species of Greatest Conservation Need (SGCN). Approximately 25% are already state or federally listed; nearly 60% are aquatic, and almost 70% are invertebrates. The Action Plan divides the state into 21 planning regions, roughly coinciding with the Planning District Commission boundaries. Through these regions, the state hopes to promote conservation measures at the local level and extend protections through habitat conservation and management that will have the greatest impacts on the most species. Of the 883 state species in decline statewide, the Crater Planning Region has a history of occupation by 106 of these species. Fort Lee, within the Crater Planning Region, has recorded 22 of these species. See Appendix C for details. Most of the SGCN at Fort Lee are birds; likely because they are most easily surveyed. Fort Lee has conducted two comprehensive reptile, amphibian, bird and mammals surveys in the last 15 years, but there are still numerous species that should occur on Fort Lee that have not been detected.

L. Sensitive Species

1. Threatened and Endangered Species

Fort Lee has recently identified two federally-listed species, the threatened northern long-eared bat (NLEB) and the endangered Indiana bat. The two species were recorded in an acoustic study conducted jointly by the Conservation Management Institute at Virginia Tech's Dept. of Fish and Wildlife Conservation and the USGS Virginia Cooperative Fish and Wildlife Research Unit at Blacksburg, Virginia. Fort Lee was one of several locations across southeastern Virginia where multiple acoustic detectors were stationed throughout the late fall and winter of 2017 and 2018. Fort Lee had three such detectors positioned along the margins of Blackwater Swamp. The two species were both detected with high degrees of confidence at one of the three detectors. Based on the period of detection and activity levels, the researchers felt that Indiana bats were likely using the area as a migratory habitat or winter refuge. Conversely, this southeastern population of northern long-eared bats was thought to initiate their maternity season in this part of the state, given their prolonged presence at these Coastal Plain sites into the spring. This may provide insight into a survival strategy of the NLEB allowing it to breed outside of the cave ecosystems up north that are more prone to white-nose syndrome.

The presence of the two species seems to be limited to the Blackwater Swamp, given the thermal advantage of these swamp ecosystems in winter. A comprehensive bat survey was conducted on Fort Lee in 2016 using stationary and mobile acoustic detectors, mist-netting, and structure examinations. No NLEBs were detected during the spring/summer activity season. In the fall of 2016 Fort Lee initiated informal consultation with the USFWS Gloucester Field Office relative to a pending timber

harvest of mixed older growth forest. Because the installation had just completed extensive acoustic and mist-netting surveys with no NLEB or Indiana bat detections, and was following all recommended conservation measures for NLEB the installation was eligible to rely on the Programmatic Biological Opinion on Final 4(d) rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions (USFWS 2016) to fulfill our project specific Section 7 responsibilities. Because of this we were able to submit a Self-Certification Letter as documentation of our adherence to the review process and acknowledgement of the tacit approval of the USFWS.

After evaluation of the Swamp habitat over time, it was determined that acres of forested wetland are being lost every year due to perennial flooding caused by beavers. Several acres of the original forested habitat have died and fallen over. The natural resource manager initiated a program in early 2018 to reduce beaver numbers and remove some of the more significant dams toward salvaging the remaining forested habitat. This will be a regular recurring event until some equilibrium is reached between the beavers and Fort Lee. The goal is to preserve the largest viable block of northern long-eared bat habitat. With protected habitat for NLEBs in the Blackwater Swamp, the installation is in the enviable position of being able to host and promote listed species at no risk to the military mission. The Blackwater Swamp is not used in any way for military training, and it has no public visitation.

Historically, Fort Lee has had only one other federally-listed species, the bald eagle. The last active eagle nest recorded on the installation was in 2003, after which it was abandoned (Fort Lee 2012). Shortly after, the species was delisted. There are still high-use bald eagle roost sites in close proximity to Fort Lee, so sightings are routine, but there are no restrictions to the sporadic air operations that occur with aerial delivery training. Although the installation is aware of continued protections under the Bald and Golden Eagle Protection Act.

There have been several state-listed species documented on Fort Lee. The state endangered Loggerhead shrike nested on the installation in 1997, and was observed regularly in 1998, but has not been observed since. This was thought to have been the last nesting pair in the Coastal Plain of Virginia. More recently, the 2016 bat survey documented both tri-colored bats and a Rafinesque's big-eared bat both of which are state endangered (ERG 2016). Fort Lee has extended the migratory bird conservation strategy of discouraging timber harvests between 1 April and 15 July. The timber harvest delay now extends through 31 October. This provides protection for both state and federal listed bats during the primary activity season. The NRM always surveys trees to be cut for any evidence of roosting bats. For the full list of federal and state listed species subject to occur on Fort Lee see Appendix D.

2. Candidate Species

Fort Lee has one species for which the US Fish and Wildlife Service has been petitioned for listing: the spotted turtle. This species has been experiencing precipitous declines in the last decade tied primarily to habitat degradation and collection for the pet trade (CBC 2015). Based on the number of sightings in recent years, it appears that there is a healthy population on Fort Lee. Preliminary surveys were undertaken in 2018 to try to better evaluate the status and distribution of spotted turtles on the installation. That first spring effort turned up a couple of dozen individuals. A follow-up survey with more effort in 2019 yielded over 50 individuals. With these numbers, the NRM concluded that a marking program should be implemented with better documentation for locations and times of capture going forward. The wildlife biologist on staff adopted the standardized marking protocol of etching grooves into the edge scutes of the shell indicating numerical order. To date in 2020, 85 spotted turtles have been captured, photographed, and marked.

As for conservation, PARC developed a spotted turtle fact sheet in 2017 that was distributed to the Fort Lee Range Operations office. That, plus accompanying photos have been incorporated into the Range Officer's standard slide show that every Soldier that trains on the Range must view. With these slides are clear guidelines on how to avoid disturbing spotted turtles and their wetland habitats. The slide show has been responsible for at least three additional reports of spotted turtles by Soldiers.

The turtles all occur on the range complex which comprises about 1600 acres of forested wetlands. The wetlands are mostly in the form of isolated pocket wetlands, distributed across a mixed species forest and loosely connected to three different stream systems. It is an ideal habitat for spotted turtles, and receives very little training use. The primary incursion of activity within this area is from individual Soldiers executing land navigation training. One reason for the minimum amount of use is that all of this area falls within the Surface Danger Zone (SDZ) for the firing ranges. It is off limits to activity for much of the time. The one concern that still needs to be investigated is the effects of lead contamination on the turtles from spent rounds falling into the forested wetlands. The NRM intends to address that during the period of this INRMP.

M. Pollinator Management

Fort Lee has had multiple National Public Lands Day projects that have targeted pollinator habitat creation and/or restoration. The problem has been water availability. Most sites do not have dedicated water sources and have not weathered dry summers well. This is an area that the Installation needs to focus on more, through its

landscaping and other grounds maintenance projects. All of the projects to date have taken place within the cantonment area, adjacent to existing landscaping or building areas. Starting in 2018, the NRM moved the effort out to the ranges, and established two wildflower plots on an abandoned area in the range fan. One was a mixed wildflower habitat to support general pollinators; the other a milkweed garden to support monarch butterflies along with other pollinators. In 2019, they were amended with nutrients and were quite successful.

Starting in 2020, the NRM treated with herbicide a 54-acre abandoned field that had been taken over by an exotic pear species. The field was then mowed, and treated a second time. Starting in 2021, the field will be plowed under and re-seeded in warm season grasses. Some of the edges will be left to succeed into shrub habitat. Collectively, this project will benefit pollinators, grassland birds, small mammals and birds of prey.

N. Integrated Pest Management

1. Pest Management

Fort Lee had a newly signed Installation Pest Management Plan for FY 2018. It describes the installation's pest management requirements, outlines the necessary surveillance and control requirements, and describes the administrative, safety, and environmental requirements of the program. Fort Lee no longer employs an entomologist. It handles pest management through local contractors. Family Housing on Fort Lee was privatized in 2007 and all pest control is handled by a contractor. It is identified in the lease that the Housing pest contractor will use Fort Lee approved pesticides and sub-contractors.

The majority of pest management work on Fort Lee is categorized into one of seven groups:

1: Disease vectors and medically important arthropods – mosquitoes, biting flies, ticks, bedbugs, cockroaches, spiders, ants, bees and wasps. A Zika virus source was never substantiated at Fort Lee but there were multiple cases of Zika infected personnel on the installation that had travelled in Zika infested areas. Fort Lee deploys light traps, ovitraps, and does larval collection as part of a full suite of mosquito surveillance strategies. Tick problems on the installation can be severe in some summers. There have been multiple cases of ehrlichiosis and other tick bourn problems among Fort Lee civilians and Soldiers. Routine use of personal protective equipment is advised year-round to avoid tick problems. The installation does not allow burning or spraying for ticks. Other pests in this group are managed through local contractors.

2. Real Property Pests – termites, borers, certain fungi. Control operations are usually initiated as a result of work performed in buildings where discoveries are made.

3. Stored Product Pests – Stored food pests, pests of fibers and fabrics. The post veterinarian assists in identification and resolution to stored food pests. Inspections are conducted every six months in food warehouse areas.

4. Ornamental Plant and Turf Pests – plant pests, gypsy moths, Dutch Elm disease, mildew, rust, blight, etc. This is mostly limited to inspection of landscaping material coming into the installation. Infected landscaping materials are not accepted, and exchanged for healthy material. If there is gypsy moth invasion in a given year the Forest Service can supply traps.

5. Weeds and Other Undesirable Vegetation – poison ivy, broadleaf weeds, invasive species. No routine surveys are performed for this group. Herbicide applications are used as needed around landscaping and pedestrian areas to control weedy growth. Forest inventories and botanical surveys better track the distribution of invasive species and are the trigger for solicited funding for invasive species control and management.

6. Animal pests – bats, rats, mice, skunks, squirrels, birds, etc. Rodents inside buildings are normally trapped by occupants, although local contractors may be called for extreme cases. Other mammals and birds found inside buildings are handled by DPW, usually by way of a local pest contractor. See nuisance wildlife control below for more information.

7. Household and Nuisance Pests (Arthropods) – crickets, silverfish, etc. DPW does not conduct routine surveys for these pests, but responds when requested. Preventive Medicine may conduct surveys in sensitive areas, if needed.

2. Nuisance Wildlife Control

Nuisance wildlife encompass everything from birds nesting under eaves to skunks in crawl spaces, squirrels in the attic, or snakes trying to get into buildings. The policy on Fort Lee is that if the animal is inside the building it becomes the responsibility of DPW to see that it is removed. If the animal is outside the building, the Conservation Officer assumes the responsibility for its relocation. Skunks are usually the number one wildlife nuisance species. There have been as many as 20 relocated within one month on Fort Lee, during February, an active month for young skunks seeking new territories and mates

3. Stray Animal Control

The policy for stray animals was revised in August 2020 and shares its responsibility between DPW and PMO. A stray animal call will go to the Police Desk general phone and be directed either to DPW or the Game Warden for assistance, depending on the nature of the situation. Fort Lee currently maintains a no-kill stray animal facility on post, but that facility is subject to close if a new arrangement can be negotiated with one of the local municipalities.

O. Climate Change

In 2014 DoD published the U.S. Department of Defense (DoD) 2014 Climate Change Adaptation Roadmap. The "Roadmap" lists possible impacts to plans and operations, testing and training, built and natural infrastructure, and supply chain and acquisition. It poses the issue that the occurrence and severity of these impacts will likely increase as the climate continues to change. Scientific research has confirmed a link between global warming and accumulated levels of atmospheric Greenhouse Gases (GHGs) from anthropogenic sources. Efforts relating to the reduction of GHGs (e.g., switching to renewable energy sources) are referred to as "mitigation." Accumulated GHGs will persist for decades in the atmosphere, and will continue to drive the warming processes affecting climate, even if significant emission reductions are achieved in this century. Efforts to adjust to the impacts of climate change are referred to as "adaptation" (DoD 2014).

In accordance with Unified Facilities Criteria (UFC) 2-100-01, and other DoD guidance, DoD Master Planners are directed "to consider" climate change in the development of Master Plans and projects. The Roadmap provides the analytical framework, as well as tools and other guidance, to help planners understand *how* to consider climate change in their plans and projects for installation infrastructure.

The U.S. Department of Defense (DoD) 2014 Climate Change Assessment Roadmap lists four primary climate change phenomena likely to affect DoD activities:

- Rising global temperatures
- Changing precipitation patterns
- Increasing frequency or intensity of extreme weather events
- Rising sea levels and associated storm surge

The Navy is uniquely situated to realize the potential impacts from sea level rise and other climate induced impacts before other service branches might. As a result they have taken the 2014 "Roadmap" and generated the 2017 NAVFAC Climate Change Planning Handbook: Installation Adaptation and Resilience. The Navy looked at climate variables as they relate to "hazards" (floods, high winds, etc) and how installations experience the weather or climate phenomenon; and "impacts" (infrastructure damage, power outage, etc) as the positive or negative effect on the natural or built environment.

Table 2 below shows how these climate change phenomena translate into "hazards" and "impacts" at military installations, both at a local weather level, and at the larger climate level (NAVFAC 2017).

Table 2. Hazards and Impacts of Weather / Climate

Weather Phenomenon	**Hazard**	**Impacts**
Storm Surge	Flooding, wave damage	Undercutting, erosion or failure of facility or road foundation
Thunderstorm	Flooding, wind damage	Power outages, infrastructure damage
Tornado	Wind damage	Power outages, infrastructure damage
Heat or Cold Wave	Heat stress, stress to equipment	Electrical or equipment failure, curtailment of building operations, brownouts.
Climate Phenomenon	**Hazard**	**Impacts**
Sea Level Change	Nuisance flooding, permanent inundation	Temporary or permanent loss of access to structures or roads; damage to lower floor contents.

Precipitation Changes	Flooding, lightning damage, wildfire, drought	Power outages, inaccessible roads, built structures loss to fire
Annual Average Temperature Increase	Wildfire, changes in ecology	Unhealthy natural infrastructure (e.g. forest buffer), increase in forest pests, diseases, invasive species
Extreme Temperatures	Heat stress, stress to equipment, drought	Electrical or equipment failure, curtailment of building operations, lack of water

Fort Lee participated in a Screening Level Vulnerability Assessment Survey in 2015. The survey queried DoD installations worldwide (over 3,500 individual sites) on historical impacts from weather related events. Fort Lee reported historical impacts from wind, high temperatures, rain, and drought. Impacts ranged from downed trees and damaged infrastructure to restricted training opportunities and power outages.

That survey was ultimately compiled and used to produce the following report: Department of Defense Climate-Related Risk to DoD Infrastructure Initial Vulnerability Assessment Survey (SLVAS) Report. The survey documented that the highest number of reported effects resulted from drought (782) followed closely by wind (763) and non-storm related flooding (706). The asset categories most reported as having one or more impacts in the past were: airfield operations, followed by transportation infrastructure, energy infrastructure, training/range facilities, and water/wastewater systems. Logistics/supply operations ranked last in reported effects.

The SLVAS was developed to take an initial look at where DoD assets have been affected by climate. It is the first step in an ongoing process to manage the risks associated with climate to the DoD mission, installations, and ranges.

Fort Lee is fortunate in that even though it is proximate to two rivers less than one tenth of one percent of the installation is within the tide range, or subject to be affected by tides of historically high magnitude. Also, less than 5% of the installation is within the 500 year floodplain and almost none of that component has built structures or is actively used for training. Where extreme temperatures at one time created a need for brown-outs or power-shaving, the electric company now has enough redundancy built in to preclude that problem. The major climate related issues for the installation are wind damage issues and flooding from intense rainfall events that overtake the stormwater infrastructure.

Even though infrastructure is at a relatively low threat level from climate change in the foreseeable future, natural resources are beginning to show evidence of climate impacts. Parasite populations, particularly deer ticks, are becoming more problematic and are increasingly active year-round as a result of generally milder winters. There have been multiple cases of tick-borne diseases among Fort Lee employees/residents in the last few years. At least two new invasive species have been detected in the last two years, and others are spreading at an increasing rate, also tied to longer growing seasons. Fungal problems in reptiles are increasing, seemingly tied to longer periods of high heat and humidity. Fort Lee will be beginning a study to investigate that in 2022. It is not out of the question that natural resource impacts from climate change may have a more dramatic influence on Fort Lee in the future than infrastructure and built facility impacts may have.

V. IMPLEMENTATION

A. Natural Resources Staff & Training

The Environmental Management Division maintains one GS 12 Ecologist position that serves as the natural resource manager (NRM). That person has received frequent training involving Sikes Act Issues, endangered species management and consultation, COR training and associated other administrative guidance. The NRM manages wetlands, wildlife and forestry issues, and serves as the principal GIS resource for the Division. He sets hunting harvest quotas and oversees T&E species issues, the sale of timber resources, and is responsible for invasive species control and management. He is also a Contracting Officers Representative for the management of any natural resource related contracts, and serves as the Conservation Team Lead for natural and cultural resources.

EMD had a wildlife biologist for four years starting in 2011. The position started through the intern program and then served two years as a GS 11 wildlife biologist. That person left for another job in 2015 and the position was subsequently lost from the TDA. At the beginning of FY18 EMD started to fund a contract position for wildlife management assistance. That position has been slated for recurring funding and will be maintained as long as annual funding is available. The wildlife biologist assistant helps

with the hunting program, field surveys, and data collection for assorted natural resource objectives.

With a new endangered species and a candidate species subject to be listed soon, it has become increasingly important that there be at least two natural resource staff positions. Although contract assistance is useful in data collection and management, ideally there should be two staff with decision-making authority with roles integrated into the workings of the environmental office.

B. Funding

There are several opportunities for funding within the natural resource program. The Army Forestry Reimbursable Account and the 21X5095 Wildlife Conservation Fund are two opportunities tied to the Sikes Act. Timber resources on an installation are considered "real property" and therefore owned and maintained by the installation. If a timber harvest is to be conducted, or trees cleared for construction, they must first be appraised by the U.S. Army Corps of Engineers (USACE) forester for their monetary value. The value of those trees must then be paid to the USACE upon harvest. Those funds are directed to the Army Forestry Reimbursable Account (ARA). A portion of the funds comes back to the school system of the County involved, and the remainder go to the ARA for consolidation with other installation's funds and ultimate disbursement back out to the installations as needed for forest management. Because Fort Lee does so few timber harvests, it receives very little funding from the Forestry Reimbursable Program.

For all hunting fees sold on the installation 90% of the base permit price is directed to a special fund for DPW. At the end of the hunting season, those funds are consolidated and sent to the Resource Management office where they are deposited into the Treasury in a 21X5095 account for wildlife conservation. These funds are non-year dependent and can be carried over from year to year and used whenever needed. Because of the small size of the hunting program and consequent low numbers of hunters, those funds rarely exceed a thousand dollars annually. So, of the two Sikes Act associated funding streams, there is little dependent funding for natural resource work on Fort Lee.

Normal operating funds and special project funds are derived from annual submissions to the GERB (Garrison Environmental Requirements Build). Projects are submitted in the spring, moved up through channels to the Region, and then

consolidated with those from other installations. When funding is made available, the Region generates a 1-N list with a cut line showing funded projects versus those that fell below the funding threshold. Funding is then disbursed down to the installation and individual projects are allocated funds. The installations reserve the right to move funds around within certain limits to cover shortfalls that may not have been known when the GERG was submitted. Funds normally become available by July or August in time to issue contracts by the end of the fiscal year.

Those projects not funded are then eligible for year end funds derived from extra disbursed money, returned money, or reclaimed money. It is not normal to expect all projects to be funded, but persistence tends to pay off and repeated submissions will often secure some level of funding.

C. Five Year Implementation Plan

	Rationale	Priority	To Be Funded	Funding Estimate
Wildlife Tech Support	With a new End. Species and Candidate Species, it is important that the NRM has additional manpower to assist with species surveys and monitoring, and managing the hunting program.	Critical	FY21 & recurring annually	$85K
Pine Beetle Control	Need to curb resurgence in pine beetle mortality in remaining old growth pine stands. One or more sensitive species is tied to these habitats, plus it would increase Soldier safety.	High	FY21	$90K
Invasive Species Control	Need additional funding to eradicate Chinese privet and Ailanthus from Range training areas.	High	FY21	$24K
Pollinator Habitat Creation	Funds needed to supplement pollinator habitats from FY19 and conduct basic maintenance and other habitat conversion.	Med	FY21	$12K
Grassland Creation	Conversion of abandoned field to warm-season grassland	Med	FY21	$15K
Timber Stand Improvement	Releasing more mast trees will help to open up TAs for training, improve overall forest health, and improve wildlife habitat.	Med	FY21	$20K
Invasive Species Control	Continuing funds to eradicate problematic species: Ailanthus, Phragmites, Chines Privet	Med	FY22	$26K

Pollinator Habitat	Continuing funds to convert abandoned land to pollinator habitat and grasslands.	Med	FY22	$14K
Candidate Species Surveys	Spotted turtle surveys to map and assess species density and distribution	Med	FY 22	In-house
Firebreak Maintenance	Funds to keep firebreaks open and free of deadfall and vegetation intrusion.	Med	FY 22	$14K
Wetlands Delineation	A significant component of installation wetlands were last delineated over 10 years ago, within areas with increasing development pressures.	High	FY23	$80K
Aerial Imagery Acquisition	Significant new construction and habitat restoration projects need to be imaged to assist in long term ecological monitoring and Real Property audits.	Med	FY23	$45K
Forest Inventory and Invasive Species Survey	Inventor / Survey / Mapping and Management Report	High	FY23	$90K
Planning Level Surveys	Reptile and amphibian survey - Pop status update needed in view of spread of fungal and bacterial diseases.	Med	FY24	$60K
Planning Level Surveys	Macroinsect surveys – Butterflies and dragonflies. This faunal group will need a new baseline survey. The last one in 2014 was hampered by weather issues.	Med	FY24	$45K
Timber Stand Improvement	Prescribed burn for continued habitat improvement and forest health.	Med	FY24	$25K
Invasive Species Control	Follow-up invasive species control after new forest inventory and management plan.	Med	FY24	$32K
Forest Thinning and Conversion	Use of a forestry mower to remove nuisance vegetation, open up stands, improve training land.	High	FY24	$10K
Planning Level Surveys	Avian Inventory - Funds requested to replicate avian inventory as done previously in view of habitat changes and increased development.	Med	FY25	$45K
Invasive Species Control	Follow-up invasive species control after new forest inventory and management plan.	Med	FY25	$42K
Pollinator Habitat Creation/Maintenance	Grassland restoration and pollinator habitat maintenance.	Med	FY25	$18K
Planning Level Surveys	Fish and aquatic macro-invertebrate survey.	Med	FY25	$60K

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Appendix A - 1 MBTA Status and Correspondence

United States Department of the Interior

OFFICE OF THE SOLICITOR
Washington, D.C. 20240

IN REPLY REFER TO:

DEC 22 2017

M- 37050

Memorandum

To: Secretary
Deputy Secretary
Assistant Secretary for Land and Minerals Management
Assistant Secretary for Fish and Wildlife and Parks

From: Principal Deputy Solicitor Exercising the Authority of the Solicitor Pursuant to Secretary's Order 3345

Subject: The Migratory Bird Treaty Act Does Not Prohibit Incidental Take

I. Introduction

This memorandum analyzes whether the Migratory Bird Treaty Act, 16 U.S.C. § 703 ("MBTA"), prohibits the accidental or "incidental" taking or killing of migratory birds. Unless permitted by regulation, the MBTA prohibits the "taking" and "killing" of migratory birds. "Incidental take" is take that results from an activity, but is not the purpose of that activity.

This issue was most recently addressed in Solicitor's Opinion M-37041 – *Incidental Take Prohibited Under the Migratory Bird Treaty Act*, issued January 10, 2017 (hereinafter "Opinion M-37041"), which concluded that "the MBTA's broad prohibition on taking and killing migratory birds by any means and in any manner includes incidental taking and killing."[1] Opinion M-37041 was suspended pending review on February 6, 2017.[2] In light of further analysis of the text, history, and purpose of the MBTA, as well as relevant case law, this memorandum permanently withdraws and replaces Opinion M-37041.

Interpreting the MBTA to apply to incidental or accidental actions hangs the sword of Damocles over a host of otherwise lawful and productive actions, threatening up to six months in jail and a $15,000 penalty for each and every bird injured or killed. As Justice Marshall warned, "the value of a sword of Damocles is that it hangs—not that it drops."[3] Indeed, the mere threat

[1] 2017 DEP SO LEXIS 6, *2.

[2] Memorandum from K. Jack Haugrud, Acting Secretary, to Acting Solicitor, Temporary Suspension of Certain Solicitor M-Opinions Pending Review, 2017 DEP SO LEXIS 8 (Feb. 6, 2017).

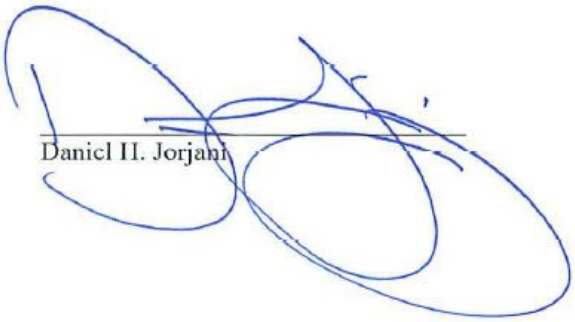
[3] *Arnett v. Kennedy*, 416 U.S 134, 231 (1974) (Marshall, J., dissenting).

of prosecution inhibits otherwise lawful conduct. For the reasons explained below, this Memorandum finds that, consistent with the text, history, and purpose of the MBTA, the statute's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs.[4]

.....

V. Conclusion

The text, history, and purpose of the MBTA demonstrate that it is a law limited in relevant part to affirmative and purposeful actions, such as hunting and poaching, that reduce migratory birds and their nests and eggs, by killing or capturing, to human control. Even assuming that the text could be subject to multiple interpretations, courts and agencies are to avoid interpreting ambiguous laws in ways that raise grave Constitutional doubts if alternative interpretations are available. Interpreting the MBTA to criminalize incidental takings raises serious due process concerns and is contrary to the fundamental principle that ambiguity in criminal statutes must be resolved in favor of defendants. Based upon the text, history, and purpose of the MBTA, and consistent with decisions in the Courts of Appeals for the Fifth, Eighth, and Ninth circuits, there is an alternative interpretation that avoids these concerns. Thus, based on the foregoing, we conclude that the MBTA's prohibition on pursuing, hunting, taking, capturing, killing, or attempting to do the same applies only applies only to direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control.



Daniel H. Jorjani

Appendix A – 2 MBTA Status and Correspondence

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400

ENERGY,
INSTALLATIONS,
AND ENVIRONMENT

FEB 06 2018

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE ARMY
(ENVIRONMENT, SAFETY AND OCCUPATIONAL HEALTH)
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT)
DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE
(ENVIRONMENT, SAFETY AND INFRASTRUCTURE)
DIRECTOR, DEFENSE LOGISTICS AGENCY (DSS-E)

SUBJECT: Incidental Take of Migratory Birds

On December 22, 2017, the U.S. Department of the Interior's Office of the Solicitor issued Solicitor's Opinion M-37050 issued the opinion that the Migratory Bird Treaty Act (MBTA) prohibition on the "taking" or "killing" of migratory birds applies only to deliberate acts intended to take a migratory birds, their nests, or their eggs. This opinion permanently withdraws and replaces Solicitor's Opinion M-37041 (issued January 10, 2017, and suspended pending review on February 6, 2017).

This opinion alone does not rescind the "military readiness rule" (50 C.F.R. §21.15), §315 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003, Executive Order 13186, or the resulting MOU with U.S. Fish and Wildlife Service. Neither does it address the split of opinions among the five Circuit Courts of Appeal that have addressed the question of whether the MBTA criminalizes some instances of incidental take, an issue that can be resolved only by U.S. Supreme Court review or congressional action. As a consequence, we advise that until further clarification is provided, the Military Departments should continue to follow existing Department of Defense guidance designed to minimize – to the extent practicable and without diminishing the effectiveness of military readiness activities – the incidental take of migratory birds.

My point of contact is Alison Dalsimer, 571-372-6893, allyn.a.dalsimer.civ@mail.mil.

Appendix A – 3 MBTA Status and Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington, D.C. 20240

In Reply Refer To:
FWS/AMB/067711

APR 11 2018

Memorandum

To: Service Directorate

From: Principal Deputy Director

Subject: Guidance on the recent M-Opinion affecting the Migratory Bird Treaty Act

To ensure consistency with the recently issued M Opinion, the U.S.Fish and Wildlife Service (FWS) is modifying some policies and practices within its programs. This memorandum provides guidance to clarify what constitutes prohibited take, what actions must be taken when conducting lawful intentional take (e.g., obtain a permit via 50 C.F.R. Part 21), and what changes to prior practice should be made in light of the M-Opinion.

The M-Opinion concludes that the take of birds resulting from an activity is not prohibited by the MBTA when the underlying purpose of that activity is not to take birds. We interpret the M-Opinion to mean that the MBTA's prohibitions on take apply when the *purpose* of an action is to take migratory birds, their eggs, or their nests. Conversely, the take of birds, eggs or nests occurring as the result of an activity, the purpose of which is not to take birds, eggs or nests, is not prohibited by the MBTA.

The mission of the Service is to work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. Migratory bird conservation remains an integral part of our mission. Further:

1. The Endangered Species Act (16 U.S.C. 35 § 1531 et seq.; ESA) and Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668c; Eagle Act), as well as some State laws and regulations are not affected by the M-Opinion.

2. The National Environmental Policy Act (NEPA, 42 U.S.C. § 4321 et seq.) provides a process under which federal agencies must evaluate the impacts of their actions on the human environment [including the natural and physical environment and relationship of people with that environment (40 C.F.R. § 1508.14)] and provide transparency to the American public. Birds are part of the human environment, and should be included in relevant environmental review processes as directed by NEPA.

The Service will continue to work with any partner that is interested in voluntarily reducing impacts to migratory birds and their habitats. We will continue to develop best management practices to protect migratory birds and their habitats in partnership with any industry, federal, state, and tribal entity as interest dictates, and in the course of project review, will continue to

provide recommendations through our advisory role under other authorities, including NEPA and the Fish and Wildlife Coordination Act (16 U.S.C. §§ 661-667e). The Service will clearly communicate relevant authorities under which we make our recommendations. The Service will ensure that our comments, recommendations, or requirements are not based on, nor imply, authority under the MBTA to regulate incidental take of migratory birds. Furthermore, the Service will not withhold a permit, request, or require mitigation based upon incidental take concerns under the MBTA. Attached is a set of questions and answers that serve to clarify the effect of the M-Opinion.

If you have additional questions, please contact the Migratory Bird Program, 202-208-1050.

Attachment

Appendix B. DoD PIF List of Mission Sensitive Species

Common Name - Species in red have history on Fort Lee	Priority	DoD Installations Breed	Winter	Migration	USFWS Birds of Cons. Concern	Genus	Species	Comments Relative to Fort Lee
Northern Bobwhite	Mission-sensitive	X	X			Colinus	virginianus	Formerly common; now rare, possibly absent.
[2]Greater Sage-Grouse	Mission-sensitive	X	X		X	Centrocercus	urophasianus	
Greater Prairie-Chicken	Mission-sensitive	X	X			Tympanuchus	cupido	
Mountain Plover	Mission-sensitive	X	X		X	Charadrius	montanus	
Burrowing Owl	Mission-sensitive	X	X	X	X	Athene	cunicularia	
Southeastern American Kestrel	Mission-sensitive	X	X		X	Falco	sparverius	
Bendire's Thrasher	Mission-sensitive	X	X		X	Toxostoma	bendirel	
[3]Golden-winged Warbler	Mission-sensitive	X			X	Vermivora	chrysoptera	
Cerulean Warbler	Mission-sensitive	X			X	Setophaga	cerulea	
Bachman's Sparrow	Mission-sensitive	X	X		X	Peucaca	aestivalis	
[2]Henslow's Sparrow	Mission-sensitive	X	X		X	Ammodramus	henslowii	
Least Tern (Atlantic Coast Pop)	Mission-sensitive	X			X	Sternula	antillarum	
[3]Tricolored Blackbird	Mission-sensitive	X	X		X	Agelaius	tricolor	
Golden Eagle	Watch List	X	X		X	Aquila	chrysaetos	
King Rail	Watch List	X				Rallus	elegans	
Snowy Plover (Gulf Coast)	Watch List	X	X		X	Charadrius	alexandrinus	
Long-billed Curlew	Watch List	X	X		X	Numenius	americanus	
Elegant Tern	Watch List	X	X			Thalasseus	elegans	
Eastern Whip-poor-will	Watch List	X			X	Caprimulgus	vociferus	Occasional breeder
Lewis's Woodpecker	Watch List	X	X		X	Melanerpes	lewis	
Red-headed Woodpecker	Watch List	X	X		X	Melanerpes	erythrocephalus	Common in Blackwater Swamp
Gilded Flicker	Watch List	X	X		X	Colaptes	chrysoides	
Loggerhead Shrike	Watch List	X	X		X	Lanius	ludovicianus	Last observed in 1998.
Gray Vireo	Watch List	X	X	X	X	Vireo	vicinior	
Le Conte's Thrasher	Watch List	X	X		X	Toxostoma	lecontei	
Prairie Warbler	Watch List	X			X	Setophaga	discolor	Last observed in 2014.
Bell's Sparrow	Watch List	X	X		X	Artemisiospiza	belli	
Baird's Sparrow	Watch List	X	X		X	Ammodramus	bairdii	
Saltmarsh Sparrow	Watch List	X	X		X	Ammodramus	caudacutus	
Brown-capped Rosy-Finch	Watch List					Leucosticte	australis	
Yellow-billed Magpie	Watch List					Pica	nuttalli	
Flammulated Owl	Watch List					Psiloscops	flammeolus	
Allen's Hummingbird	Watch List					Selasphorus	sasin	
Wood Thrush	Watch List					Hylocichla	mustelina	Formerly common; now uncommon, due to Microstegium.
Chestnut-collared Longspur	Watch List					Calcarius	ornatus	
Virginia's Warbler	Watch List					Leiothlypis	virginiae	
Canada Warbler	Watch List					Cardellina	canadensis	Occasional migrant.
Lawrence's Goldfinch	Watch List					Spinus	lawrencei	
Ashy Storm-Petrel	Watch List	X			X	Oceanodroma	homochroa	
Swallow-tailed Kite	Watch List	X				Elanoides	forticatus	
[1]Scripps's Murrelet	Watch List	X				Synthliboramphus	scrippsi	
Olive-sided Flycatcher	Watch List	X			X	Contopus	cooperi	
Pinyon Jay	Watch List	X	X		X	Gymnorhinus	cyanocephalus	
Sprague's Pipit	Watch List	X	X		X	Anthus	spragueii	
Blue-winged Warbler	Watch List	X			X	Vermivora	cyanoptera	Occasional migrant.
Kentucky Warbler	Watch List	X			X	Geothlypis	formosus	
Black-chinned Sparrow	Watch List	X			X	spizella	atrogularis	
Grasshopper Sparrow	Watch List	X			X	Ammodramus	savannarum	Common breeder on Drop Zone.
[2]Rusty Blackbird	Watch List	X	X		X	Euphagus	carolinus	Formerly uncommon in winter; not seen in last several yrs.
Black-billed Cuckoo	Watch List					Coccyzus	erythropthalmus	Occasional migrant.
[3]Black Rail	Watch List	X	X		X	Laterallus	Jamaicensis	

Prothonotary Warbler	Watch List					*Protonotaria*	*citrea*	Common in Blackwater Swamp.
Bald Eagle	Reassess in 2022	X	X		X	*Haliaeetus*	*leucocephalus*	Common visitor from nearby roost and nest sites.
Northern Goshawk	Reassess in 2022	X	X		X	*Accipiter*	*gentilis*	
Yellow Rail	Reassess in 2022	X	X		X	*Coturnicops*	*noveboracensis*	
American Oystercatcher	Reassess in 2022	X	X			*Haematopus*	*palliatus*	
Black Oystercatcher	Reassess in 2022	X			X	*Haematopus*	*bachmani*	
Wilson's Plover	Reassess in 2022	X			X	*Charadrius*	*wilsonia*	
Upland Sandpiper	Reassess in 2022	X		X	X	*Bartramia*	*longicauda*	
Buff-breasted Sandpiper	Reassess in 2022			X	X	*Tryngites*	*subruficollis*	
Gull-billed Tern	Reassess in 2022	X			X	*Gelochelidon*	*nilotica*	
Common Nighthawk	Reassess in 2022	X				*Chordeiles*	*minor*	Common in migration, may occasionally nest.
Chuck-will's-widow	Reassess in 2022	X			X	*Caprimulgus*	*carolinesis*	Occasional migrant.
Prairie Falcon	Reassess in 2022	X	X		X	*Falco*	*mexicanus*	
Brown-headed Nuthatch	Reassess in 2022	X	X		X	*Sitta*	*pusilla*	Common, but steadily decreasing habitat.
Coastal Cactus Wren	Reassess in 2022	X	X		X	*Campylorhynchus*	*brunneicapillus*	
[3]Bicknell's Thrush	Reassess in 2022	X			X	*Catharus*	*bicknelli*	
Sage Thrasher	Reassess in 2022	X	X		X	*Oreoscoptes*	*montanus*	
Crissal Thrasher	Reassess in 2022	X	X			*Toxostoma*	*crissale*	
Swainson's Warbler	Reassess in 2022	X			X	*Limnothlypis*	*swainsonii*	
Lucy's Warbler	Reassess in 2022	X			X	*Oreothlypis*	*luciae*	
Brewer's Sparrow	Reassess in 2022	X	X		X	*Spizella*	*breweri*	
Sagebrush Sparrow	Reassess in 2022	X	X		X	*Artemisiospiza*	*navedensis*	
Seaside Sparrow	Reassess in 2022	X	X		X	*Ammodramus*	*maritimus*	
Harris's Sparrow	Reassess in 2022		X		X	*Zonotrichia*	*querula*	
Painted Bunting	Reassess in 2022	X			X	*Passerina*	*ciris*	
Dickcissel	Reassess in 2022	X			X	*Spiza*	*americana*	
Eastern ("Lilian's") Meadowlark	Reassess in 2022	X	X			*Sturnella*	*magna*	
Bell's Vireo	Reassess in 2022					*Vireo*	*bellii*	
California Thrasher	Reassess in 2022					*Toxostoma*	*redivivum*	
Oak Titmouse	Reassess in 2022					*Baeolophus*	*inornatus*	
Wrentit	Reassess in 2022					*Chamaea*	*fasciata*	

[1]FWS Candidate Notice of Review

[2]Army Species at Risk

[3]Undergoing 12-month status review to determine if listing is warranted - no ESA status

Last update: 10/30/2017

From DoD PIF Steering Committee, 2017.

Appendix C.

Virginia Wildlife Action Plan, Species of Greatest Conservation Need:
That Occur, or Are Thought to Occur in the Crater Planning Region
(Which Includes Fort Lee)

Common Name	Scientific Name	Wildlife Action Plan Tier Rank*	Fort Lee Status
FRESHWATER FISHES			
Alewife	*Alosa pseudoharengus*	IV	Undocumented
American brook lamprey	*Lampetra appendix*	IV	Undocumented
American eel	*Anguilla rostrate*	III	Uncommon in Bailey Creek
American shad	*Alosa sapidissima*	IV	Undocumented
Atlantic sturgeon	*Acipenser oxyrinchus*	I	Undocumented
Banded sunfish	*Enneacanthus obesus*	IV	Undocumented
Bridle Shiner	*Notropis bifrenatus*	I	Undocumented
Ironcolor Shiner	*Notropis chalybaeus*	III	Undocumented
Lake chubsucker	*Erimyzon sucetta*	IV	Undocumented
Least brook lamprey	*Lampetra aepyptera*	IV	Undocumented
Lined topminnow	*Fundulus lineolatus*	IV	Uncommon in Bailey Creek
Mud sunfish	*Acantharchus pomotis*	IV	Uncommon in Bailey Creek
Roanoke Bass	*Ambloplites cavifrons*	I	Undocumented
AMPHIBIANS			
Carpenter frog	*Lithobates virgatipes*	III	Undocumented
Dwarf waterdog	*Necturus punctatus*	III	Undocumented
Eastern mud salamander	*Pseudotriton montanus montanus*	IV	Undocumented
Eastern spadefoot	*Scaphiophus holbrookii*	IV	Undocumented
Greater siren	*Siren lacertina*	IV	Undocumented
Eastern lesser siren	*Siren intermedia intermedia*	III	2 records for Fort Lee (2003,2004)

Little grass frog	*Pseudacris ocularis*	IV	Undocumented
Many-lined salamander	*Stereochilus marginatus*	IV	Undocumented
Oak toad	*Anaxyrus quercicus*	II	Undocumented
Southern chorus frog	*Pseudacris nigrita*	IV	Uncommon
REPTILES			
Common ribbonsnake	*Thamnophis sauritus sauritus*	IV	Uncommon
Eastern box turtle	*Terrapene carolina carolina*	III	Uncommon
Eastern hog-nosed snake	*Heterodon platirhinos*	IV	Rare
Eastern slender glass lizard	*Ophisaurus attenuates longicaudus*	IV	Undocumented
Mudsnake	*Farancia abacura abacura*	IV	Undocumented
Northern diamondback terrapin	*Malaclemys terrapin terrapin*	II	Undocumented
Queen snake	*Regina septemvittata*	IV	Undocumented
Rainbow snake	*Farancia erytrogramma erytrogramma*	IV	Undocumented
Scarletsnake	*Cemophora coccinea copei*	IV	Undocumented
Southeastern crowned snake	*Tantilla coronate*	IV	Undocumented
Spotted turtle	*Clemmys guttata*	III	Uncommon
Yellow-bellied slider	*Trachemys scripta scripta*	IV	Uncommon
BIRDS			
American black duck	*Anas rubripes*	II	Uncommon; primarily in winter
American woodcock	*Scolopax minor*	II	Uncommon in migration; rare nesting.
Bank swallow	*Riparia riparia*	III	Uncommon in migration; nests nearby.
Barn owl	*Tyto alba*	III	Undocumented
Belted kingfisher	*Megaceryle Icyon*	III	Year round in Blackwater Swamp
Bicknell's thrush	*Catharus bicknelli*	IV	Undocumented in migration.
Black-and-white warbler	*Mniotilta varia*	IV	Common in migration; rare nesting.
Black-crowned night heron	*Nycticorax nycticorax*	III	Undocumented
Brown thrasher	*Toxostoma rufum*	IV	Uncommon breeder
Chimney swift	*Chaetura pelagica*	IV	Uncommon breeder in old chimneys.

Clapper Rail	*Rallus longirostris*	IV	Undocumented; no habitat.
Common Tern	*Sterna hirundo*	II	Undocumented; no habitat.
Dunlin	*Calidris alpina hudsonia*	IV	Undocumented; no habitat.
Eastern kingbird	*Tyrannus tyrannus*	IV	Uncommon breeder
Eastern meadowlark	*Sturnella magna*	IV	Uncommon breeder on Drop Zone/ landfills
Eastern towhee	*Pipilo erythrophthalmus*	IV	Uncommon breeder
Eastern whip-poor-will	*Anstrostomus vociferous*	III	Former nester; no longer thought to occur.
Eastern wood-pewee	*Contopus vociferous*	IV	Common breeder
Field sparrow	*Spizella pusilla*	IV	Uncommon breeder
Forster's tern	*Sterna forsteri*	III	Undocumented; no habitat.
Grasshopper sparrow	*Ammodramus savannarum*	IV	Common breeder on Drop Zone.
Gray catbird	*Dumetella carolinensis*	IV	Uncommon to rare year round
Greater scaup	*Aythya marila*	IV	Undocumented
Green heron	*Butorides virescens*	IV	Uncommon visitor; rare nesting.
Kentucky warbler	*Geothlypis Formosa*	III	Former nester; now only rare migrant.
King rail	*Rallus elegans*	II	Undocumented
Least bittern	*Ixobrychus exilis*	III	Undocumented
Northern bobwhite	*Bolinus virginianus*	III	Formerly common; now likely absent.
Northern harrier	*Circus cyaneus*	III	Uncommon winter; past breeding attempt.
Northern rough-winged swallow	*Stelgidopteryx serripennis*	IV	Common in migration; uncommon in summer; breeds locally.
Short-billed dowitcher	*Limnodromus griseus*	IV	Undocumented
Swainson's warbler	*Limnothlypis swainsonii*	II	Undocumented
Wood thrush	*Hylocichla mustelina*	IV	Formerly common nester; now uncommon.
Yellow-billed cuckoo	*Coccyzus americanus*	III	Uncommon breeder.
Yellow-breasted chat	*Icteria virens*	IV	Former breeder; no habitat remaining now.
MAMMALS			
Cotton mouse	*Peromyscus gossypinus gossypinus*	IV	Undocumented

Marsh rabbit	*Sylvilagus palustris palustris*	IV	Undocumented
Southeastern fox squirrel	*Sciurus niger niger*	III	Undocumented
Southeastern myotis	*Myotis austroriparius*	IV	Undocumented
MOLLUSCS			
Alewife floater	*Anondonta implicate*	IV	Undocumented, but all previous survey work on Fort Lee has never identified mussels to the species level. Of the few genera identified to date, none have been from this list.
Atlantic spike	*Elliptio producta*	IV	
Carolina lance mussel	*Elliptio angustata*	IV	
Carolina slabshell mussel	*Elliptio congaraea*	IV	
Creeper	*Strophitus undulatus*	IV	
Eastern pondmussel	*Ligumia nasuta*	IV	
Gravel elimia	*Elimia catenaria*	IV	
Northern lance mussel	*Elliptio fisheriana*	IV	
Notched rainbow	*Villosa constricta*	III	
Ridged lioplax	*Lioplax subcarinata*	IV	
Roanoke slabshell	*Elliptio roanokensis*	II	
Sharp sprite	*Promenetus exacuous*	IV	
Triangle floater	*Alasmidonta cariosa*	II	
Yellow lampmussel	*Lampsillis cariosa*	II	
Yellow lance	*Elliptio lanceolate*	II	
INSECTS			
Rare skipper	Problema bulenta	II	Undocumented

* Tier Ranking:

I – Critical Conservation Need: extremely high risk of extinction or extirpation. Populations at critically low levels, face real threats, and/or occur within extremely limited range.

II – Very High Conservation Need: high risk of extinction or extirpation. Populations at very low levels, face threats, and/or occur within a very limited distribution.

III – High Conservation Need: extinction or extirpation is possible. Populations are in decline, have declined to low levels, or are restricted in range.

IV – Moderate Conservation Need: may be rare in parts of range, particularly on periphery. Populations have demonstrated a declining trend, or declining trend is suspected, which may qualify for higher tier in the future.

Source: Virginia Dept. Game and Inland Fisheries. 2015.

Appendix D.

Threatened & Endangered Species Recorded for Prince George, County and Migratory Birds of Conservation Concern

Common Name	**Latin Name**	**Fed. Status**	**State Status**	**Fort Lee Status**
Threatened & Endangered Species				
Northern long-eared bat	*Myotis septentrionalis*	T	T	Known only from wintering individuals recorded acoustically in Blackwater Swamp in 2017 & 2018.*
Sensitive joint vetch	*Aeschynomene virginica*	T	Cand.	Undocumented at Fort Lee.
Migratory Birds		Fort Lee Status		
American Kestrel	*Falco sparverius*	Summer resident, and winter visitor on Range.		
Bald Eagle	*Haliaeetus leucocephalus*	Common year-round visitor. Nests and roosts near Fort Lee.		
Bobolink	*Dolichonyx oryzivorus*	Rare migrant on Range grasslands.		
Buff-breasted Sandpiper	*Calidris subruficollis*	Undocumented at Fort Lee.		
Canada Warbler	*Cardellina canadensis*	Rare spring and fall migrant.		
Clapper Rail	*Rallus crepitans*	Undocumented at Fort Lee.		
Dunlin	*Calidris alpine*	Undocumented at Fort Lee.		
Eastern Whip-poor-will	*Antrostomus vociferous*	Rare breeder in Range woodlands.		
Hudsonian Godwit	*Limosa haemastica*	Undocumented at Fort Lee.		
Kentucky Warbler	*Geothlypis formosa*	Former breeding bird, now only recorded as spring and fall migrant. Breeding habitat overtaken by Microstegium.		
Le Conte's Sparrow	*Ammospiza leconteii*	Undocumented at Fort Lee		
Least Tern	*Sternula antillarum*	Undocumented at Fort Lee		
Lesser Yellowlegs	*Tringa flavipes*	Rare migrant on open wetlands.		
Prairie Warbler	*Setophaga discolor*	Former breeder, now only recorded as spring and fall migrant. Breeding habitat matured out of use.		
Prothonotary Warbler	*Protonotaria citrea*	Common breeder in Blackwater Swamp.		
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Common breeder in Blackwater Swamp and associated woodlands.		
Rusty Blackbird	*Euphagus carolinus*	Rare winter visitor to forested wetlands.		
Semipalmated Sandpiper	*Calidris pusilla*	Undocumented at Fort Lee.		

Short-billed Dowitcher	*Limnodromus griseus*	Undocumented on Fort Lee.
Willet	*Tringa semipalmata*	Undocumented on Fort Lee
Wood Thrush	*Hylocichla mustelina*	Former common breeder, now only rarely observed in breeding season. Habitat overtaken by Microstegium.

* De La Cruz, Jesse and W. Mark Ford. 2020. Occupancy and Roost Ecology of the Northern Long-eared and Indiana Bat on the Coastal Plain of Virginia and North Carolina, Virginia Department of Wildlife Resources Project EP2858740, U.S. Geological Survey Science Support Program Project G17AC00288 and National Council of Air and Stream Improvement Project EW-EWG-2142 to Virginia Tech.