

8.0 PROTECTED SPECIES

This section describes the potential for federal and state threatened or endangered species to occur within the project area.

8.1 FEDERALLY PROTECTED SPECIES

Federally protected plant and animal species are listed under the Federal Endangered Species Act. A site-specific species list was obtained from the U.S. Fish and Wildlife Service (USFWS) using the Information, Planning and Conservation System and was included in an on line project review request to USFWS on December 12, 2014.

The USFWS issued a Biological Opinion for effects to the federal threatened northern long-eared bat (*Myotis septentrionalis*, NLEB) on May 7, 2015, included as Attachment 1 at the end of this section.

Common Name	Scientific Name	Federal Status¹	Status in the proposed site
Michaux's sumac	<i>Rhus michauxii</i>	Endangered	Not present
Dwarf wedge mussel	<i>Alasmidonta heterodon</i>	Endangered	Not present
Roanoke logperch	<i>Percina rex</i>	Endangered	Not present
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Present
Bald eagle	<i>Haliaeetus leucocephalus</i>	Other ²	Present within 600 feet of site property line

Notes:

¹ Listed by USFWS

² Bald Eagle is protected under the Bald and Golden Eagle Protection Act.

Michaux's sumac (*Rhus michauxii*) is a federally listed endangered plant that prefers openings or thin woods, and is dependent on some form of disturbance. Due to the habitat conditions on Parcel 21/20 and LRA Parcel 9, it is unlikely that Michaux's sumac would occur in these areas. Fringe areas of the forest areas on these parcels are dominated by invasive and pioneer shrubs species much larger than Michaux's sumac, and which would likely out-compete the species for space and necessary resources. The frequent use of mowing instead of prescribed burning of open areas also makes the habitat unlikely to support this species and the probability for the presence of this plant is low on Parcel 21/20 and LRA Parcel 9. Although the Grid Parcel is primarily comprised of early successional forests and maintained areas such as roadsides and utility easement, the utility easements are either not wide enough to offer suitable habitat and/or are dominated by invasive and pioneer species. A power line easement east of LRA Parcel 9 and north of West Entrance Road was determined to contain potential habitat for Michaux's sumac. The easement is mowed but infrequently enough to allow saplings and shrubs to grow. A field survey for Michaux's sumac was conducted in June 2012 in support of the FASTC project, and this species was not identified in this area.

The dwarf wedge mussel (*Alasmidonta heterodon*) is a historically rare freshwater mussel species with distribution confined to Atlantic slope drainages from North Carolina to New Brunswick, Canada. The dwarf wedge mussel has been recorded in approximately 70 localities

in 15 major drainages since the species' discovery in the early 1800s. It is now thought to have been extirpated from all but 20 localities, one of which is the Nottoway River. The 20 known remaining populations, with one exception, are thought to be relatively small and to be declining as a result of agricultural, industrial, commercial, and domestic pollution/runoff. Channelization, removal of shoreline vegetation, development, and road and dam construction also threaten some populations. Dwarf wedge mussels live in muddy sand, sand, and gravel bottoms in creeks and rivers. The stream habitat located on LRA Parcel 9 is listed on the Virginia 303(d) list of impaired waters due to nonattainment of the dissolved oxygen standard. The stream does not meet its designated use for aquatic life and would not support populations of dwarf wedge mussel. The stream habitat on Parcel 21/20 is seasonally intermittent near the headwaters and/or contains unconsolidated sediments in addition to runs of exposed bedrock. Due to the lack of suitable stream habitat for the dwarf wedge mussel, the species is unlikely to occur in the streams located on Parcel 21/20. Streams on the Grid Parcel are seasonally intermittent, lacking swift flowing water, and have fine grained sediments on stream bottoms and therefore, would not offer suitable habitat for dwarf wedge mussel.

The Roanoke logperch (*Percina rex*) is endemic to Virginia and limited to six distinct populations, one of which is contained in the Nottoway River. Logperch are found in relatively medium to large shallow, warm streams with unsilted rocky substrates and have been identified outside of the proposed site in the main stem of the Nottoway River, primarily within pool areas. They are considered a visual predator and any reductions in visibility due to sedimentation interfere with their success. They are generally an indicator of high stream quality and are therefore not likely to be found on LRA Parcel 9 where the stream habitat is listed on the Virginia 303(d) list of impaired waters due to nonattainment of the dissolved oxygen standard and does not meet its designated use for aquatic life. Only three of the tributaries to the Nottoway River have been documented containing logperch, none of which fall within the proposed site. Streams on the Grid Parcel are seasonally intermittent, lacking swift flowing water, and contain fine grained bottom sediments. Therefore, they would not offer suitable habitat for Roanoke logperch. Stream habitat on Parcel 21/20 is seasonally intermittent or contains unconsolidated sediments in addition to runs of exposed bedrock and would not be suitable habitat for Roanoke logperch.

The NLEB was listed as a threatened species under the Endangered Species Act in April 2015 due to the severe and immediate threat of the disease, white-nose syndrome, on the species persistence in the wild. The NLEB hibernates in the small cracks and crevices of caves and mines that have large passages and relatively constant, cool temperatures with high humidity and no air currents. During the summer they roost singly or in colonies underneath bark or in cavities, crevices, or hollows of both live and dead trees within forests, woodlots with dense or loose aggregates of trees, riparian forests, and other wooded corridors. Males or non-reproductive females may also roost in caves or mines. In addition, NLEBs have been observed roosting in structures such as barns and bridges. They are not considered to be a long-distance migrant, as they typically migrate 35–55 miles between their winter hibernacula and summer habitat. In 2008, prior to the introduction of white-nose syndrome in Virginia, the NLEB was widespread on Fort Pickett.

A field survey for NLEB was conducted in August 2014 in support of the proposed FASTC project, and the presence of this species was confirmed via acoustic detections on Parcel 21/20 and LRA Parcel 9. There were no detections on the Grid Parcel. Two male NLEB were captured in mist nets on LRA Parcel 9 during the surveys, and none were captured on Parcel 21/20. The detections were within all forest types and were within or near the proposed facility development areas. The presence of maternity roosts was not confirmed during the survey; however, suitable summer habitat is present in the proposed site and maternity roosts may be present.

Although no longer a listed species under the Endangered Species Act, the bald eagle is protected under the Bald and Golden Eagle Protection Act (Federal Regulations 2012). There are three known active bald eagle nests at Fort Pickett; however, no eagle concentration areas are present. One active nest, designated by Commonwealth of Virginia Department of Game and Inland Fisheries (VDGIF) as Nest Code NY0801, is located on Hurricane Branch approximately 2.5 miles south of LRA Parcel 9 outside the proposed site. A second active bald eagle nest was discovered near Parcel 21/20 during a 2012 field survey and has been designated by VDGIF as Nest Code NY1201. The nest is located approximately 440 feet east and 225 feet south of the southeast Parcel 21/20 boundary near existing VaARNG outdoor firing range 7. The third nest was discovered during an aerial eagle nest survey in 2013 and is located on Tommeheton Brook within the Controlled Access Area approximately 4 miles east of Parcel 21/20. This nest has not yet been assigned a nest code by VDGIF.

Bald eagles are known to occur on Parcel 21/20 and LRA Parcel 9; however, based on field observation, there are no known bald eagle nests in these areas. The early successional nature of the forests and dense understory on the Grid Parcel render this area unsuitable habitat for bald eagles.

For the bald eagle nest that was observed approximately 440 feet east and 225 feet south of the southeast Parcel 21/20 boundary, near existing VaARNG outdoor firing range 7. Construction of the Firearms Training Environment on Parcel 21/20 would occur outside the 660-foot buffer for the bald eagle nest. As a result, construction would not result in any “takes” of bald eagles, as defined by the Bald and Golden Eagle Protection Act.

8.2 STATE PROTECTED SPECIES

The Virginia Department of Agriculture and Consumer Services and VDGIF have authority over the protection of endangered and threatened plant and animal species, respectively, in Virginia. DCR, Division of Natural Heritage maintains the list of state and federal listed species in Virginia. Virginia protected plant and animal species identified as having the potential to occur in the vicinity of the proposed site are listed in **Table 8.2**. The list was obtained via an online three-mile radius search through the Virginia Fish and Wildlife Information Service. The search information and determination of presence and potential impacts to state-listed threatened and endangered species was provided to the Virginia agencies in 2012 during the Draft EIS process (Attachment 2). The search was updated for the Supplemental EIS in 2014. The service provides the most current and comprehensive information about Virginia's wildlife resources. Because the minimum search radius for this service is three-miles, areas outside of the

proposed site boundary were included and all species do not necessarily pertain to the proposed site.

Table 8.2. State Protected Species Potentially Occurring in Study Area.		
Common Name	Scientific Name	State Status¹
Red-cockaded Woodpecker	<i>Piocooides borealis</i>	SE ²
Upland Sandpiper	<i>Bartramia longicauda</i>	ST
Loggerhead Shrike	<i>Lanius ludovicianus</i>	ST
Migrant Loggerhead Shrike	<i>Lanius ludovicianus migrans</i>	ST
Bachman's Sparrow	<i>Aimophila aestivalis</i>	ST
Atlantic Pigtoe	<i>Fusconaia masoni</i>	ST
Whitemouth Shiner	<i>Notropis alborus</i>	ST
Roanoke Logperch	<i>Percina rex</i>	ST
Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	ST
Bald Eagle	<i>Haliaeetus leucocephalus</i>	ST

¹Listed by Virginia Fish and Wildlife Information Service

²SE- state endangered, ST- state threatened

For information pertaining to existing conditions for Roanoke logperch, dwarf wedge mussels, and bald eagle, refer to the previous section **Federally Protected Species**.

Red-cockaded woodpecker (*Piocooides borealis*) is listed as an endangered species within the Commonwealth of Virginia. Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat (clusters). Large old pines are required as cavity trees because the cavities are excavated completely within inactive heartwood, so that the cavity interior remains free from resin that can entrap the birds. Also, old pines are preferred as cavity trees, because of the higher incidence of the heartwood decay that greatly facilitates cavity excavation. Cavity trees must be in open stands with little or no hardwood midstory and few or no overstory hardwoods, a condition frequently resulting from periodic burning of the understory.

Hardwood encroachment resulting from fire suppression is a well-known cause of cluster abandonment. Red-cockaded woodpeckers also require abundant foraging habitat. Suitable foraging habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass and forb groundcovers. The proposed site does not undergo prescribed burning and, therefore, the forested areas of the study area do not meet the habitat requirements for red-cockaded woodpeckers. Additionally, according to the Fort Pickett INRMP, this species has never been documented at Fort Pickett. Therefore, this species is unlikely to occur in the proposed site.

Upland sandpipers (*Bartramia longiccauda*) are birds of open country and characteristic of short-grass prairie. They may be found in large fallow fields, pastures, and grassy areas (greater than 250 acres). Upland sandpipers need a mosaic of grasses in a large area, using the shorter grass areas for foraging and courtship and the taller grasses for nesting and brood cover. They are likely a fall migrant in Nottoway County. None of the grass field areas within the

proposed site are large enough to be considered upland sandpiper habitat and this species is not likely to be present within in the proposed site.

The loggerhead shrike (*Lanius ludovicianus*) is a resident bird subspecies of shrike. Loggerhead shrikes prefer short grass pastures with scattered shrubs and fencerows or small utility lines. They have been observed using agricultural landscapes, shelterbelts, cemeteries, golf courses, and reclaimed strip mines in other parts of their range. Essential elements in suitable habitat include short grasses and forbs interspersed with perching locations for hunting and shrubs/small trees for nesting. Where shrubs and low trees are not present, there are no occurrences of shrikes. Preferred nest trees are thorny species (e.g., hawthorn and locust). Because they do not have powerful talons, loggerhead shrikes often impale their prey on the thorns of such trees in order to hold it in place. Territories are usually about 15-20 acres in size. Prescribed burns are beneficial to shrike habitat because it reduces midstory woody vegetation and promotes herbaceous layer, which increases prey. According to the Fort Pickett INRMP, loggerhead shrikes have never been documented at Fort Pickett. The habitat present in the proposed site does not meet the requirements for loggerhead shrike; therefore, this species is not likely to be present in the proposed site. The USFWS Biological Opinion stipulating all conservation measures and non-discretionary terms and conditions to minimize effects on NLEB is included as Attachment 1 following this section.

The migrant loggerhead shrike (*Lanius ludovicianus migrans*) is a migrant subspecies of shrike that differs slightly in coloring and has shorter wings than the resident species of shrike. Breeding season is similar to resident shrike, but migratory populations of shrike head northward to breeding ground from early April to May. The habitat for migrant loggerhead shrike is similar to that of resident shrike. Migrant loggerhead shrike have never been documented or observed at Fort Pickett. In addition, the habitat present in the proposed site does not meet the requirements for migrant loggerhead shrike; therefore, this species is not likely to be present in the proposed site.

The Bachman's sparrow (*Aimophila aestivalis*) historically inhabited open pine forests, but has also adapted to open clear cuts and utility rights-of-way where open grassy habitat exists. It has been observed on Fort Pickett in association with frequently burned areas, however, areas burned too infrequent or too frequently are abandoned. Bachman's sparrow is commonly found in pine savannahs with sparse understory and shrub growth, or areas with adequate ground cover of grass and forbs. All confirmed sightings of Bachman's sparrows at Fort Pickett to date have been within the Controlled Access Area or to the north of this area. The frequent fires caused by military training that occur in the Controlled Access Area provide the necessary habitat for the Bachman's sparrow. Bachman's sparrow have not been documented in the proposed site and because of the lack of burn maintenance, the proposed site does not contain suitable habitat for Bachman's sparrow. Therefore, this species is not likely to occur.

The Atlantic pigtoe mussel (*Fusconaia masoni*) requires fast-flowing, well-oxygenated streams and is restricted to fairly pristine habitats. They are very sensitive to sedimentation and channel modification, and the larvae are extremely sensitive to pollution. The Nottoway River is habitat to one of the healthiest populations of Atlantic pigtoe mussel, and although the species has been documented at Fort Pickett previously, there was no presence of them during a 2006

survey. The stream habitat on LRA Parcel 9 is listed on the Virginia 303(d) list of impaired waters due to nonattainment of the dissolved oxygen standard and does not meet its designated use for aquatic life. Therefore, the Atlantic pigtoe is not likely to occur. Stream habitat on Parcel 21/20 is seasonally intermittent or contains unconsolidated sediments in addition to runs of exposed bedrock and would not provide suitable habitat for Atlantic pigtoe.

Whitemouth shiners (*Notropis alborus*) are known to occur from North Carolina river drainages to Virginia where they occur in the Chowan and Roanoke drainages. Shiner inhabit small to medium sized warm streams that are high to medium gradient. They prefer clear to turbid water streams with sand to rubble bedrock substrate and a swift current with alternating pools and riffles. Whitemouth shiner habitat is threatened by development and land use practices that cause sedimentation of stream characteristics and by impoundments. Parcel 21/20 contains Birchin Creek and several unnamed tributaries. Birchin Creek contains two large manmade impoundments and many portions of its drainage are slow moving and marshy, forming extensive wetlands. The presence of the impoundments would prevent the movement of fish between the Nottoway River and Birchin Lake to the south of Parcel 21/20. The low stream flows and marsh habitats associated with Birchin Creek are not likely to support populations of whitemouth shiner. Therefore, this species is not likely to occur on Parcel 21/20. Streams on the Grid Parcel are seasonally intermittent and lacking swift flowing water, and would therefore not offer suitable habitat for whitemouth shiner. The stream habitat located on LRA Parcel 9 is listed on the Virginia 303(d) list of impaired waters due to nonattainment of the dissolved oxygen standard. The stream does not meet its designated use for aquatic life. Therefore, it is unlikely to support populations of whitemouth shiner.

ATTACHMENT 1



United States Department of the Interior

FISH AND WILDLIFE SERVICE



Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

May 7, 2015

Mr. Myles Vaughan
NEPA Program Manager
U.S. General Services Administration
20 North 8th Street
Philadelphia, PA 19107-3191

Re: Foreign Affairs Security Training
Center, Fort Pickett, Nottoway County, VA,
Project # 2015-F-0446

Dear Mr. Vaughan:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the referenced project and its effects on the federally listed threatened northern long-eared bat (*Myotis septentrionalis*; NLEB) in accordance with section 7 of the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). Your December 23, 2014 request for formal conference was received on December 23, 2014. On April 2, 2015 the Service listed the NLEB as threatened under the ESA and published a species-specific interim rule pursuant to section 4(d) of the ESA. Per our discussion on April 8, 2015, the formal conference opinion has been converted into a biological opinion.

This biological opinion is based on information provided in General Service Administration's (GSA) December 2014 Biological Assessment (BA) for Construction and Operation of the Proposed U.S. Department of State, Bureau of Diplomatic Security Foreign Affairs Security Training Center (FASTC) in Nottoway County, VA; GSA's 2012 Draft Environmental Impact Statement (EIS) for the FASTC; GSA's January 2015 Supplemental Draft EIS for the FASTC; telephone conversations; field investigations; and other sources of information. A complete administrative record of this consultation is on file in this office.

CONSULTATION HISTORY

07-16-12 GSA sent a letter to the Service requesting informal consultation on the proposed acquisition of land and development of the proposed FASTC project. That letter concluded that the proposed FASTC would have no effect on Michaux's sumac (*Rhus michauxii*), Roanoke perch (*Percina rex*), and dwarf wedgemussel (*Alasmidonta heterodon*).

Mr. Vaughan

Page 2

- 08-16-12 The Service sent a letter to GSA concurring with its “no effect” determinations.
- 12-23-14 GSA sent a letter to the Service asking to initiate a formal conference on the effects of the construction and operation of the FASTC on the NLEB. That letter reiterated GSA’s earlier conclusion that the FASTC would have no effect on Michaux’s sumac, Roanoke perch, and dwarf wedgemussel.
- 02-20-15 The Service responded to GSA’s December 23, 2014 letter acknowledging initiation of a formal conference.
- 03-13-15 GSA asked the Service to modify the description of the proposed FASTC to include a 1.35-acre Ammunition Supply Point to Package 5.
- 04-02-15 The Service listed the NLEB as threatened under the ESA and published a species-specific interim rule pursuant to section 4(d) of the ESA.
- 04-08-15 The Service and GSA discussed the need for formal consultation versus formal conference. The Service indicated the draft conference opinion would be converted to a biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

GSA proposes to construct and operate the proposed FASTC on approximately 1,381 acres of land on Fort Pickett, Nottoway County, VA (Figure 1). The purpose of the proposed FASTC is to consolidate existing dispersed training functions into a single location that can provide hard skills training specifically designed to enable personnel to conduct security operations and activities in high-threat environments abroad.

As proposed, the FASTC would be constructed in up to 5 phases or “packages” over a 5-year period, depending on funding. Package 1 includes venues essential to commence operation of the FASTC training program and that either avoid impacts to regulated wetland areas or could be constructed prior to completion of the wetland permitting process. Construction on the venues in this package would begin in summer 2015 and would begin to operate in 2016 with approximately 10 percent of training operations underway.

Construction of Packages 2 and 3 would begin in fall or winter of 2015/2016. Construction of Packages 4 and 5 would begin in fall or winter of 2016/2017. By 2018, all training venues fundamental to the FASTC training program are expected to be in place and 90 percent of training programs are expected to be operational. By 2020, 100 percent of training is expected to be operational. Actual phasing schedules will depend on timeframes for design and appropriated funding from Congress.

All of the venues (Table 1) will be located in 3 general areas: (1) the 727-acre Nottoway County Local Redevelopment Authority Parcel 9 (LRA Parcel 9), (2) the 74-acre Fort Pickett Grid

Mr. Vaughan

Page 3

Parcel (Grid Parcel), and (3) the 549-acre Fort Pickett Parcel 21/20 (Parcel 21/20). Below is a synopsis of the proposed construction activities associated with each parcel. Greater detail on each component is provided in GSA's January 2015 Supplemental Draft EIS (GSA 2015) and December 2014 BA (GSA 2014).

Table 1. Proposed FASTC venues.

Facility	Name	Use	Size
Core Area			
A01	Administrative and Classroom Building	Offices and Classrooms	82,009 ft ²
A08	Fitness Center	Fitness Training	13,930 ft ²
T01	Tactical Training Building	Tactical Training	26,458 ft ²
High Speed Driving Track Area			
D02	High Speed Anti-Terrorism Driving Course	Driving Training	550 acres*
D02a	Classroom Building (track 1)	Driving Training	3,106 ft ²
D02b	Classroom Building (track 2)	Driving Training	3,106 ft ²
D02c	Classroom Building (track 3)	Driving Training	3,106 ft ²
Off-Road/Unimproved Driving Track Area			
D04	Unimproved Road Driving Course	Driving Training	100 acres*
D05	Off-Road Driving Course	Driving Training	100 acres*
D03a/D04a/D05a	Driver Courses Classroom Buildings	Driving Training	4,851 ft ²
Mock Urban Training Environment			
D03	Mock Urban Driving Course	Driving Training	80 acres*
E04	Explosives Simulation Alley	Explosives Training	20 acres*
E04a	Explosives Simulation Alley Classroom Building	Explosives Training	3,106 ft ²
E04b	Explosives Simulation Alley Structures	Explosives Training	35,000 ft ²
E04c	Explosives Simulation Workshop	Explosives Training	500 ft ²
T02	Mock Urban Tactical Training Area/Embassy	Tactical Training	80,792 ft ²
T03	Rappel Tower in Mock Urban Environment	Tactical Training	2,592 ft ²
T04	Tactical Maze	Tactical Training	18,335 ft ²
T05	Smoke House	Tactical Training	3,680 ft ²
Explosives Training Environment			
E02	Explosives Demonstration Range	Explosives Training	100 acres*
E02a	Explosives Demonstration Range Classroom	Explosives Training	3,106 ft ²
E03	Post-Blast Training Range	Explosives Training	200 acres*
E03a	Post-Blast Training Range Classroom	Explosives Training	3,888 ft ²
E05	Explosive Breaching Range	Explosives Training	200 acres*
E05a	Explosive Breaching Range Classrooms	Explosives Training	5,106 ft ²
E05b	Explosive Breaching House	Explosives Training	3,200 ft ²
E05c	Explosive Breaching Wall 1	Explosives Training	N/A
E05d	Explosive Breaching Wall 2	Explosives Training	N/A
E05e	Explosive Breaching Range Storage	Storage	1,980 ft ²
Firearms Training Environment			
R02/R04	25-m Indoor/100-m Outdoor Firing Range	Firearms Training	184,900 ft ²
R03b	Live-Fire Shoot House	Firearms Training	4,787 ft ²
R03c/R05a/R07	Armory and Classroom	Firearms Storage/Training	41,266 ft ²
R08	Ammunition Supply Point	Ammunitions and Explosives Storage	58,644 ft ²
Service Area			
A09/I01	Central Warehouse and Public Works	Central Storage/Maintenance	22,261 ft ²
Driver Training Maintenance Area			
D06	Vehicle Maintenance Shop	Vehicle Maintenance	11,328 ft ²
D06a	400 Space Parking Deck	Training Vehicle Parking	144,970 ft ²
General			
All Areas	1,231 Distributed Parking Spaces	Parking	5 acres
Total FASTC Facilities			766,007 ft ² (1,381 acres*)

*Acreage listed is the entire area available for proposed facilities and infrastructure and does not signify that the entire area will be cleared.

LRA Parcel 9

Most of the venues will be constructed in this parcel. Portions of this parcel will be cleared during summer 2015 to construct the Mock Urban Tactical Training Area and Mock Embassy,

Mr. Vaughan

Page 4

Rappel Tower, Tactical Maze, and Smoke House (Figure 1). Driver training on the Mock Urban Tactical Training Area will include 36 operations per day. The Mock Embassy compound will consist of 8 buildings resembling a standard U.S. embassy, surrounded by a wall, and positioned adjacent to all other training venues of the Mock Urban Training Environment.

During later phases of the FASTC construction, the Mock Urban Driving Course, Explosives Simulation Alley, High Speed Driving Track Area, Driver Training Maintenance Area, Off-Road/Unimproved Driving Track Area, and 1.35-acre Ammunition Supply Point will be located in this parcel. Training in the High Speed Driving Track Area will consist of 810 drive track operations per day with cars traveling up to 100 miles per hour. The Driver Training Maintenance Area will provide centralized vehicle storage and maintenance facilities supporting all driver training activities for FASTC.

Grid Parcel

Venues constructed on this parcel include the Administrative Office and Classroom Building, Tactical Training Building, Fitness Center, and Service Area (Figure 1). The latter includes the Central Warehouse and Public Works buildings.

Parcel 21/20

Venues constructed on this parcel include the Explosives Training Environment (Post-Blast Training Range and Explosives Breaching Range), Explosives Demonstration Range, Firing Ranges, Shoot House, Armory, and classroom buildings (Figure 1). The Explosives Demonstration Range and associated classroom building will be constructed in 2015 as part of Package 1. The remaining venues will be constructed between 2015 and 2018.

The Explosives Training Environment will consist of Post-Blast Training Range and Explosives Breaching Range. Explosives training will consist of 2,783 detonations of 0.2-ounce to 1.5-pound net explosive weight (NEW) charges, 36 detonations of 2.23-pound NEW charges, and 18 detonations of 3-pound NEW charges per year.

The location of the explosive ranges associated with the Explosives Training Environment will interrupt 2 existing primary tank routes on Fort Pickett. The north-south tank trail (Trimble Road) and the primary east-west tank trail (Butterwood Road) will be relocated around the proposed explosive ranges to maintain the connection between Dearing Avenue and Trainfire Road and preserve the existing Fort Pickett circulation. The rerouted tank trail will extend from Dearing Avenue north of the existing Butterwood Road to and through the northern portion of Parcel 21/20. The new route will be cleared during Package 3 and impact 12 acres between Parcel 21/20 and Dearing Avenue. The 100-acre Explosives Demonstration Range will be used to detonate a maximum charge of 0.5-pound NEW explosive charges. The demonstration site will contain 2 pads, a 200-foot (ft) by 200-ft blast pad with a sifted sand base, and a 100-ft diameter post-blast recovery pad. The 200-acre Post-Blast Training Range will support the detonation of a maximum charge of 3 pounds NEW. The site will contain a 400-ft by 400-ft explosives demonstration pad with a sifted sand base and a 6-inch asphalt post-blast recovery pad. The range will have a viewing area, bleacher seating for 30 people, and surface parking. The

Mr. Vaughan

Page 5

Explosives Demonstration Range Classroom Building includes a 36-space parking area. The Firearms Training Environment will be constructed on this parcel. This environment includes construction of an armory and classroom building, 3 82-ft indoor ranges with 15 firing points each and 2 328-ft outdoor firing ranges with 15 and 30 firing points. The Firearms Training Environment includes a 68-space surface parking area. There is no proposed construction on Range 8; operational use is expected to increase as new users will be allowed access to the site.

Conservation Measures

Conservation measures are actions a Federal agency includes as an integral part of its proposed action and that are intended to avoid and minimize effects of the action on the listed species. These measures are synthesized from the 2014 BA and discussions between the Service and GSA.

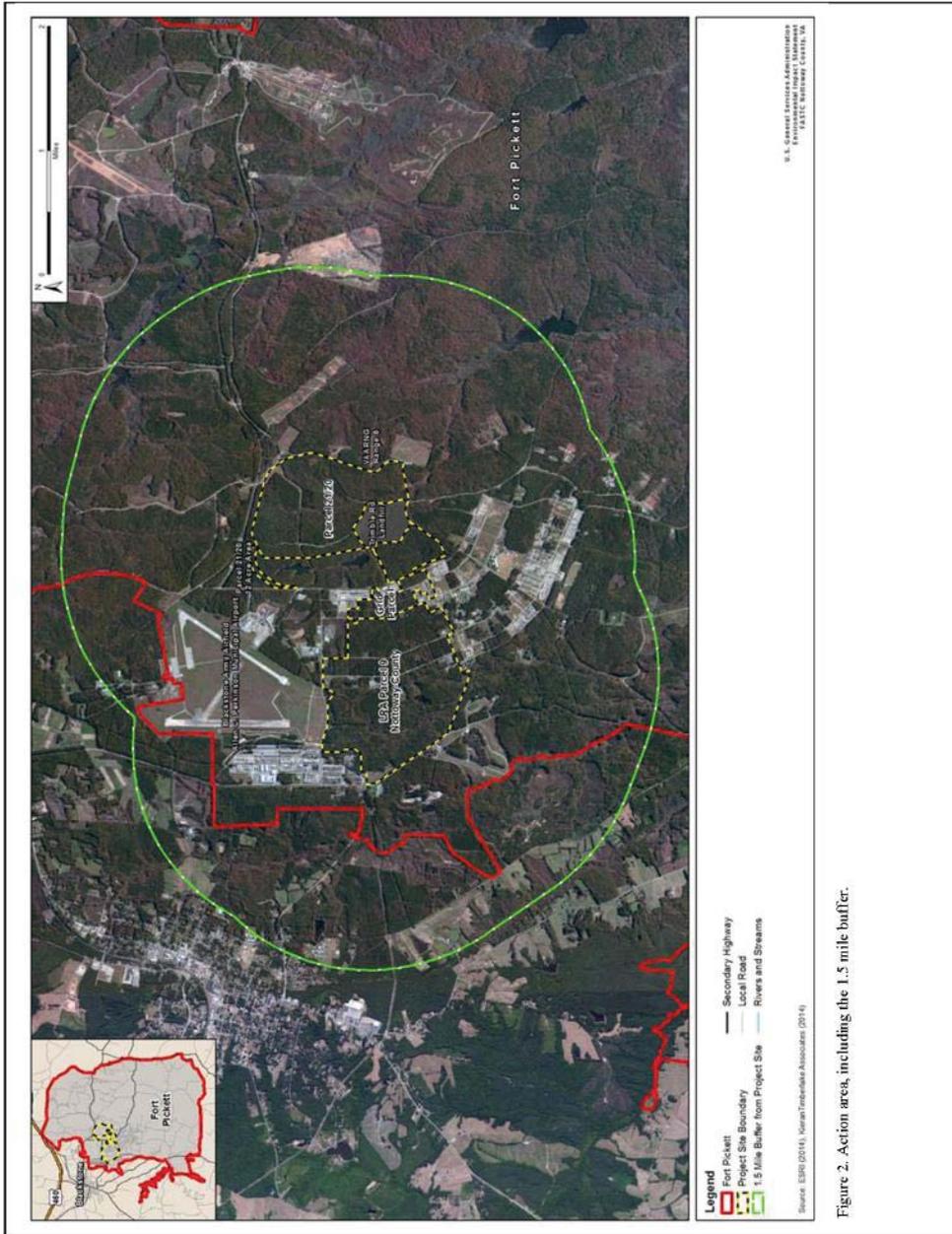
1. To avoid and minimize direct effects to female NLEBs (pregnant, lactating, and post-lactating) and juvenile NLEBs (non-volant and volant) during the summer maternity season (April 15 through September 15), site clearing (i.e., vegetation removal) for Packages 2, 3, 4, and 5 will be conducted October 1 through March 31. Under Package 1, approximately 9 acres of potential forested habitat will be cleared from August 1 through September 30, when pups are volant.
2. To maintain potential summer maternity habitat within the action area, where possible and not a safety hazard or an obstacle to project construction, dead or dying trees will be allowed to remain in the action area. Suitable NLEB roosts are trees (live, dying, dead, or snag) with a diameter at breast height of 3 inches or greater that exhibit any of the following characteristics: exfoliating bark, crevices, cavity, or cracks. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 ft from the next nearest suitable roost tree within a woodlot, or wooded fencerow (Service 2014a).
3. Existing vegetation will be preserved wherever possible. Areas that have been cleared for the proposed action, and will be landscaped after construction of proposed facilities, will be planted with native plant communities indigenous to the central Piedmont and woodland-edge vegetation (e.g., early successional trees, shrubs, and grasses) will be planted along disturbed edges. The reestablished plant communities will be tailored to the programmatic requirements of the training mission. These plantings will reestablish a natural edge to the forest, create corridors for wildlife movement, and prevent invasive species from establishing along disturbed edges. Approximately 180 acres of vegetation will be reestablished, of which approximately 87 acres will be forest. Approximately 10 acres of vegetation will be reestablished on Parcel 21/20 and 170 acres on LRA Parcel 9.

Mr. Vaughan

Page 6



Figure 1. Action area, venues, and land cover.



Mr. Vaughan

Page 8

4. The proposed action has incorporated wetland avoidance and impact minimization to the extent practicable during the planning phase. Project components have been sited as far upstream in the watersheds as possible to avoid and minimize impacts to larger perennial streams. All buildings and stormwater management facilities will be located outside of wetland limits.
5. In conjunction with final design, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared to avoid and minimize impacts to nearby surface waters. The SWPPP will include best management practices for erosion and sedimentation control, including techniques to diffuse and slow the velocity of stormwater to reduce potential impacts (e.g., soil loss and sedimentation) to water quality during construction. All construction site equipment servicing and maintenance areas will be at least 300 ft from waterbodies (e.g., wetlands, streams). All construction activities with the potential to impact water quality from runoff will be conducted in accordance with SWPPP requirements. GSA will provide the draft SWPPP to the Service for review and comment.
6. To the maximum extent practicable the following preventive measures will be implemented:
 - A. The perimeter of all areas to be disturbed during construction or maintenance activities will be clearly demarcated using flagging or temporary construction fence, and no disturbance outside that perimeter will be authorized. All access routes into and out of the proposed disturbance area will be flagged, and no construction travel outside those boundaries will be authorized. When available, areas disturbed by past activities or those used later in the construction period will be used for staging, parking, and equipment storage.
 - B. Materials such as gravel or topsoil will be obtained from existing developed or previously used sources, not from undisturbed areas adjacent to the property.
 - C. When vehicles or equipment are being refueled during construction, drip pans will be used underneath all construction equipment and containment zones will be established.
 - D. Non-hazardous waste material, litter, and other discarded materials, such as construction waste, will be contained in secured containers until removed from the construction site. All trash containers will have secured closures to prevent animal foraging.
7. To avoid and minimize importation of non-native plant and animal species onto the site, construction contractors will be required to inspect and clean all construction equipment and vehicles prior to any construction activity within the action area. All construction equipment and vehicles will be inspected to ensure that hydraulic fittings are tight, hydraulic hoses are in good condition and replaced if damaged, and there are no petroleum leaks.

Mr. Vaughan

Page 9

8. Wildfire prevention measures will be implemented, including restricting smoking to areas clear of vegetation, ensuring no fires of any kind are ignited, and equipping vehicles with spark arrestors and fire extinguishers.
9. Requirements for safe handling and disposal of hazardous wastes will be implemented.
10. To maintain and blend with the character of the surrounding rural environment, site lighting would be designed to meet local or Federal "Dark Sky" guidelines limiting nighttime light pollution and glare. Hooded lights will be used to the maximum extent practicable at all new roads and facilities within and adjacent to forest habitat. Illumination of forest will be kept to an absolute minimum.
11. All outdoor construction activities will be conducted during daylight hours in known or suitable summer habitat to avoid harassment of foraging NLEBs (April 15 through September 15).

Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The Service has determined that the action area for this project encompasses the 727-acre LRA Parcel 9, the 74-acre Grid Parcel, and the 549-acre Parcel 21/20, including the 12 acres between Parcel 21/20 and Dearing Avenue, 19 acres on Fort Pickett Range 8, and a 1.5-mile buffer (Figure 2) to encompass the area potentially affected by noise associated with proposed land-clearing and construction activities.

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE

On April 2, 2015 the Service listed the NLEB as threatened with an interim 4(d) rule (80 Federal Register 17973-18033). The Service indicated that critical habitat was not determinable under the ESA in the final rule. However, under the ESA, the Service has 1 year from the time a final listing rule is published to propose and determine appropriate critical habitat.

The species description, life history, population dynamics, status, and distribution are at: Griffin 1940, 1945; Mumford and Cope 1964; Barbour and Davis 1969; Stones and Branick 1969; Mills 1971; Cope and Humphrey 1972; Caire et al. 1979; Harvey et al. 1991; Harvey 1992; Nagorsen and Brigham 1993; Sasse and Perkins 1996; Callahan et al. 1997; Foster and Kurta 1999; Caceres and Barclay 2000; Lacki and Schwierjohann 2001; Menzel et al. 2002; Owen et al. 2002; Cmkovic 2003; Broders and Forbes 2004; Carter and Feldhamer 2005; Amelon and Burhans 2006; Perry and Thill 2007; Henderson and Broders 2008; WNS (white-nose syndrome) Science Strategy Report 2008; Blehert et al. 2009; Gargas et al. 2009; Johnson et al. 2009, 2012; Meteyer et al. 2009; Bouma et al. 2010; Center for Biological Diversity 2010; Frick et al. 2010; Kunz and Reichard 2010; Service 2010; Timpone et al. 2010; Dobony et al. 2011; Ford et al. 2011; Griencisen 2011; Lorch et al. 2011; Moore et al. 2011; Pucchmaille et al. 2011; Turner et al. 2011; Committee on the Status of Endangered Wildlife in Canada 2012; Hayes 2012; Langwig et al. 2012; Patriquin 2012; Maher et al. 2012; Ingersoll et al. 2013; Minnis and Lindner 2013; Moosman et al. 2013; NatureServe Explorer 2015; Youngbaer 2013; Federal

Mr. Vaughan

Page 10

Energy Regulatory Commission (FERC) 2014; GSA 2014; U.S. Geological Survey National Wildlife Health Center 2014; and Silvis et al. 2015.

ENVIRONMENTAL BASELINE

Status of the Species/Critical Habitat Within the Action Area – St. Germain (2006; 2014a, b) verified that NLEBs occur on Fort Pickett and in the action area. The bats appear to forage in the action area, but those surveys did not identify hibernacula, summer roosts, or maternity roosts in the action area. Otherwise, the viability of NLEB populations in the action area is unknown.

Factors Affecting Species Environment Within the Action Area – Because information about the distribution and abundance of NLEBs in the action area and Nottoway County is limited, the factors that affect NLEBs in the action area are uncertain. The landscapes and vegetation of Fort Pickett have been severely altered by a long history of clearing, agriculture, logging, and other anthropogenic disturbances.

Approximately 33,892 acres have been characterized as forested land within the boundary of Fort Pickett and over 3,000 acres have been characterized as grasslands and shrublands within the boundary of Fort Pickett (GSA 2015). Approximately 1,285 acres of that forestland and 112 acres of the grasslands and shrublands occur on the 3 parcels that represent the action area.

Vegetative cover on LRA Parcel 9 is dominated by early successional deciduous, coniferous, and mixed forests, although it is fragmented by existing roads, buildings, and utility corridors. Demolition activities and maintenance of roads and utility easements on this parcel have left tracts that are in early successional stages or are dominated by invasive and pioneer species.

Vegetative cover on the Grid Parcel consists of stands of early successional deciduous, coniferous and mixed forests similar to those described for Parcel 21/20 below, but they are more fragmented by roads and utility easements. Roadsides and utility easements on the parcel are maintained by frequent mowing and are dominated by invasive and pioneer species.

Vegetative cover on Parcel 21/20, which includes the 12 acres between Parcel 21/20 and Dearing Avenue, is dominated by deciduous, coniferous, and mixed forests. Coniferous forest tracts on this parcel are primarily pine plantations managed with silvicultural practices (GSA 2015). Roads in this parcel have fragmented this parcel into 6 separate forest blocks. The largest forest block on this parcel is approximately 174 acres and is located north of Butterwood Road and east of Trimble Road. The second largest block is located between the Trimble Road landfill and Dearing Avenue and is approximately 165 acres. The remaining forest blocks are all less than 150 acres. Firing range 8 is previously cleared, and remains an active firing range. The 1.5-mile buffer surrounding the site is comprised of deciduous, coniferous, mixed forests and some developed lots.

There are several known or potential sources of contaminants in the action area or immediately adjacent to it. A former salvage yard on the north central portion of LRA Parcel 9 was partially remediated to remove contaminants from the soil and groundwater. When the site was used as a recycling facility from the late 1940s through the 1960s used automobiles, metal containers,

crates, and debris were stored on the site. During the late 1960s and early 1970s the site was also used to bury demolition debris, scrap metal, and possibly paints, solvents, and petroleum based products. Immediately to the west of LRA Parcel 9 is a former fuel station whose soils have been reported to contain benzene, methyl tert-butyl ether, and chloroform (GSA 2015).

EFFECTS OF THE ACTION

Direct and Indirect Effects – Direct effects are the direct or immediate effects of the project on the species, its habitat, or designated/proposed critical habitat. Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02).

Vegetation Clearing

Construction of the FASTC is expected to affect approximately 1,381 acres. Of this total, approximately 407.1 acres will be cleared for venues and infrastructure (Table 2). Approximately 366 acres of forest cover (61.6 acres of deciduous forest, 153.6 acres of coniferous forest, and 148.8 acres of mixed forest) and approximately 5 acres of wetlands will be impacted permanently. The forest land to be cleared for construction represents approximately 28 percent of the 1,285 forested acres in the action area and less than 1 percent of the 33,892 forested acres on Fort Pickett.

Table 2. Estimates of the impacts of the proposed FASTC on different vegetated cover types in the action area. Data are in acres.

Vegetation type	Package					Total
	1	2	3	4	5	
Deciduous forest	1.1	5.7	40.5	13.3	0.8	61.4
Mixed forest	6.9	4.1	11.3	23.3	0.4	148.8
Coniferous forest	1.1	4.2	37.2	61.1	0	153.5
Bottomland forest	0	0	2.2	0	0	2.2
Total Forested Acreage	9.1	14	242.9	97.7	2.5	366.2
Shrub	0	0	1.8	0	0	1.9
Urban or range grass	1.6	0	29.2	5.7	0.3	36.8
Grassland or herbaceous cover	0	0	1.9	0.3	0.1	2.3
Non-Forested Acreage	1.6	0	32.9	6	0.4	40.9
Package total	10.7	14	275.8	103.7	2.9	407.1

The 10.7 acres of site clearing associated with Package 1 will impact approximately 9.1 acres of forest (1.1 acres of deciduous forest, 1.1 acres of coniferous forest, and 6.9 acres of mixed forest) and occur during the summer months when NLEBs occur in the action area. Approximately 341 acres of the forest cover to be cleared (approximately 93 percent of the total) is associated with Packages 3 and 4. Packages 2-5 are scheduled for clearing October 2015 through March 2016 and October 2016 through March 2017, when NLEBs do not occur in the action area.

GSA proposes to preserve existing vegetation wherever possible and will plant areas to be landscaped with native plant species indigenous to the central Piedmont. Woodland-edge

Mr. Vaughan

Page 12

vegetation (e.g., early successional trees, shrubs, and grasses) will be planted along disturbed edges and will be designed to prevent invasive species from becoming established along these edges. Overall, approximately 180 acres of vegetation will be re-established, including approximately 87 acres of forest. Approximately 10 acres of vegetation will be re-established on Parcel 21/20 and 170 acres will be re-established on LRA Parcel 9.

Tree clearing during construction will result in effects to NLEBs from: 1) summer season clearing if an occupied maternity or roost tree is felled and/or foraging habitat is removed and 2) winter season clearing if a maternity or roost tree is felled and/or foraging habitat is removed.

Summer Season Clearing

The 10.7 acres of site clearing associated with Package 1 will impact approximately 9.1 acres of forest. Of this 9.1-acre area, 1.6 and 0.4 acres of forested cover will be cleared in Parcel 21/20 to construct the Explosives Demonstrations Range and Live-Fire Shoot House, respectively. Vegetative cover on these 2 sites is previously disturbed forest adjacent to currently cleared areas. The remaining 7 acres of forested cover will be cleared in LRA Parcel 9 during late summer 2015 to construct the Mock-Urban Tactical Training Area, Rappel Tower, Tactical Maze, and Smoke House. A small area will also be cleared to construct the Tactical Training building. Tree clearing will occur during the summer months, mid-July to mid-September, when NLEBs are in the action area.

Given their small size and isolation and the absence of NLEB detections during surveys conducted in August 2014, clearing Explosives Demonstrations Range (1.6 acres) and Live-Fire Shoot House (0.4 acres) is not likely to affect roosting although it might reduce the amount of foraging habitat available to NLEBs.

Tree removal (7 acres in LRA Parcel 9) may impact non-maternity (males and non-reproductive females) and/or reproductive (females and juveniles) individuals. Effects to a maternity colony or roosting bats may occur if an undocumented maternity or roosting tree is removed. The maternity colony would need to shift trees and this might lead to a reduction in colony cohesion. Roosting bats could be injured or die from being crushed when the tree is felled or be more vulnerable to predation if they were flushed.

When trees are cleared, temporary and small-scale reductions in foraging opportunities may occur. NLEBs may seek foraging habitats farther away from the active disturbance area and may have to search potentially unfamiliar habitat for new foraging areas. This may result in increases in energetic demands and exposure to inter- and intra-specific competition, but changes in behavior are expected to be short-term.

Although bat surveys conducted on Fort Pickett have not identified summer roosts in the action area, to provide the benefit of the doubt to the species, the 7 acres of forested cover is assumed to contain suitable habitat for NLEB roosting and foraging. Based on Johnson (et al. 2012), the mean roost area of NLEBs in West Virginia is 31.13 acres (95 percent confidence interval [CI] = 13.8 to 48.5 acres), so the clearing of these 7 acres is expected to result in the loss of no more than 1 roost or approximately 5 bats (95 percent CI = 4 to 7). Because of its timing, mid-July to

Mr. Vaughan

Page 13

mid-September, these impacts are likely to avoid pregnant NLEBs or non-volant pups.

Winter Season Clearing

Site clearing associated with Packages 2, 3, 4, and 5 will result in clearing approximately 357 acres of forested cover and 41 acres of non-forested cover (Table 2). Approximately 257 acres of forest cover will be cleared between October 2015 and March 2016 in association with Packages 2 and 3. Approximately 100 acres of forested cover will be cleared between October 2016 and March 2017 in association with Packages 4 and 5.

Almost all of the 14 acres of forested cover cleared for Package 2 will occur on Parcel 21/20. Approximately 90 percent of the 243 acres of forested cover cleared for Package 3 will occur on LRA Parcel 9 and further fragment forest cover in this parcel. Approximately 93 acres of the forested cover cleared for Package 4 will occur in LRA Parcel 9 with approximately 5.3 acres cleared in Parcel 21/20.

Removal of maternity roost trees during the winter season renders them unavailable to pregnant bats that exhibit maternity area and/or maternity roost tree fidelity following migration in the spring. Periods of pregnancy, birth, and lactation are the most sensitive and energetically demanding times of year for reproductive females. If adequate primary and alternate maternity roosts are not available adjacent to the area of impact, pregnant females will have to search potentially unfamiliar habitat for new roosting and foraging areas. This may result in increases in energetic demands, exposure to inter- and intra-specific competition, and decreases in the long-term reproductive success and viability of the colony in the area. Impacts to non-reproductive individuals are similar; individuals would need to expend additional energy locating a new roost site. Their additional search time would increase their exposure to predation and would decrease foraging time until a replacement roost site has been located.

When trees are cleared, temporary and small-scale reductions in foraging opportunities may occur. NLEBs may seek foraging habitats farther away from the active disturbance area and may have to search potentially unfamiliar habitat for new foraging areas. This may result in increases in energetic demands, exposure to inter- and intra-specific competition, and exposure to predation while searching unfamiliar habitat, but changes in behavior are expected to be short-term.

As discussed, bat surveys conducted on Fort Pickett have not identified NLEB roosts in the action area. To provide the benefit of the doubt to the species, the 357 acres of forested cover to be cleared is assumed to contain suitable NLEB roosting or foraging habitat. To estimate the effect of this habitat loss on NLEBs, we used the following approach to estimate the number of NLEBs that will be affected by winter season vegetation clearing:

1. Data from surveys for NLEBs on Fort Pickett (St. Germain 2014a) was used to estimate the proportion of net sites in which NLEBs were present. We assumed the sites where St. Germain (2014a) detected NLEBs represent roosts. We also used meta-analyses to aggregate the Fort Pickett data and data from 10 surveys conducted in Virginia's

Appalachian Ecoregion (the Mountain Province) and West Virginia in case the St. Germain (2014a) data represented an outlier.

We conducted meta-analyses on these data to estimate the mean proportion of net sites (and 95 percent CI) that detected NLEBs. The meta-analyses used proportion as the measure of effect following the procedures described in Borenstein et al. (2009) and Cumming (2012).

2. The mean number of NLEBs reported in roosts (with accompanying 95 percent CI) was estimated from data from West Virginia published by Johnson et al. (2012) and Menzel et al. (2002).
3. The net sites estimated in Step 1 were multiplied by the proportion of those net sites in which NLEBs would be expected to be detected (Step 2). Specifically, to estimate the number of bats that might be affected at those roosts, we multiplied the number of sites St. Germain (2014) surveyed by the proportion of those sites with NLEB detections (32.26 percent; 95 percent CI – 18.57 to 49.86 percent) and multiplied the result by the mean number of bats expected per roost based on the studies from West Virginia. The result was assumed to represent the initial number of roosts expected to occur in the action area.
4. The results of Step 3 were multiplied by the mean number of NLEBs expected to occur in roosts. If we discount the potential effect of WNS on the NLEB population in the region, about 33 NLEBs (95 percent CI – 19 to 51) would be expected to lose portions of summer roosting habitat in the action area.
5. Because the survey data used in Step 2 were collected prior to WNS, the results of Step 4 were adjusted to account for the mean reduction in the number of NLEBs and their density caused by WNS. Adjusting for the probable effects of WNS on the NLEB in the region, 8 NLEBs (95 percent CI = 4 to 12) would lose a portion of their summer roosting habitat.

Scenarios J and K (see Table 3 for the assumptions associated with these and other scenarios) seem to be the most representative of the effect of WNS on NLEBs (Scenario J being consistent with the magnitude of the reduction reported by Reynolds, [personal communication 2014 *in* FERC 2014] and Scenario K representing the magnitude of decline reported by Francl et al. [2012]). Based on the St. Germain (2014a) data, we estimate that 8 NLEBs (95 percent CI – 2 to 12) will be affected as a result of reductions in summer roosting and foraging habitat.

Other Construction and Operational Activities

In addition to tree clearing, other stressors associated with construction and operational activities include: noise, nighttime lighting, collisions with vehicles, invasive species, and hazardous waste.

Mr. Vaughan

Page 15

Noise

Construction and operational activities will produce noise that will increase ambient sound levels in the action area. Construction is expected to generate noise in the vicinity of the action area and along U.S. 460, Cox Road, and Military Road where construction vehicles will travel to and from the site during daylight hours.

Testing of sounds at Fort Leonard Wood, MO determined that sounds from operation of heavy equipment (bulldozers and earth movers) generated frequencies up to 20 kilohertz (kHz), with peak frequencies less than 0.125 kHz (3D/International 1996). Although bats may hear sounds generated from equipment and vehicles, peak sound energy with most construction equipment is probably well below frequencies audible to bats (Montgomery Watson and 3D/International 1998).

Operational activities that will be sources of noise above ambient level include small-caliber weapons used at the 984-ft outdoor firing range proposed at the existing Fort Pickett Range. The small-caliber weapons are similar to those currently used at the Fort Pickett Range so peak noise levels are not expected to be higher than existing levels.

Noise levels expected from proposed operations at the explosive ranges will be dominated by the higher yield FASTC demolition operations using 2-3 pound NEW charges. Day-to-day operations include 2,783 smaller (4.5 grams to 1 pound NEW) detonations that will occur annually, but noise levels produced by these events will be limited to the local area and are not expected to exceed baseline noise levels.

The use of 3-pound NEW demolition charges is expected to occur a total of 18 times per year during the daytime, and the 2.23-pound NEW charges are expected to occur 36 times per year during the daytime. In addition, demolition charges generating the peak noise levels are expected to occur a total of 42 times per year during the daytime.

Results of investigation of the effects of sound at Fort Leonard Wood suggest that sound generated by training events (simulated artillery and small-arms fire) do not startle or frighten bats or cause them to flee the area affected by the sounds. Similar responses have been reported for Indiana bats foraging near active night training ranges at the Missouri facility during nighttime maneuvers (Service 1998) and for bats foraging and night-roosting at Fort Campbell, KY near an impact area (BHE Environmental, Inc. 2002). We anticipate that all noises discussed above will be short-term impacts that may affect breeding, feeding, and roosting behaviors and that NLEBs may avoid these areas until the disturbance ceases.

Nighttime Lighting

Nighttime lighting is not expected to adversely affect NLEBs because lighting on the site will be designed to meet local or Federal "Dark Sky" guidelines limiting nighttime light pollution and glare. Hooded lights will be used to the maximum extent practicable at all new roads and facilities within and adjacent to forest habitat. These measures are expected to prevent nighttime lighting from adversely affecting NLEBs within the action area.

Mr. Vaughan

Page 16

Collisions with Vehicles

The various venues for driving training pose a potential risk of vehicle collisions with NLEBs. Driver training operations will typically occur year round from 7 am to 10 pm with most operations occurring during daylight hours. As a result, the probability of a NLEB being struck by a vehicle is negligible.

Invasive Species

To prevent potentially invasive species from being introduced into the action area or spreading, all vehicles and other items used during construction and operational phases will be inspected by the contractor prior to arrival on site. Fill material that may be required will be sourced from onsite whenever possible and implementation of specific invasive species control procedures is expected to restrict the movement of invasive species within the action area. These measures are expected to prevent invasive species from adversely affecting NLEBs within the action area.

Hazardous Waste

Hazardous wastes produced by construction and operational activities will be managed on-site in accordance with applicable Federal, State, and local regulations. Hazardous waste will be prepared for transport in accordance with U.S. Department of Transportation regulations. Waste will be disposed of at approved treatment, storage, and disposal facilities and will be transported using appropriately licensed contractors. These measures are expected to prevent hazardous waste from adversely affecting NLEBs within the action area.

Interrelated and Interdependent Actions An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. The Service is not aware of activities interrelated to or interdependent with the proposed action at this time.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. The Service is not aware of any future State, tribal, local, or private actions within the action area at this time.

CONCLUSION

In addition to a small acreage of forested cover (9.1 acres) that will be cleared in mid-July to mid-September, approximately 357 acres of suitable NLEB habitat will be cleared after NLEBs migrate to their fall swarming habitat and/or hibernacula. We anticipate that summer tree clearing will cause the loss of 1 roost, but pregnant NLEBs and non-volant pups are not likely to be affected. Winter tree clearing will reduce the amount of summer roosting and foraging habitat

Mr. Vaughan

Page 17

available to bats when they migrate into the action area beginning in 2016. To minimize the long-term impacts of this habitat loss, approximately 180 acres of vegetation will be re-established, including approximately 87 acres of forest.

Although the FASTC will result in permanent (279.1 acres) and temporary (87 acres) loss of NLEB suitable habitat, the acreage affected represents approximately 28 percent of the potentially suitable foraging and roosting habitat for NLEBs in the three parcels that represent the action area and less than 1 percent of the potentially suitable habitat within Fort Pickett. Temporary and small-scale reductions in foraging or roosting opportunities for NLEBs may occur. NLEBs may change roosting or foraging areas and seek roosts and foraging habitats that are farther away from the active disturbance area, but changes in behavior are expected to be short-term. Although NLEBs exhibit fidelity to maternity roost areas, they appear to use networks of roosts arranged around a central node roost tree and switch between roosts in that network frequently during the summer. Given the ephemeral nature of roosts and the apparent relationship between roost network structure and roosting area, it seems likely that roosting areas could shift with roost loss.

We anticipate that noise from construction and operational activities will be short-term impacts that may affect breeding, feeding, and roosting behaviors and that NLEBs may avoid these areas until the disturbance ceases.

After reviewing the current status of the NLEB, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the FASTC, as proposed, is not likely to jeopardize the continued existence of the NLEB. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by GSA so that they become binding conditions of any grant or permit issued to GSA, as appropriate, for the exemption in section 7(o)(2) to apply. GSA has a continuing duty to regulate the activity covered

Mr. Vaughan

Page 18

by this incidental take statement. If GSA (1) fails to assume and implement the terms and conditions or (2) fails to require contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, GSA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service anticipates incidental take of NLEB will be difficult to detect for the following reasons:

1. Individuals are relatively small and occupy habitats where they are difficult to find;
2. Finding dead or injured specimens during or following project implementation is unlikely; and
3. Most incidental take will be non-lethal and undetectable.

The Service anticipates 5 NLEBs (95 percent CI = 4 to 7) could be taken as a result of vegetation clearing associated with Package 1 during the late summer and fall of 2015. The Service anticipates 8 NLEBs (95 percent CI = 2 to 12) could be taken as a result of winter season vegetation clearing. The Service anticipates 1 NLEB could be taken as a result of noise levels from proposed operations.

The estimate most consistent with available data indicates a total of 14 NLEBs (95 percent CI 6 to 19) will be incidentally taken as a result of summer and winter season vegetation clearing and noise. The incidental take is expected to be in the form of harm and harassment.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species. Critical habitat has not been proposed for this species.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the NLEB.

1. Minimize noise levels during construction.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the ESA, GSA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. Implement all practicable measures to reduce noise levels in the construction zone.
2. Operators, employees, and contractors associated with site preparation and construction of the FASTC must be educated on the biology of the NLEB, activities that may affect the NLEB, and ways to avoid and minimize these effects prior to working on site.
3. Provide an annual report summarizing the acres of trees cleared, timeframe in which they were cleared, and forest cover type no later than December 31 of each year until all construction and vegetation planting is complete. A final digital report of the total acreage cleared and the forest type cleared should be sent to the Service via the contact email provided below.
4. Care must be taken in handling any dead specimens of proposed or listed species to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service's Virginia Law Enforcement Office at 804-771-2883 and the Service's Virginia Field Office at 804-693-6694.

The Service believes that no more than 14 NLEBs will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- Support research or survey efforts that aid in the understanding of how GSA-authorized projects impact the NLEB. This research could inform the development of best management practices to be incorporated into project plans to minimize impacts to NLEBs and assist with the species' conservation.

Mr. Vaughan

Page 20

- Pursue acquisition of parcels or easements to protect NLEB roosting and foraging habitat.

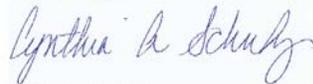
For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions, please contact Sumalee Hoskin of this office at (804) 824-2414, or via email at Sumalee_Hoskin@fws.gov.

Sincerely,



Cindy Schulz
Field Supervisor
Virginia Ecological Services

cc: Corps, Norfolk, VA (Attn: Tom Walker)
U.S. Army National Guard, Arlington, VA (Attn: Jay Rubinoff)
VDCR, DNH, Richmond, VA (Attn: René Hypes)
VDGIF, Richmond, VA (Attn: Rick Reynolds)

Table 3. Scenarios used to estimate the number of NLEBs affected by the Project. The estimated number of Northern long-eared bat exposed to habitat loss caused by land clearing for the proposed Foreign Affairs Security Training Center results from the following formula: *(Estimated # of Survey Sites from St. Germain)*(Mean Proportion of Survey Sites with Potential Roosts)*(Mean Number of NLEB Roosts)*(Percent Reduction in NLEB Density Given White-Nose Syndrome)*. The mean estimate is considered the "best" or "most likely" estimate, but upper and lower 95% CI are also provided. The number of sites St. Germain (2014) surveyed was reduced from 21 to 20 because one survey site would be cleared during the summer roosting period; those impacts were estimated separately. The first group of estimates (1A to 1K) relies on proportions derived from 12 studies in West Virginia and Virginia. The second group of estimates (2A to 2K) relies on proportions derived from St. Germain (2014) for Fort Pickett. Mean number of bats/roost is from Johnson et al. (2012) (see worksheet); adjustments for white-nose syndrome are based on the studies identified in the scenario description (see text for further explanation of the methodology).

Scenario	Estimated No. Blocks	Mean Proportion of Blocks w/ Roosts (Unadjusted)	Upper 95% CI Proportion of Blocks w/ Roosts (Unadjusted)	Lower 95% CI Proportion of Blocks w/ Roosts (Unadjusted)	Mean No. Bats/Roost	Adjust for WNS (mean % reduction in density)	Estimated # NLEBs Exposed (Mean)	Estimated # NLEBs Exposed (U 95% CI)	Estimated # NLEBs Exposed (L 95% CI)
A Uncorrected for WNS	20	0.3226	0.4986	0.1857	5.1	0.0	33	51	19
B Corrected for WNS (10% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.1	30	46	17
C Corrected for WNS (20% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.2	26	41	15
D Corrected for WNS (30% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.3	23	36	13
E Corrected for WNS (40% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.4	20	31	11
F Corrected for WNS (50% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.5	16	25	9
G Corrected for WNS (60% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.6	13	20	8
H Corrected for WNS (70% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.7	10	15	6
I Corrected for WNS (80% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.8	7	10	4
J Corrected for WNS (90% reduction in NLEB abundance/density)	20	0.3226	0.4986	0.1857	5.1	0.9	3	5	2
K Corrected for WNS (NLEB capture rates are 22.9% of historic rates from Francl et al. 2012)	20	0.3226	0.4986	0.1857	5.1	0.8	8	12	4

Mr. Vaughan

Page 22

Literature Cited

- 3D/International, Inc. 1996. Biological assessment of the master plan and ongoing mission, U.S. Army Engineer Center and Fort Leonard Wood. Prepared for Kansas City Corps of Engineers.
- Amelon, S. and D. Burhans. 2006. Conservation assessment: *Myotis septentrionalis* (northern long-eared bat) in the eastern United States. Pages 69-82 in Thompson, F. R., III, editor. Conservation assessments for five forest bat species in the eastern United States. U.S. Department of Agriculture, Forest Service, North Central Research Station, General Technical Report NC-260. St. Paul, MN.
- Barbour, R.W. and W.H. Davis. 1969. Bats of America. The University of Kentucky Press; Lexington, KY.
- BHE Environmental, Inc. 2002. Radiotelemetry study, endangered bats, Fort Campbell, Kentucky and Tennessee. Unpublished report prepared for the U.S. Army Engineer District, Kansas City, Missouri and submitted to the Fort Campbell Public Works Business Center, Environmental Division. Fort Campbell, KY.
- Blehert, D.S., A.C. Hicks, M. Beltr, C.U. Meteyer, B.M. Berlowski-Zier, E.L. Buckles, J.T.H. Coleman, S.R. Darling, A. Gargas, R. Niver, J.C. Okoniewski, R.J. Rudd, and W.B. Stone. 2009. Bat white-nose syndrome: an emerging fungal pathogen? *Science* 323:227.
- Borenstein, M., L.V. Hedges, J.P.T. Higgins, and H.R. Rothstein. 2009. Introduction to meta-analysis. John Wiley and Sons, Limited, West Sussex, UK.
- Bouma H.R., H.V. Carey, and F.G. Kroese. 2010. Hibernation: the immune system at rest? *Journal of Leukocyte Biology* 88:619-624.
- Broders, H.G. and G.J. Forbes. 2004. Interspecific and intersexual variation in roost-site selection of northern long-eared and little brown bats in the Greater Fundy National Park ecosystem. *Journal of Wildlife Management* 68:602-610.
- Caceres, M.C. and R.M.R. Barclay. 2000. *Myotis septentrionalis*. *Mammalian Species* No. 634:1-4.
- Caire, W., R.K. LaVal, M.L. LaVal, and R. Clawson. 1979. Notes on the ecology of *Myotis keenii* (Chiroptera, Vespertilionidae) in Eastern Missouri. *American Midland Naturalist* 102:404-407.
- Callahan, E.V., R.D. Drobney, and R.L. Clawson. 1997. Selection of summer roosting sites by Indiana bats (*Myotis sodalis*) in Missouri. *Journal of Mammalogy* 78:818-825.

Mr. Vaughan

Page 23

- Carter, T.C. and G. Feldhamer. 2005. Roost tree use by maternity colonies of Indiana bats and northern long-eared bats in southern Illinois. *Forest Ecology and Management* 219:259-268.
- Center for Biological Diversity. 2010. Petition to list the eastern-small footed bat *Myotis leibii* and northern long-eared bat *Myotis septentrionalis* as threatened or endangered under the Endangered Species Act. Richmond, VT.
- Committee on the Status of Endangered Wildlife in Canada. 2012. Technical summary and supporting information for an emergency assessment of the Northern Myotis *Myotis septentrionalis*. Environmental Canada, Committee on the Status of Endangered Wildlife in Canada, Terrestrial Mammal Subcommittee, Gatineau, Quebec, Canada.
- Cope, J.B. and S.R. Humphrey. 1972. Reproduction of the bats *Myotis keenii* and *Pipistrellus subflavus* in Indiana. *Bat Research News* 13:9-10.
- Crnkovic, A.C. 2003. Discovery of northern long-eared Myotis, *Myotis septentrionalis* (Chiroptera: Vespertilionidae), in Louisiana. *The Southwestern Naturalist* 48:715-717.
- Cumming, G. 2012. Understanding the new statistics: effect sizes, confidence intervals, and meta-analysis. Routledge, New York, NY.
- Dobony, C.A., A.C. Hicks, R.I. von Linden, J.C. Okoniewski, and R.E. Rainbolt. 2011. Little brown myotis persist despite exposure to white-nose syndrome. *Journal of Fish and Wildlife Management* 2:190-195.
- FERC. 2014 Supplemental biological assessment for Transcontinental Gas Pipe Line Company, LLC. Virginia Southside Expansion Project. FERC Docket No. CP13-30-000. July.
- Ford, W.M., E.R. Britzke, C.A. Dobony, J.L. Rodrigue, and J.B. Johnson. 2011. Patterns of acoustical activity of bats prior to and following white-nose syndrome occurrence. *Journal of Fish and Wildlife Management* 2:125-134.
- Foster, R.W. and A. Kurta. 1999. Roosting ecology of the Northern bat (*Myotis septentrionalis*) and comparisons with the endangered Indiana bat (*Myotis sodalis*). *Journal of Mammalogy* 80:659-672.
- Franel, K.E., W.M. Ford, D.W. Sparks, and V. Brack. 2012. Capture and reproductive trends in summer bat communities in West Virginia: assessing the impact of White-Nose Syndrome. *Journal of Fish and Wildlife Management* 3:33-42.
- Frick, W.F., J.F. Pollock, A.C. Hicks, K.E. Langwig, D.S. Reynolds, G.G. Turner, C.M. Butchkoski, and T.H. Kunz. 2010. An emerging disease causes regional population collapse of a common North American bat species. *Science* 329:679-682.

Mr. Vaughan

Page 24

- Gargas, A., M.T. Trest, M. Christensen, T.J. Volk, and D.S. Blehert. 2009. *Geomyces destructans* sp. nov. associated with bat white-nose syndrome. *Mycotaxon* 108:147-154.
- General Services Administration. 2012. Draft Environmental Impact Statement for U.S. Department of State Foreign Affairs Security Training Center Nottoway County, Virginia. GSA Mid-Atlantic Region; Philadelphia, PA. October.
- General Services Administration. 2014. Biological assessment on the potential effects on species under the jurisdiction of the U.S. Fish and Wildlife Service from construction and operation of a proposed U.S. Department of State, Bureau of Diplomatic Security Foreign Affairs Security Training Center, Nottoway County, Virginia. GSA Mid-Atlantic Region; Philadelphia, PA. December 23.
- General Services Administration. 2015. Supplemental Draft Environmental Impact Statement for U.S. Department of State Foreign Affairs Security Training Center Nottoway County, Virginia. GSA Mid-Atlantic Region; Philadelphia, PA. January.
- Grieneisen, L.E. 2011. Hibernacula microclimate and white-nose syndrome susceptibility in the little brown myotis (*Myotis lucifugus*). Master's Thesis. Bucknell University, Lewisburg, PA.
- Griffin, D.R. 1940. Reviewed notes on the life histories of New England cave bats. *Journal of Mammalogy* 21:181-187.
- Griffin, D.R. 1945. Travels of banded cave bats. *Journal of Mammalogy* 26:15-23.
- Harvey, M.J. 1992. Bats of the eastern United States. Arkansas Game & Fish Commission, 46pp.
- Harvey, M.J., J.R. MacGregor, and R.R. Currie. 1991. Distribution and status of Chiroptera in Kentucky and Tennessee. *Journal of the Tennessee Academy of Science* 66:191-193.
- Hayes, M. 2012. The *Geomyces* fungi: ecology and distribution. *Bioscience* 62:819-823.
- Henderson, L.E and H.G. Broders. 2008. Movements and resource selection of the northern long-eared myotis (*Myotis septentrionalis*) in a forest-agriculture landscape. *Journal of Mammalogy* 89:952-963.
- Ingersoll, T.E., B.J. Sewell, and S.K. Amelon. 2013. Improved analysis of long-term monitoring data demonstrates marked regional declines of bat populations in the eastern United States. *PLoS One* 8:1-13.
- Johnson, J.B., W.M. Ford, and J.W. Edwards. 2012. Roost networks of northern myotis (*Myotis septentrionalis*) in a managed landscape. *Forest Ecology and Management* 266:223-231.

Mr. Vaughan

Page 25

- Johnson, J.B., J.E. Gates, and W.M. Ford. 2009. Notes on foraging activity of female *Myotis leibii* in Maryland. Research Paper NRS-8. U.S. Department of Agriculture, Forest Service, Northern Research Station, Newtown Square, PA.
- Kerth G. and J. Van Schaik. 2011. Causes and consequences of living in closed societies: lessons from a long-term socio-genetic study on Bechstein's bats. *Molecular Ecology* 21: 633-646.
- Kunz, T.H. and L.F. Lumsden. 2003. Ecology of cavity and foliage roosting bats. In: Kunz, T.H., Fenton, M.B. (Eds.), *Bat Ecology*. University of Chicago Press, Chicago, pp. 3-89.
- Kunz, T.H. and J.D. Reichard. 2010. Status review of the little brown myotis (*Myotis lucifugus*) and determination that immediate listing under the endangered species act is scientifically and legally warranted. Boston University's Center for Ecology and Conservation Biology, Boston, MA.
- Lacki, M.J. and J.H. Schwierjohann. 2001. Day-roost characteristics of Northern bats in mixed mesophytic forest. *Journal of Wildlife Management* 65:482-488.
- Langwig, K.E., W.F. Frick, J.T. Bried, A.C. Hicks, T.H. Kunz, and A.M. Kilpatrick. 2012. Sociality, density-dependence and microclimates determine the persistence of populations suffering from a novel fungal disease, white-nose syndrome. *Ecology Letters* 15:1050-1057.
- Lorch, J.M., C.U. Meteyer, M.J. Behr, J.G. Boyles, P.M. Cryan, A.C. Hicks, A.E. Ballmann, J.T.H. Coleman, D.N. Redell, D.M. Reeder, and D.S. Blehert. 2011. Experimental infection of bats with *Geomyces destructans* causes white-nose syndrome. *Nature* 480:376-379.
- Maher, S.P., A.M. Kramer, J.T. Pulliam, M.A. Zokan, S.E. Bowden, H.D. Barton, K. Magori, and J.M. Drake. 2012. Spread of white-nose syndrome on a network regulated by geography and climate. *Nature Communications* 3:1306.
- Menzel, M.A., S.F. Owen, W.M. Ford, B.R. Chapman, K.V. Miller, J.E. Edwards, and P.B. Wood. 2002. Roost tree selection by maternity colonies of Northern long-eared bats (*Myotis septentrionalis*) in an industrial forest of the central Appalachian Mountains. *Forest Ecology and Management* 155:107-114.
- Meteyer, C.U., E.L. Buckles, D.S. Blehert, A.C. Hicks, D.E. Green, V. Shearn-Bochsler, N.J. Thomas, A. Gargas, and M.J. Behr. 2009. Histopathologic criteria to confirm white-nose syndrome in bats. *Journal of Veterinary Diagnostic Investigation* 21:411-414.
- Mills, R.S. 1971. A concentration of *Myotis keenii* at caves in Ohio. *Ohio Journal of Mammalogy* 52:625.

Mr. Vaughan

Page 26

- Minnis, A.W. and D.L. Lindner. 2013. Phylogenetic evaluation of *Geomyces* and allies reveals no close relatives of *Pseudogymnoascus destructans*, comb. nov., in bat hibernacula of eastern North America. *Fungal Biology* 117:638–649.
- Montgomery Watson and 3D/International, Inc. 1998. Biological assessment: effects to Indiana bats and bald eagles from construction and operation of the proposed multi-purpose training range: Atterbury Reserve Forces Training Area, Edinburgh, Indiana.
- Moore, M.S., J.D. Reichard, T.D. Murtha, B. Zahedi, R.M. Fallier, and T.H. Kunz. 2011. Specific alterations in complement protein activity of little brown myotis (*Myotis lucifugus*) hibernating in white-nose syndrome affected sites. *PLoS ONE* 6:e27430.
- Moosman, P.R., J.P. Veilleux, G.W. Pelton, and H.H. Thomas. 2013. Changes in capture rates in a community of bats in New Hampshire during the progression of white-nose syndrome. *Northeastern Naturalist* 20:552–558.
- Mumford, R.E. and J.B. Cope. 1964. Distribution and status of the Chiroptera of Indiana. *American Midland Naturalist* 72:473–489.
- Nagorsen, D.W. and R.M. Brigham. 1993. The Mammals of British Columbia. 1. Bats. Royal British Columbia Museum, Victoria, and the University of British Columbia Press, Vancouver.
- NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, VA. Available <http://explorer.natureserve.org>. (Accessed: April 29, 2015).
- Owen, S.F., M.A. Menzel, W.M. Ford, J.W. Edwards, B.R. Chapman, K.V. Miller, and P.B. Wood. 2002. Roost tree selection by maternal colonies of Northern long-eared myotis in an intensively managed forest. USDA Forest Service. Newtown Square, PA.
- Patriquin, K.J. 2012. The causes and consequences of fission-fusion dynamics in female northern long-eared bats (*Myotis septentrionalis*). Doctoral Dissertation. Dalhousie University, Halifax, Nova Scotia.
- Perry, R.W. and R.E. Thill. 2007. Roost selection by male and female northern long-eared bats in a pine-dominated landscape. *Forest Ecology and Management* 247:220-226.
- Puechmaille, S.J., W.F. Frick, T.H. Kunz, P.A. Racey, C.C. Voigt, G. Wibbelt, and E.C. Teeling. 2011. White-nose syndrome: is this emerging disease a threat to European bats? *Trends in Ecology and Evolution* 26:570–576.
- Sasse, D.B. and P.J. Pekins. 1996. Summer roosting ecology of northern long-eared bats (*Myotis septentrionalis*) in the White Mountain National Forest. Pages 91-101 in *Bats and Forests Symposium*, October 1995. Victoria, British Columbia, Canada.

Mr. Vaughan

Page 27

- Silvis, A., A.B. Kniewski, S.D. Gehrt, and W.M. Ford. 2014. Roosting and foraging social structure of the endangered Indiana bat (*Myotis sodalis*). PLoS ONE 9:e96937.
- Silvis, A., W.M. Ford, and E.R. Britzke. 2015. Effects of hierarchical roost removal on northern long-eared bat (*Myotis septentrionalis*) maternity colonies. PLoS ONE 10:e0116356.
- St. Germain, M.J. 2006. Bat species assemblage at Fort Pickett, Blackstone, Virginia. Report CMI-MLD R-59 20070718. Conservation Management Institute – Military Lands Division, College of Natural Resources, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- St. Germain, M.J. 2014a. Bat acoustic and mist netting surveys for the proposed U.S. Department of State Foreign Affairs Security Training Center Nottoway County, Virginia. Prepared by Conservation Management Institute, College of Natural Resources and Environment, Virginia Polytechnic Institute and State University, Blacksburg, VA for Cardno, Middletown, CT.
- St. Germain, M.J. 2014b. Bats of Fort Pickett, Blackstone, Virginia. Report No. CMI-MLD R-67 20080101, Conservation Management Institute-Military Lands Division, College of Natural Resources and Environment, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- Stones, R.C. and L.P. Branick. 1969. Use of hearing in homing by two species of *Myotis* bats. Journal of Mammalogy 50(1):157-160.
- Timpone, J.C., J.G. Boyles, K.L. Murray, D.P. Aubrey, and L.W. Robbins. 2010. Overlap in roosting habits of Indiana Bats (*Myotis sodalis*) and northern bats (*Myotis septentrionalis*). American Midland Naturalist 163:115-123.
- Turner, G.G., D.M. Reeder, and J.T.H. Coleman. 2011. A five-year assessment of mortality and geographic spread of white-nose syndrome in North American bats and a look to the future. Bat Research News 52(2):13–27.
- U.S. Fish and Wildlife Service. 1998. Biological opinion on the construction and operation of the Multi-Purpose Training Range (MPTR) at the Camp Atterbury Army National Guard Training Site, Edinburgh, Indiana. Bloomington Field Office, Bloomington, IN.
- U.S. Fish and Wildlife Service. 2010. A national plan for assisting states, federal agencies, and tribes in managing white-nose syndrome in bats (draft). Available at: http://www.fws.gov/WhiteNoseSyndrome/pdf/WNSNational%20Plan_DRAFT_10.21.2010.pdf.
- U.S. Fish and Wildlife Service. 2014a. Northern long-eared bat interim conference and planning guidance. USFWS Regions 2, 3, 4, 5, & 6. U.S. Department of the Interior. U.S. Fish and Wildlife Service; Washington, DC. January 6.

Mr. Vaughan

Page 28

U.S. Geological Survey National Wildlife Health Center. 2014. Letter (dated 29 April 2014) to Oklahoma Department of Wildlife Conservation re: Reference Case Number 23042, Cave bat (*Myotis velifer*), Woodward County, Oklahoma. Madison, WI.

Watson, M. and 3D/International, Inc. 1998. Biological assessment: effects to Indiana bats and bald eagles from construction and operation of the proposed multi-purpose training range: Atterbury Reserve Forces Training Area, Edinburgh, IN.

WNS Science Strategy Report. 2008. Questions, observations, hypotheses, predictions, and research needs for addressing effects of white-nose syndrome (WNS) in hibernating bats. Available at: <http://batcon.org/pdfs/WNSMtgRptFinal2.pdf>.

Willis, C.K.R. and R.M. Brigham. 2004. Roost switching, roost sharing and social cohesion: forest-dwelling big brown bats, *Eptesicus fuscus*, conform to the fission-fusion model. *Animal Behavior* 68: 495-505.

Youngbaer, P. 2013. White Nose Syndrome 2013: "Got Bats"? National Speleological Society News April 2013:7-11.