



Fort Liberty, North Carolina

US Army Corps
Of Engineers
Savannah District

Solicitation Number

W912HN-24-B-3002

Automated Multipurpose Training Range (MPTR)

Volume 3 of 3: Appendices

PN 96182

November 2023

**U.S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
100 WEST OGLETHORPE AVENUE
SAVANNAH, GEORGIA 31401-3640**

PROJECT TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01 11 00	SUMMARY OF WORK
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 32 01.00 10	PROJECT SCHEDULE
01 33 00	SUBMITTAL PROCEDURES
01 33 29	SUSTAINABILITY REQUIREMENTS AND REPORTING
01 35 26	GOVERNMENTAL SAFETY REQUIREMENTS
01 42 00	SOURCES FOR REFERENCE PUBLICATIONS
01 45 00.00 10	QUALITY CONTROL
01 45 00.15 10	RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
01 45 35	SPECIAL INSPECTIONS
01 45 50	LINE OF SIGHT VERIFICATION
01 50 00	TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 19	TEMPORARY ENVIRONMENTAL CONTROLS
01 58 00	PROJECT IDENTIFICATION
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 78 00	CLOSEOUT SUBMITTALS
01 78 23	OPERATION AND MAINTENANCE DATA

DIVISION 03 - CONCRETE

03 30 00	CAST-IN-PLACE CONCRETE
----------	------------------------

DIVISION 04 - MASONRY

04 20 00	UNIT MASONRY
----------	--------------

DIVISION 05 - METALS

05 05 23.16	STRUCTURAL WELDING
05 12 00	STRUCTURAL STEEL
05 30 00	STEEL DECKS
05 40 00	COLD-FORMED METAL FRAMING
05 50 13	MISCELLANEOUS METAL FABRICATIONS
05 51 00	METAL STAIRS
05 51 40	METAL BLEACHERS
05 52 00	METAL RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	ROUGH CARPENTRY
06 20 00	FINISH CARPENTRY
06 61 16	SOLID SURFACING FABRICATIONS

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 22 00	ROOF AND DECK INSULATION
07 27 10.00 10	BUILDING AIR BARRIER SYSTEM
07 27 19.01	SELF-ADHERING AIR BARRIERS
07 27 26	FLUID-APPLIED MEMBRANE AIR BARRIERS
07 31 13	ASPHALT SHINGLES
07 42 13	METAL WALL PANELS
07 60 00	FLASHING AND SHEET METAL
07 61 14.00 20	STEEL STANDING SEAM ROOFING
07 84 00	FIRESTOPPING
07 92 00	JOINT SEALANTS

DIVISION 08 - OPENINGS

08 11 13 STEEL DOORS AND FRAMES
08 14 00 WOOD DOORS
08 33 23 OVERHEAD COILING DOORS
08 51 13 ALUMINUM WINDOWS
08 71 00 DOOR HARDWARE
08 81 00 GLAZING

DIVISION 09 - FINISHES

09 06 00 SCHEDULES FOR FINISHES
09 22 00 SUPPORTS FOR PLASTER AND GYPSUM BOARD
09 29 00 GYPSUM BOARD
09 51 00 ACOUSTICAL CEILINGS
09 65 00 RESILIENT FLOORING
09 90 00 PAINTS AND COATINGS

DIVISION 10 - SPECIALTIES

10 22 39 FOLDING PANEL PARTITIONS
10 44 16 FIRE EXTINGUISHERS

DIVISION 12 - FURNISHINGS

12 21 00 WINDOW BLINDS

DIVISION 21 - FIRE SUPPRESSION

21 21 00 FIRE EXTINGUISHING SPRINKLER SYSTEMS (RESIDENTIAL)

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 03 00.00 20 BASIC MECHANICAL MATERIALS AND METHODS
23 05 15 COMMON PIPING FOR HVAC
23 05 48.19 BRACING FOR HVAC
23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS
23 09 00 INSTRUMENTATION AND CONTROL FOR HVAC
23 09 13 INSTRUMENTATION AND CONTROL DEVICES FOR HVAC
23 23 00 REFRIGERANT PIPING
23 30 00 HVAC AIR DISTRIBUTION
23 81 00 DECENTRALIZED UNITARY HVAC EQUIPMENT
23 82 46.00 40 ELECTRIC UNIT HEATERS

DIVISION 25 - INTEGRATED AUTOMATION

25 05 11 CYBERSECURITY FOR FACILITY-RELATED CONTROL SYSTEMS
25 05 11.21 CYBERSECURITY FOR FIRE ALARM CONTROL SYSTEMS

DIVISION 26 - ELECTRICAL

26 20 00 INTERIOR DISTRIBUTION SYSTEM
26 28 01.00 10 COORDINATED POWER SYSTEM PROTECTION
26 41 00 LIGHTNING PROTECTION SYSTEM
26 51 00 INTERIOR LIGHTING
26 56 00 EXTERIOR LIGHTING

DIVISION 27 - COMMUNICATIONS

27 10 00 BUILDING TELECOMMUNICATIONS CABLING SYSTEM

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 31 70 INTERIOR FIRE ALARM SYSTEM, ADDRESSABLE

DIVISION 31 - EARTHWORK

31 00 00 EARTHWORK
31 05 19.13 GEOTEXTILES FOR EARTHWORK
31 11 00 CLEARING AND GRUBBING
31 31 16.13 CHEMICAL TERMITE CONTROL

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 01 19.61 SEALING OF JOINTS IN RIGID PAVEMENT
32 11 23 AGGREGATE BASE COURSES
32 13 13.06 PORTLAND CEMENT CONCRETE PAVEMENT FOR ROADS AND SITE
FACILITIES
32 16 19 CONCRETE CURBS, GUTTERS AND SIDEWALKS
32 31 13.53 HIGH-SECURITY FENCES (CHAIN LINK AND ORNAMENTAL) AND GATES
32 32 23.13 SEGMENTAL CONCRETE BLOCK RETAINING WALL
32 92 19 SEEDING

DIVISION 33 - UTILITIES

33 40 00 STORMWATER UTILITIES
33 46 16 SUBDRAINAGE PIPING
33 48 00 BIORETENTION AREAS
33 71 02 UNDERGROUND ELECTRICAL DISTRIBUTION
33 82 00 TELECOMMUNICATIONS OUTSIDE PLANT (OSP)

APPENDICES

APPENDIX A STANDARD FORMS
APPENDIX B ENVIRONMENTAL INFORMATION

-- End of Project Table of Contents --

APPENDIX A

STANDARD FORMS

APPENDIX A - STANDARD FORMS

LIST OF FORMS

Fort Bragg Project Sign
Project Sign Legend Defined
Project Sign Erection Detail
Safety Performance Sign
Corps of Engineers Logo
Accident Prevention Plan Checklist
Construction Quality Control Report
Weekly Temporary Electrical Inspection
Minimum Standard for Temporary Electrical Service (Ref. FAR 52.236-14)
SAS FL 363 - Foundation Data
SAS Form 9 - Activity Hazard Analysis
SAD FL198 - Report of Safety Meeting
DA Form 5418-R - Cost Estimate Analysis
DD Form 1354 - Transfer and Acceptance of Military Real Property
DD Form 1354 Checklist
DD Form 1532 - Pest Management Report
DD Form 1532 - Pest Management Maintenance Record
DHS Form I-9 - Employment Eligibility Verification
ENG Form 16-1 - Certificate of Compliance for LHE and Rigging
ENG Form 16-2 - Standard Pre-Lift Plan (LHE)/Checklist
ENG Form 16-3 - Critical Lift Plan
ENG Form 2454 - Construction Progress Chart
ENG Form 3394 - Accident Investigation Report
ENG Form 4025 - Transmittal of Shop Drawings, Equipment Data, Material
Samples, or Manufacturer's Certificates of Compliance
Real Property Inventory and BIS Worksheet
Fort Bragg Form 1605 - Directorate of Engineering and Housing Excavation
Permits
Fort Bragg Asbestos Removal, Transportation, and Disposal

APPENDIX A - STANDARD FORMS

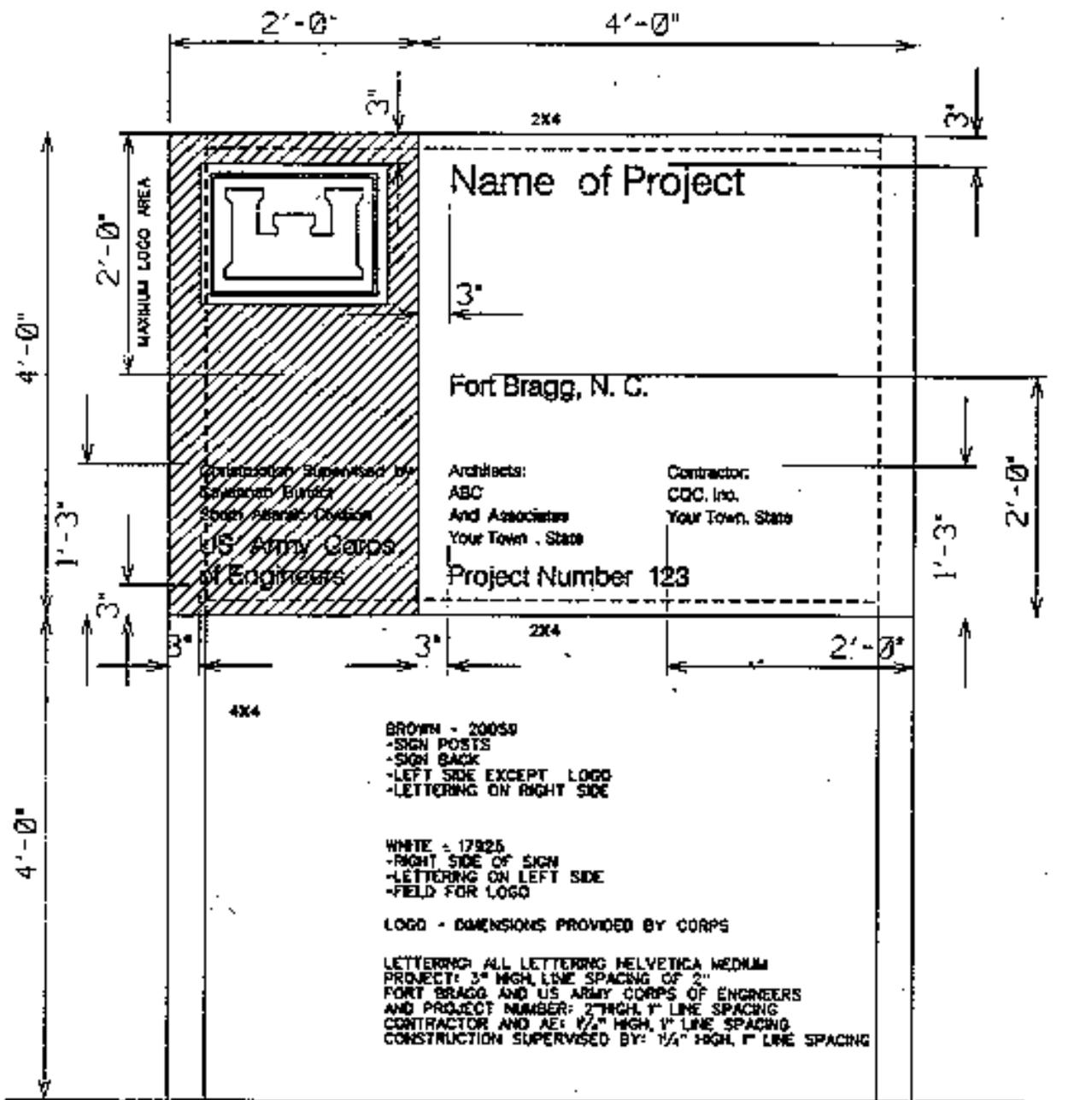
LIST OF FORMS

Fort Bragg Access Request Form

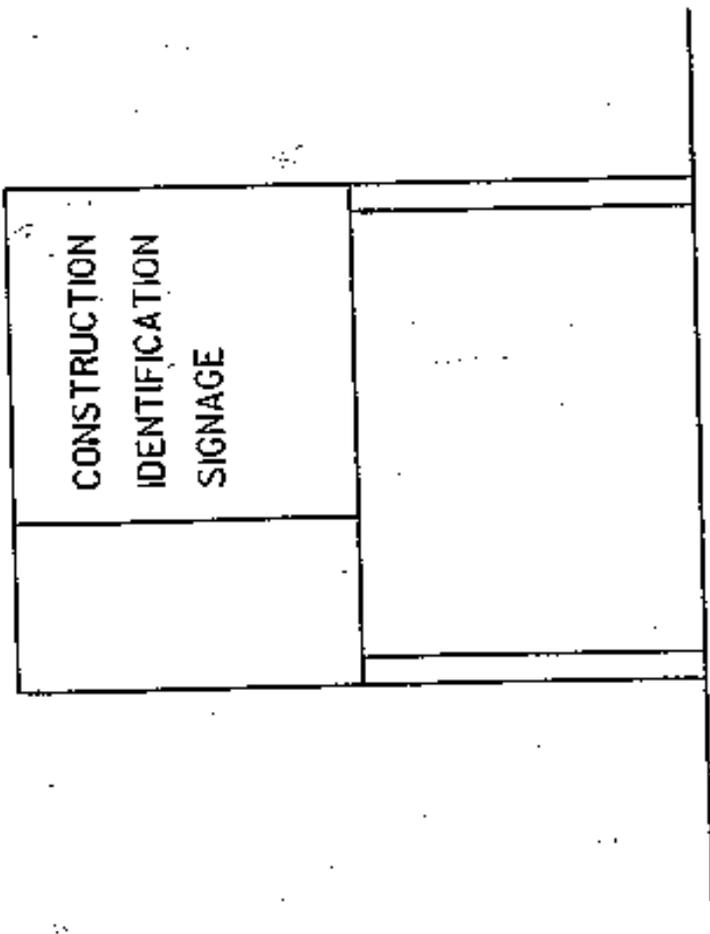
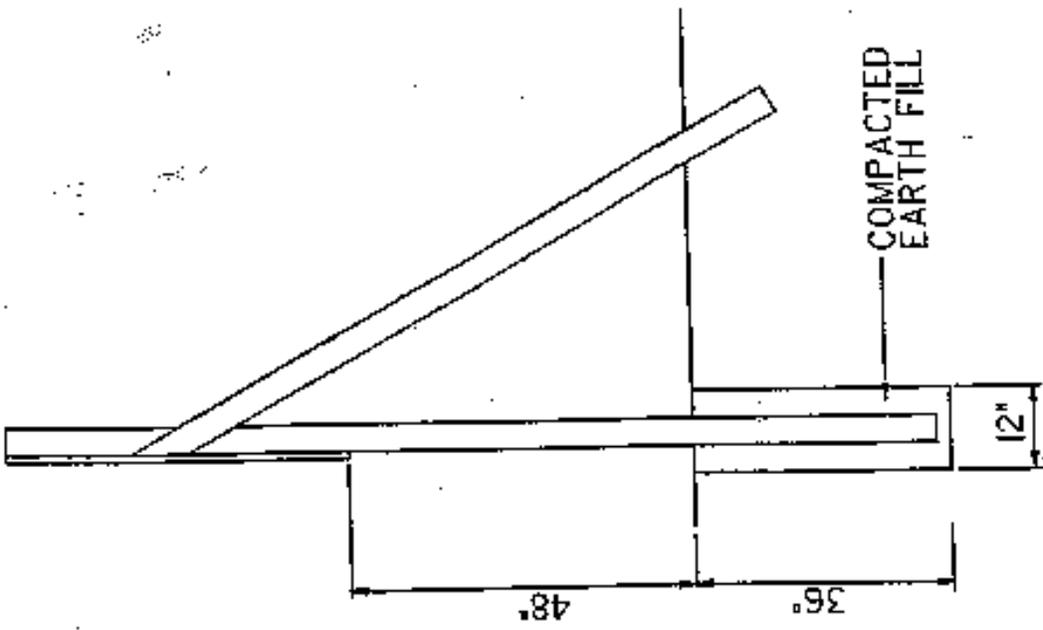
Standard Form LLL-A - Disclosure of Lobbying Activities

Contractor Hazardous Material Inventory Log (EPRCA)

Contractor-Furnished Spoil, Disposal Areas



PROJECT SIGN FOR SAVANNAH MANAGED DESIGNS



Each contractor's safety record is to be posted on Corps managed or supervised construction projects and mounted with the Construction Project Identification sign specified on page 16-2.

The graphic format, color, size and typeface used on the sign are to be reproduced exactly as specified below. The

title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-

mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: Standard two-line title "Safety is a Job Requirement" with 8" (outside diameter) Safety Green first aid logo.
Color: To match Pantone system 347
Typeface: 3" Helvetica Bold
Color: Black

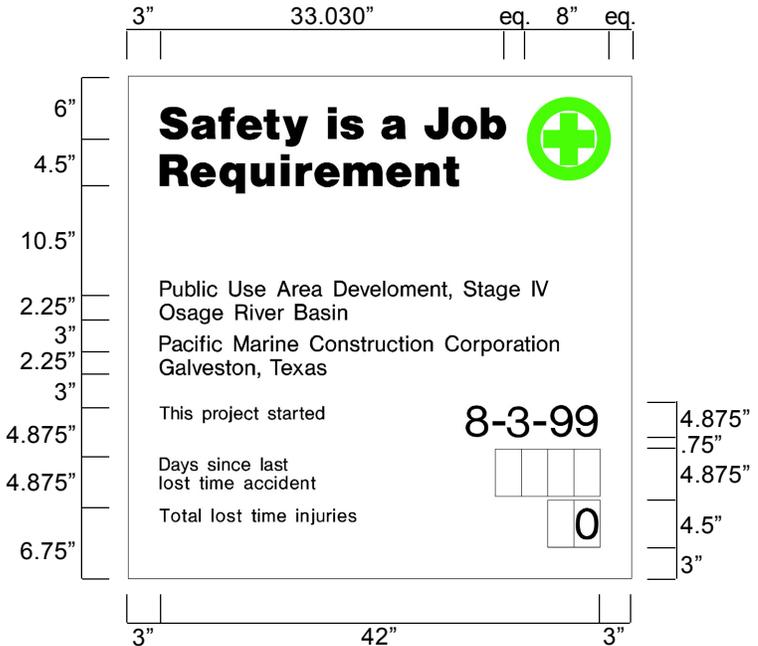
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

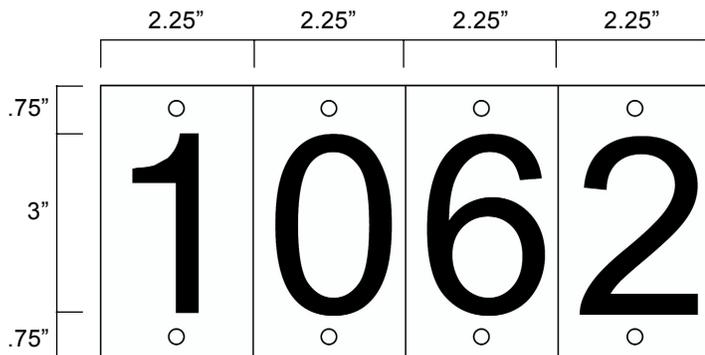
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

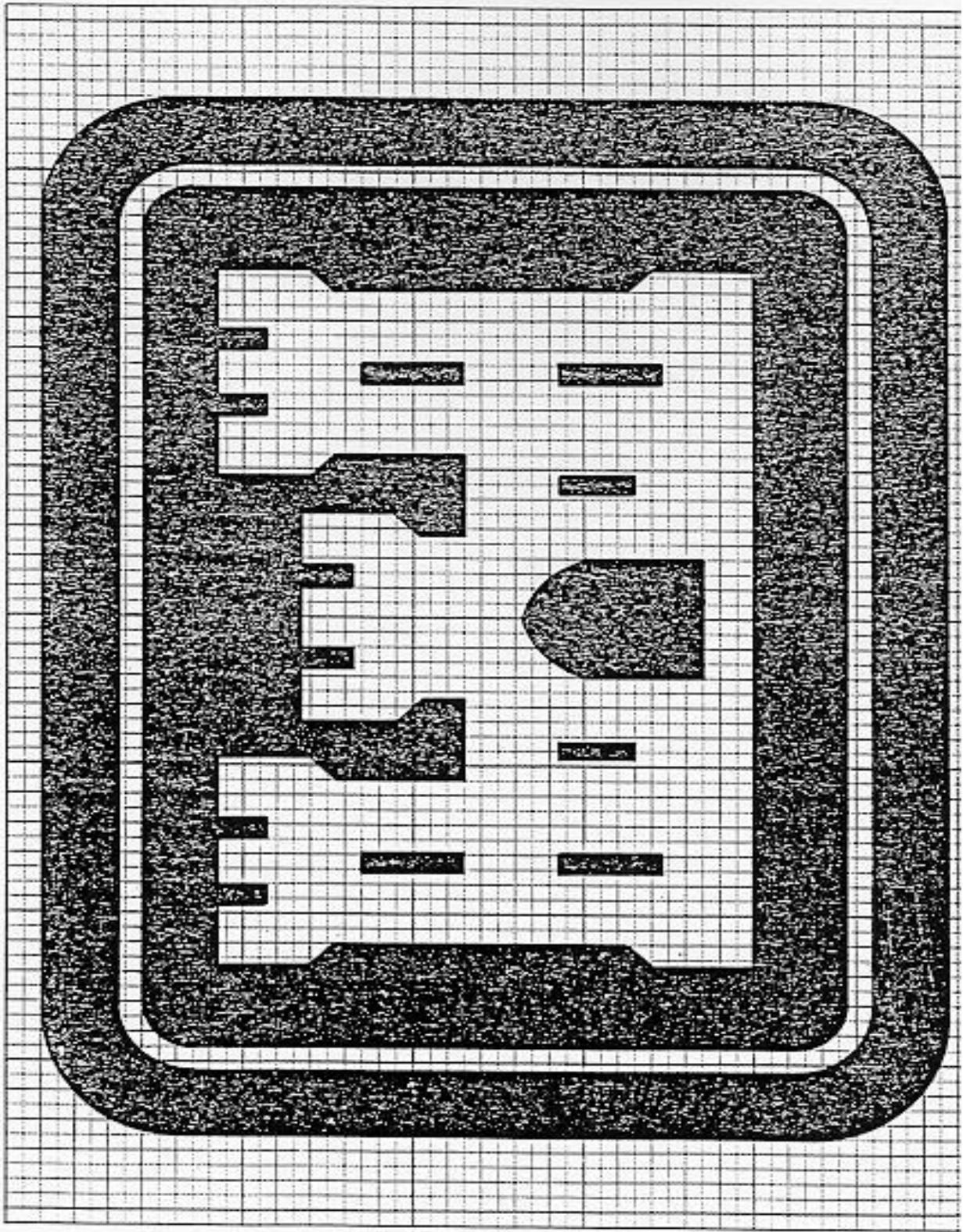
Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x 4.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4'x4'	4"x4"	HDO-3	48"	WH/BK-SG





CORPS OF ENGINEERS LOGO
HALF SIZE

Form A-02
U.S. Army Corps of Engineers
Accident Prevention Plan Checklist

Date of Inspection

Location (Plant or Facility)	Contract Number
Contractor Name	Project Name
Inspector Name (Print)	Inspector Signature

This checklist serves as a guide only, it does not replace or eliminate the need to comply with the requirements set forth in Engineering Manual 385-1-1, Safety and Health Requirements Manual, dated 30 Nov 2014. The references included in this checklist correspond to the applicable sections of EM 385-1-1.

Item Description	Yes	No	N/A	Remarks (Any NO or N/A item)
a. Signature sheet				
1. Includes the name, title, signature, telephone number, and qualifications of the Plan Preparer (<i>Qualified person, i.e. corporate safety staff person, QC</i>)				
2. Includes the name, title, signature, telephone number, and qualifications of the Plan Approver (<i>e.g. owner, company president, regional vice president</i>) (HTRW activities require approval of a Certified Industrial Hygienist, a Certified Safety Professional may approve the plan for operations involving UST removal where contaminants are known to be petroleum, oils, or lubricants).				
3. Includes the name(s), title(s), signature(s), telephone number(s), and qualifications for Plan Concurrence (provide concurrence of other applicable corporate and project personnel (contractor)) (<i>e.g. Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional, project QC.</i>)				
b. Background information				
1. Includes the Contractor Name.				
2. Includes the Contract Number.				
3. Includes the Project Name.				
4a. Includes the Brief Project Description.				
4b. Includes a Discription of the Work to be Performed.				
4c. Includes the Location of the Project (map).				
4d. Includes the Equipment to be Used.				
4e. Includes the Anticipated High Risk Activities.				
5. Includes the Major Phases of Work Anticipated. (<i>Within these major phases of work identified, activities [includes Definable features of Work (DFOWs) and tasks] to be performed that will require an AHA shall be specifically highlighted. This information can then be used by QC, QA and Safety personnel to track AHA submittals. The AHAs for these activities, tasks of DFOWs are NOT submitted at this time (AHAs created/submitted at this time would not be activity-specific as they are intended to be). > See Sections 01.A.14 and 01.A.15.</i>)				

Form A-02 U.S. Army Corps of Engineers Accident Prevention Plan Checklist (cont'd)	Date of Inspection
---	--------------------

Item Description	Yes	No	N/A	Remarks (Any NO or N/A item)
c. Statement of Safety and Health Policy.				
1. Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. <i>(In addition to the corporate policy statement, a copy of the corporate safety program may provide a portion of the information required by the accident prevention plan.)</i>				
2. Includes Contractor's written safety program goals.				
3. Includes Contractor's written safety program objectives.				
4. Includes the Contractor Accident Experience <i>(Copy of OSHA 300 Forms, or equivalent documentation)</i> .				
d. Responsibilities and Lines of Authority.				
1. Includes statement of the employer's ultimate responsibility for the implementation of his SOH program for his own employees, all sub-contractors and all others on the worksite (includes the strict enforcement of the program).				
2. Includes the identification and accountability of personnel responsible for safety and health at both the corporate and project level – including their resumes. Qualifications shall be in accordance with Section 01.A.17. <i>(Only official OSHA 30-Hour cards will be accepted or, if equivalent training is provided, appropriate instructor qualifications.)</i>				
3. Includes equivalent training to the OSHA 30-Hour classes is being presented as qualification, the training shall cover, as a minimum, the areas discussed in Appendix A, Section 3.d.3.(a-d).				
4. Includes the names of Competent (CP) and/or Qualified Person(s) (QP) and proof of competency/qualification to meet specific OSHA CP/QP requirements. <i>(Must include copies of proof of CP/QP)</i> .				
5. Includes requirements and details of the employer's Risk Management Process. <i>(USACE uses the Activity Hazard Analysis (AHA) as part of a total risk management process. Contractors and other individual employer's may use the AHAs or their own version [Job Safety Analyses (JSAs), Job Hazard Analyses (JHAs), or similar Risk Management assessment tools]. These documents are considered equivalent to, and acceptable substitutes for, the USACE's AHA provided the data collected is the same as that required by the AHA.)</i>				
6. Includes requirements for initial activity-specific AHAs to be submitted and accepted at preparatory meetings, prior to work being performed;				
7. Includes requirements that no work by the Contractor shall be performed unless a designated Competent Person/SSHO is present on the job site.				
8. Includes policies and procedures regarding non-compliance with safety requirements (to include disciplinary actions for violation of safety requirements).				
9. Lines of authority.				
10. Includes written company procedures for holding managers and supervisors accountable for safety.				

Form A-02 U.S. Army Corps of Engineers Accident Prevention Plan Checklist (cont'd)				Date of Inspection
Item Description	Yes	No	N/A	Remarks (Any NO or N/A item)
e. Subcontractors and Suppliers.				
1. Includes the list of subcontractors and suppliers. <i>(If not known at the time of initial APP submittal, the contractor shall include the following statement in their initial APP: "The subcontractors for the following DFOWs/activities are not known at this time, but additional information will be submitted to the APP for acceptance prior to the start of any activities listed")</i>				
2. Includes safety responsibilities of subcontractors and suppliers.				
f. Training				
1. Includes requirements for new hire SOH orientation training at the time of initial hire of each new employee.				
2. Includes requirements for mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, confined space entry, crane operator, diver, vehicle operator, HAZWOPER training and certification, PPE) and any requirements for periodic retraining / recertification.				
3. Includes procedures for periodic safety and health training for supervisors and employees.				
4. Includes the requirements for emergency response training.				
g. Safety and Health Inspections				
1. Includes specific assignment of responsibilities for a minimum daily jobsite SOH inspection during periods of work activity.				
1a. Includes the name(s) of individual(s) responsible for conducting safety inspections. (e.g., PM, safety professional, QC, supervisors, employees)				
1b. Includes proof of inspector's training / qualifications.				
1c. Indicates when inspections will be conducted.				
1d. Indicates procedures for documentation. <i>(Furnished sample forms upon which inspections will be recorded.)</i>				
1e. Indicates deficiency tracking system and follow-up procedures.				
2. Includes any external inspections / certifications which may be required. (e.g., US Coast Guard)				
h. Mishap Reporting and Investigation				
1. The plan identifies how, when, and who shall complete the Exposure data (man-hours worked).				
2a. The plan identifies how, when, and who shall complete mishap investigations, reports, and logs. <i>(The contractor shall report, thoroughly investigate, and analyze all mishaps occurring incidentally to an operation, project or facility for which this manual is applicable.)</i>				
2b. The plan identifies how, when, and who shall make immediate notification of major mishaps. <i>(Mishaps shall be reported as soon as possible but not more than 24 hours afterwards to the KO/COR.)</i>				
2c. Includes how, when, and who will provide notice to the KO/COR when corrective actions are completed. <i>(Implement corrective actions as soon as reasonably possible.)</i>				

Form A-02

Date of Inspection

U.S. Army Corps of Engineers Accident Prevention Plan Checklist (cont'd)

Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable safety and occupational health risks and associated compliance plans. Using the EM 385-1-1 as a guide, plans, programs, procedures (assessments and evaluations), may include but not be limited to:

- (1) Include a project-specific compliance plan, as applicable to the work being performed, and as identified below. The plans shall incorporate project-wide procedures to control hazards to which the employees of all project employers may be exposed.
- (2) These procedures shall be coordinated with all project employers and shall include project-specific, project-wide emergency response and evacuation procedures, PPE requirements, recordkeeping and reporting requirements, and training requirements.
- (3) The plans shall be prepared prior to the start of any work activities on the job site (as much as the information can be known at that point in time). The plans shall be updated throughout the life of the project to include changes in personnel, equipment, conditions, etc. Additional revisions shall be incorporated as necessary to reflect changing site conditions, construction methods, personnel roles and responsibilities and construction schedules.
- (4) No activity (DFOW) shall be started on site until the APP is revised and submitted to the GDA for acceptance, with the site-specific plans, programs and procedures required to complete the project.

Item Description	Yes	No	N/A	Remarks (Any NO or N/A item)
i. Plans (Programs, Procedures, Assessments, and Evaluations) required by the Safety Manual				
1. <u>Fatigue Management Plan (01.A.20)</u>				
2. Emergency Plans (01.E):				
(a) Procedures & Test (01.E.01)				
(b) Spill Plans (01.E.01, 06.A.02)				
(c) Fire Fighting Plan (01.E.01; 19.A)				
(d) Posting of Emergency Telephone Numbers (01.E.05)				
(e) Man overboard/abandon ship (19.A.04)				
(f) Plan for prevention of alcohol and drug abuse (01.C.02 & Specs)				
3. <u>Site Sanitation/Housekeeping Plan (02.B)</u>				
4. <u>Medical Support Agreement</u> . Outline on-site medical support and off-site medical arrangements including rescue and medical duties for those employees who are to perform them, and the name(s) of on-site Contractor personnel trained in first aid and CPR. A minimum of two employees shall be certified in CPR and first-aid per shift/site (03.A.01, 03.A.03)				
5. <u>Blood-borne Pathogen Program (03.A.05)</u>				
6. <u>Exposure Control Plan (03.A.05)</u>				
7. <u>Automatic External Defibrillator (AED) Program (03.B.04)</u>				
8. <u>Site Layout Plan (04.A)</u>				
9. <u>Access/Haul Road Plan (04.B)</u>				
10. <u>Hearing Conservation Program (05.C)</u>				
11. <u>Respiratory Protection Plan (05.G)</u>				
12. <u>Health Hazard Control Program (06.A)</u>				
13. <u>Hazard Communication Program (06.B.01)</u>				
14. <u>Process Safety Management Plan (06.B.04)</u>				
15. <u>Lead Compliance Plan (06.C.02 & Specifications)</u>				
16. <u>Asbestos Abatement Plan (06.C.03 & Specifications)</u>				

Form A-02

Date of Inspection

U.S. Army Corps of Engineers Accident Prevention Plan Checklist (cont'd)

Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks and compliance plans. Using the EM 385-1-1 as a guide, plans, programs, procedures (assessments and evaluations), may include but not be limited to:

Item Description	Yes	No	N/A	Remarks (Any NO or N/A item)
i. Plans (Programs, Procedures) continued.				
17. Radiation Safety Program (06.F)				
18. Abrasive Blasting Plan (06.I)				
19. Heat Stress Monitoring Plan (HSMP) (06.J.02)				
20. Cold Stress Monitoring Plan (CSMP) (06.J.04)				
21. Indoor Air Quality Management Plan (06.L)				
22. Mold Remediation Plan (06.L.04)				
23. Chromium (VI) Exposure Evaluation (06.M)				
24. Crystalline Silica Assessment (06.N.02)				
25. Lighting Plan for Night Operations (07.A.06)				
26. Traffic Control Plan (08.C.05)				
27. Fire Prevention Plan (09.A.01)				
28. Wild Land Fire Management Plan (09.L)				
29. Arc Flash Hazard Analysis (11.B)				
30. Assured Equipment Grounding Control Program (AEGCP), (11.D.05, Appendix E)				
31. Hazardous Energy Control Program and Procedures (12.A.01)				
32. Standard Pre-Lift Plan – LHE (16.A.03)				
33. Critical Lift Plan – LHE (16.H)				
34. Naval Architectural Analysis – LHE (Floating) (16.L)				
35. Floating Plant Inspection and Certification (19.A.01)				
36. Severe Weather Plan for Marine Activities (19.A.03)				
37. Emergency Plan for Marine Activities (19.A.04)				
38. Man Overboard/Abandon Ship Procedures (19.A.04)				
39. Float Plan for Launches, Motorboats, Skiffs (19.F.04)				
40. Fall Protection and Prevention Plan (21.D)				
41. Demolition/Renovation Plan (to include engineering survey) (23.A)				
42. Rope Access Work Plan (24.H)				
43. Excavation/Trenching Plan (25.A.01)				
44. Fire Prevention and Protection Plan for Underground Construction (26.D.01)				
45. Compressed Air Work Plan for Underground Construction (26.I.01)				
46. Erection and Removal Plan for Formwork and Shoring (27.C)				
47. Precast Concrete Plan (27.D)				

Form A-02 U.S. Army Corps of Engineers Accident Prevention Plan Checklist (cont'd)	Date of Inspection
---	--------------------

Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks and compliance plans. Using the EM 385-1-1 as a guide, plans, programs, procedures (assessments and evaluations), may include but not be limited to:

Item Description	Yes	No	N/A	Remarks (Any NO or N/A item)
i. Plans (Programs, Procedures) continued.				
48. Lift-slab Plans (27.E)				
49. Masonry Bracing Plan (27.F.01)				
50. Steel Erection Plan (28.B)				
51. Explosives Safety Site Plan (ESSP) (29.A)				
52. Blasting Plan (29.A; 26.J)				
53. Dive Operations Plan (30.A.14, 30.A.16)				
54. Safe Practices Manual for Diving Activities (30.A.15)				
55. Emergency Management Plan for Diving (30.A.18)				
56. Tree Felling/Maintenance Program (31.A.01)				
57. Aircraft/Airfield Construction Safety & Phasing Plan (CSPP) (32.A.02)				
58. Aircraft/Airfield Safety Plan Compliance Document (SPCD) (32.A.02)				
59. Site Safety and Health Plan (HTRW) (33.B)				
60. Confined Space Entry Procedures (34.A.05)				
61. Confined Space Program (34.A.06)				
j. Risk Management Processes (AHAs). Detailed project-specific hazards and controls shall be provided by Activity Hazard Analysis for each activity (DFOW). No work will begin on an activity (DFOW) until the initial AHA has been accepted by the GDA addressing the project-specific hazards. (01.A.14 & 01.A.15) <i>Note: USACE uses the Activity Hazard Analysis (AHA) as part of a total risk management process. Contractors and other individual employer's may use the AHAs or their own version [Job Safety Analyses (JSAs), Job Hazard Analyses (JHAs), or similar Risk Management assessment tools]. These documents are considered equivalent to, and acceptable substitutes for, the USACE's AHA provided the data collected is the same as that required by the AHA.</i>				

Remarks:

<p style="text-align: center;">Form A-02 U.S. Army Corps of Engineers Accident Prevention Plan Checklist (cont'd)</p>	<p style="text-align: center;">Date of Inspection</p>
--	---

Other Remarks:

CONTRACTOR'S NAME
(Address)

DAILY CONTRACTOR QUALITY CONTROL REPORT

Date: _____ Report No. _____

Contract No. _____

Description and Location of Work: _____

Weather: (Clear) (P. Cloudy) (Cloudy); Temperature: ____ Min. ____ Max; ____

Rainfall _____ inches

Contractor/Subcontractors and Area of Responsibility

1. Work Performed Today: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in table above.)

2. Results of Surveillance: (Include satisfactory work completed, or deficiencies with action to be taken.)

3. Tests required by Plans and/or Specifications Performed and Results of tests:

4. Verbal Instructions Received: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

5. Remarks: (Cover delays and any conflicts in plans, specifications, or instructions.)

6. Safety Inspection: (Report violations noted; corrective instructions given; and corrective actions taken.)

7. Equipment Data: (Indicate items of construction equipment, other than hand tools, at jobsite, and whether or not used.)

CONTRACTOR'S VERIFICATION: The above report is complete and correct and all material and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications except as noted above.

Contractor's Approved Authorized Representative

WEEKLY TEMPORARY ELECTRICAL INSPECTION

Week ending _____

Contract No. _____

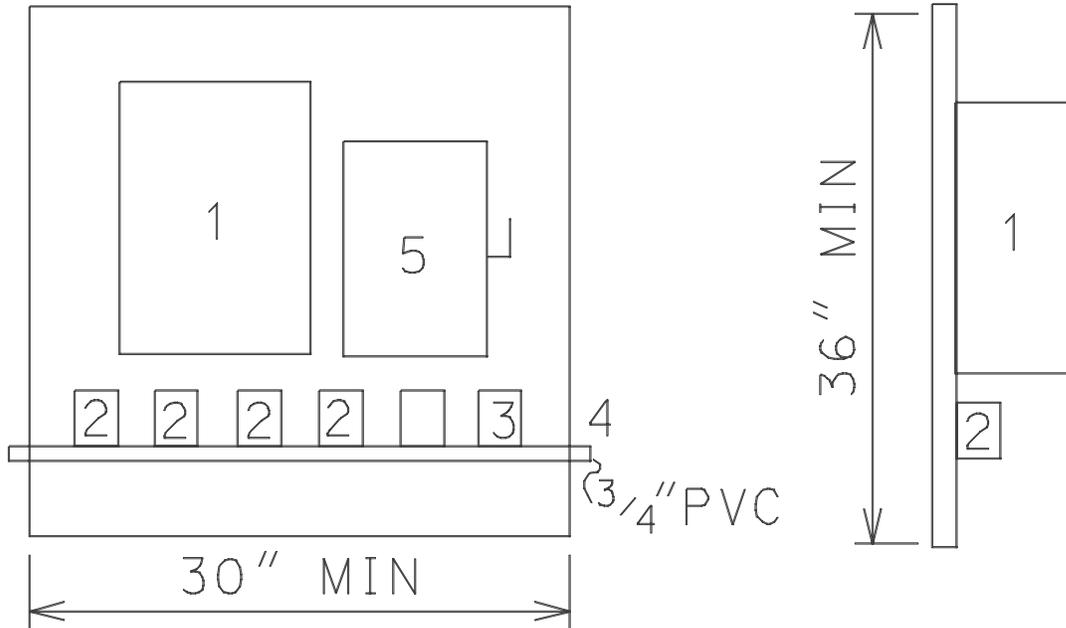
Contract Description _____

The following items were inspected in accordance with requirements in National Electrical Code and Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1.

1. Wire (size, type, condition).
2. Systems and devices (polarity, continuity of ground, resistance to ground).
3. Resistance of ground rods (25 OHMS) measured and recorded.
4. Check GFI for 15/20 amp 120 volt circuits.
5. Plugs and receptacles (type, NEMA rating).
6. Circuit breakers and disconnect (size, type, weatherproof).
7. Extension cords (type, UL listed, insulation condition, splices, location).
8. Open wiring on insulators, nonmetallic sheathed cable, outside clearance (600 volts or less), Festoon lighting (as applicable).

Signature Electrician/Electrical Engineer

MINIMUM STANDARD FOR TEMPORARY ELECTRICAL SERVICE



(DIMENSIONS ARE APPROXIMATE)

A. The backboard for temporary service shall consist of not less than 1/2 inch plywood of exterior grade.

B. Numbers above correspond to the item below:

Item 1 - NEMA 3R circuit breaker type panelboard. This panelboard shall consist of 1 two-pole 60 amp main circuit breaker, 4* one pole 20 AMP branch circuit breakers, and 1* two pole 20 AMP branch circuit breaker. Breakers shall meet Federal Specifications Standards for Class 1A breakers and shall be plug-in type. (*Number of breakers to be adjusted to suit the job requirements.)

Item 2 - Duplex grounding type convenience outlets in standard utility type outlet boxes with covers, meeting the NEC and NEMA requirements for wet locations. Connections to the branch circuit breakers shall be grounded by two conductors #12 NMC cable.

Item 3 - (Optional) A single three-conductor grounding type outlet rated for 250 volt service meeting the NEC and NEMA requirements for wet locations. Connections from this outlet to the two pole breaker shall be by two conductor grounded type NMC cable.

Item 4 - 3/4 inch PVC. This shall be used to support extension cords.

Item 5 - NEMA 3R service disconnect safety switch - 60 amp minimum.

C. The panelboard shall be grounded by #6 copper wire connected to a 3/4 inch by 10-foot long ground rod.

D. Service to the panel shall consist of three copper conductor #6 minimum service entrance cable. This cable may enter the top or side of the panelboard.

E. Periodic inspections of systems and devices will be made by the Contractor at intervals not to exceed 1 week, and a report will be submitted indicating the results.

F. All receptacle outlets that provide temporary electrical power during construction, remodeling, maintenance, repair, or demolition shall have ground-fault circuit-interrupter (GFCI) protection for personnel. GFCI protection shall be provided on all circuits serving portable electric hand tools or semi-portable electric power tools (such as block/brick saws, table saws, air compressors, welding machines, and drill presses). See EM 385-1-1 for exceptions.

G. Per EM 385-1-1 all temporary power distribution systems shall be submitted to the field office before installation.

FOUNDATION DATA

Project Title: _____

FY: _____ L.I. _____

Location: _____

A-E Firm: _____

A-E Phone No. _____

1. The following information is furnished relative to the foundation analysis for the subject project. (A separate CESAS FL 363 shall be completed for each structure involved in the project.)

a. Type of structural system: (Brief Statement)

b. General Scope: _____ feet by _____ feet # of stories _____
(Check applicable blocks below)

- | | |
|--|---|
| <input type="checkbox"/> Slab-on Grade | Basement Walls: |
| <input type="checkbox"/> Crawl Space | <input type="checkbox"/> (1) Fixed at 1st Floor |
| <input type="checkbox"/> Retaining Walls | <input type="checkbox"/> (2) Fixed at Footings |
| <input type="checkbox"/> Areas Recessed below F.F. (Provide with info for Item 2. below) | |

c. Type of Foundation: (Check applicable blocks and fill in loads)

- | | |
|---|--|
| <input type="checkbox"/> Mat. Foundation | <input type="checkbox"/> Approx. Max. Load on Mat. Foundation _____ K/SF |
| <input type="checkbox"/> Spread Footings | <input type="checkbox"/> Approx. Max. Col. Load _____ Kips |
| <input type="checkbox"/> Wall Footings | <input type="checkbox"/> Approx. Max. Wall Load _____ K/ft. |
| <input type="checkbox"/> Foundation Walls | <input type="checkbox"/> Grade Beams |
| <input type="checkbox"/> Rolled Edge Slab | <input type="checkbox"/> Combined Footings (See Item 2. below) |
| <input type="checkbox"/> Piles | <input type="checkbox"/> Underpinning (See Item 2. below) |

d. Other:

Pre-Engineered Building: Yes _____ No _____

Basement and/or Crawl Space Elevation: _____ MSL

Finished Floor Elevation: _____ MSL

FOUNDATION DATA

2. Specific information and details pertinent to the foundation analysis are attached to this form.
3. Attached is one reproducible copy (Sepia or Cronaflex) of the detail site plan and a plan showing the location of columns and walls. (If the maximum column load exceeds 100 Kips or the maximum wall load exceeds 3 K/ft., the individual load, dead and live, for each footing shall be provided on the location plan of columns and walls.)
4. Boring locations will be determined by Savannah District personnel.

AE Representative

Date

ACTIVITY HAZARD ANALYSIS

1. Phase of Construction		
2. Location	3. Contract No.	4. Project
5. Prime Contractor	6. Date of Preparatory	7. Estimated Start Date
Potential Safety Hazard	Procedure to Control Hazard	
8. Contractor's Representative (signature)	9.	

REPORTING OF SAFETY MEETING _____
 (INSTALLATION, FIELD OFFICE, JOB, ETC.)

THRU EN CD OP RE	FROM:
TO SO	

DATE: _____ TIME: _____ (A.M./P.M.)

NO. EMPLOYEES PRESENT _____ DURATION: _____

Old Business: (Review report of last meeting. Follow up on action taken or anticipated to correct any safety deficiencies brought up at last meeting. Discuss any unfinished business.)

New Business: (Discuss any unsafe acts or conditions observed since last safety meeting and any mishaps or injuries which occurred during the week.)

Safety Presentation: (Safety talk, movie, or slide presentation on subject that is relevant to operation at hand.)

DATE AND TIME OF NEXT MEETING _____

_____ (Signature and Title)

TRANSFER AND ACCEPTANCE OF DoD REAL PROPERTY

*Form Approved
OMB No. 0704-0188*

PAGE OF PAGES

The public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Information Management Division, 4800 Mark Center Drive, Alexandria, VA 22350-3100 (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE ABOVE ORGANIZATION.

1. FROM (Organization Name)	2. DATE PREPARED (YYYYMMDD)	3. PROJECT/JOB NUMBER	4. SERIAL NUMBER	8. TRANSACTION DETAILS
5. TO (Organization - Installation Code and Name)	6. RPSUID/SITENAME/ INSTCODE/INSTNAME	7. CONTRACT NUMBER(S)	7a. PLACED-IN-SERVICE DATE (YYYYMMDD)	a. METHOD (X all that apply)
				b. WHEN/EVENT (X one)
				c. TYPE (X one)
				<input type="checkbox"/> ACQUISITION BY CONSTRUCTION <input type="checkbox"/> TRANSFER BETWEEN SERVICES <input type="checkbox"/> CAPITAL IMPROVEMENT <input type="checkbox"/> INVENTORY ADJUSTMENT
				<input type="checkbox"/> TOTAL ASSET PLACED-IN-SERVICE <input type="checkbox"/> PARTIAL ASSET PLACED-IN-SERVICE
				<input type="checkbox"/> DRAFT <input type="checkbox"/> FINAL <input type="checkbox"/> INTERIM

9. ITEM NO.	10a. FACILITY NO.	10b. RPUID	11. CATEGORY CODE	12. CATCODE DESCRIPTION	13. TYPE CODE	14. SUST. CODE	AREA		OTHER		19. COST	20. FUND SOURCE	21. FUND ORG	22. INTEREST CODE	23. ITEM REMARKS
							15. PRIMARY UM	16. PRIMARY UM QUANTITY	17. SECONDARY UM	18. SECONDARY UM QUANTITY					

24. STATEMENT OF COMPLETION. The facilities listed hereon are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.	25a. ACCEPTED BY (Typed Name and Signature)	b. DATE SIGNED (YYYYMMDD)
a. TRANSFERRED BY (Typed Name and Signature)	c. TITLE (DPW/RPAO)	
b. DATE SIGNED (YYYYMMDD)		
c. TITLE (Area Engr./Base Engr./DPW/Construction Agent)	26. PROPERTY VOUCHER NUMBER	

27. CONSTRUCTION DEFICIENCIES (Attach blank sheet for continuations)

28. PROJECT REMARKS (Attach blank sheet for continuations)

INSTRUCTIONS

GENERAL. This form has been designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. It supersedes ENG Forms 290 and 290B (formerly used by the Army and Air Force) and NAVDOCKS Form 2317 (formerly used by the Navy).

Existing instructions issued by the military departments relative to the preparation of DD Form 1354 are applicable to this revised form to the extent that the various items and columns on the superseded forms have been retained. The military departments may promulgate additional instructions, as appropriate.

For detailed instructions on how to fill out this form, please refer to Unified Facilities Criteria (UFC) 1-300-08, dated 16 April 2009 or later.

SPECIFIC DATA ITEMS.

1. **From.** Name of the transferring agency.
2. **Date Prepared.** Date of actual preparation. Enter all dates in YYYYMMDD format (Example: March 31, 2010 = 20100331).
3. **Project/Job Number.** Project number on a DD Form 1391 or Individual Job Order Number.
4. **Serial Number.** Sequential serial number assigned by the preparing organization (e.g., 2010-0001).
5. **To.** Name and address of the receiving installation, activity, and Service of the Real Property Accountable Officer (RPAO).
6. **RPSUID/SITENAME/INSTCODE/INSTNAME.** Site Unique Identifier and name or installation code and name where the constructed facility is located.
7. **Contract Number(s).** Contract number(s) for this project.
- 7a. **Placed-In-Service Date.** RPA Placed In Service Date. This is the date the asset is actually placed-in-service.
8. **Transaction Details.**
 - a. Method of Transaction. Mark (X) as many boxes as apply.
 - b. When/Event. When or event causing preparation of DD Form 1354. X only one box.
 - c. Type. Draft, interim, or final DD Form 1354. X only one box.
9. **Item Number.** Use a separate item number for each facility, no item number for additional usages.
- 10a. **Facility Number.** Assigned in accordance with the Installation/Base Master Numbering Plan.
- 10b. **RPUID.** Identified in Real Property Inventory.
11. **Category Code.** The category code describes the facility usage.
12. **Catcode Description.** The category code name which describes the facility usage.
13. **Type.** Type of construction: P for Permanent; S for Semi- permanent; T for Temporary.
14. **Sustainability Code.** Reports whether or not an asset meets the sustainability guidelines set forth in Section 2(g) of Executive Order 13514. Valid values are: 1 (asset meets the guidelines); 2 (asset does not meet the guidelines); 3 (asset not evaluated); 4 (asset not subject to guidelines).
15. **Area: UM 1.** Area unit of measure; use the unit of measure associated with the category code selected in 11.
16. **Total Quantity UM 1.** The total area for the measure identified in Item 15. Use negative numbers for demolition.
17. **Other: UM 2.** Unit of Measure 2 is the capacity or other measurement unit (e.g., LF, MB, EA, etc.).
18. **Total Quantity UM 2.** The total capacity/other for the measure identified in Item 17.
19. **Cost.** Cost for each facility; for capital improvements to existing facilities, show amount of increase only. If there is no increase for the capital improvement, enter N/A.
20. **Fund Source.** Enter the Fund Source Code for this item.
21. **Funding Organization.** Enter the code for the organization responsible for acquiring this facility.
22. **Interest Code.** Enter the code that reflects government interest or ownership in the facility.
23. **Item Remarks.** Remarks pertaining only to the item number identified in Item 9; show cost sharing.
24. **Statement of Completion.** Typed name, signature, title, and date of signature by the responsible transferring individual or agent.
25. **Accepted By.** Typed name, signature, title, and date of signature by the RPAO or accepting official.
26. **Property Voucher Number.** Next sequential number assigned by the RPAO in voucher register.
27. **Construction Deficiencies.** List construction deficiencies in project during contractor turnover inspection.
28. **Project Remarks.** Project level remarks and continuation of blocks.

1354 CHECKLIST for Project Closeout

PROJECT NUMBER: _____

BUILDING NUMBER: _____

DESCRIPTION OF PROJECT: _____

Describe description of work; i.e., New Construction, Addition, Modification, Renovation, etc...

DRAWING NUMBER : _____

TOTAL COST OF BUILDING: _____ (Cost of building only, sometimes does not include the cost of systems or plants. Costs of installed equipment such as water coolers, urinals, etc. is included in the cost of the building)

DEMOLITION COSTS: _____ (if any)

ACTUAL PROJECT COMPLETION DATE: _____

CECMC PROJECT CLOSEOUT DATE: _____

CATEGORY CODES	NOMENCLATURE	TOTAL COST	TOTAL SF
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

NOTE: Main Line Item Category Codes (A or B) may need clarification or approval sometimes by Real Property if there is a question as to the best definition of a facilities actual use. The CECB Programmer should be inputting the Main Category code prior to initiating an AFF 1391.

NUMBER OF FLOORS: _____

OUTSIDE DIMENSIONS: (from outside wall to outside wall) _____

Main building	SF	_____
Wings	SF	_____
Offsets	SF	_____

CONSTRUCTION MATERIAL:

Foundations (such as concrete)	TYPE	_____
Floors (such as wood, concrete)	TYPE	_____
Walls (such as wood siding)	TYPE	_____
Roof (such as built-up, shingle)	TYPE	_____

UTILITIES ENTERING BUILDING from STREET:

Water Line (size of pipe ex: 1½", 2", 3 ½")	SIZE	_____	LF	_____
Gas Line (size of pipe)	SIZE	_____	LF	_____
Sewer Line (size of pipe)	SIZE	_____	LF	_____
Electrical Service (phase, # wires, voltage, amperage capacity)	SIZE	_____	LF	_____

PLANT SYTEMS - AIR CONDITIONING

Category Code	Nomenclature	Unit of Measure	Amount	Cost	Description
890-126	A/C Window Units	TN	_____	_____	_____
		SF	_____	_____	_____
890-125	A/C System less than 5 Ton	TN	_____	_____	_____
		SF	_____	_____	_____
890-121	A/C System 5 to 25 ton	TN	_____	_____	_____
826-122	A/C System (Plant) 25 to 100 ton	TN	_____	_____	_____
826-123	A/C System (Plant) Over 100 ton	TN	_____	_____	_____
826-234	A/C System from Central Plant	TN	_____	_____	_____

NOTE: Choose, which ever best applies. Include actual tonnage for each unit separately.

PLANT SYTEMS - HEATING

Category Code	Nomenclature	Unit of Measure	Amount	Cost	Description
821-113	Heating from a Central Plant	MB	_____	_____	_____
821-115	Heating Plant 750-500 M Btu	MB	_____	_____	_____
821-116	Heating Plant Over 3500 M Btu	MB	_____	_____	_____

NOTE: Heating Plants under 750 MB don't need to be broken out as a plant on the DD Form 1354, but do need to be annotated on the Real Property Installed Equipment (RPIE) list. Related equipment such as boilers, hot water pumps, fans, etc., should be reflected in the cost for the plant on the DD Form 1354. See the last page for definition of RPIE and a short listing of RPIE items (not all-inclusive).

ELECTRICAL SYSTEMS:

135-583	Telephone Duct Facility	LF	_____	_____	_____
135-586	Telephone Pole	LF	_____	_____	_____
811-147	Emergency Electric Power Generation Plant	kW	_____	_____	_____
		GA	_____	_____	_____
812-223	Primary Overhead Electrical Distribution Line Transformers Power Poles	Type	_____	_____	_____
		FUEL	_____	_____	_____
		LF	_____	_____	_____
812-224	Secondary Overhead Electrical Distribution Line	KVA	_____	_____	_____
		LF	_____	_____	_____
812-225	Primary Underground Electrical Distribution Line	LF	_____	_____	_____
812-226	Secondary Underground Electrical Distribution Line	LF	_____	_____	_____

812-926	Exterior Area Lighting (Street, Parking Area, Safety and Security Lighting) list type, mercury vapor, metal halide, high pressure, low pressure	EA	_____	_____	_____
812-928	Traffic Lights	EA	_____	_____	_____
890-181	Utility Line Duct	LF	_____	_____	_____
890-187	Utility Vault - Four or More Transformers	SF	_____	_____	_____

FIRE PROTECTION:

Category Code	Nomenclature	Unit of Measure	Amount	Cost	Description
843-314	Fire Protection Water Main	LF	_____	_____	_____
843-315	Fire Hydrants	EA	_____	_____	_____
880-211	Closed Head Automatic Sprinklers	SF HD	_____	_____	_____
880-212	Open Head Deluge System (normally found only in aircraft hangers)	SF HD	_____	_____	_____
880-221	Automatic Fire Detection System (fire alarm control panels with associated equip - strobes, lights, bells, heat detectors and pull boxes)	SF EA	_____	_____	_____
880-222	Manual Fire Alarm System - pull boxes only	EA	_____	_____	_____
880-231	CO ₂ Fire Suppression System	EA	_____	_____	_____
880-232	Foam Fire Suppression System	EA	_____	_____	_____
880-234	Halon 1301 Fire Suppression System	EA	_____	_____	_____
880-233	Other Fire System	EA	_____	_____	_____

Choose whichever applies.

SECURITY:

Category Code	Nomenclature	Unit of Measure	Amount	Cost	Description
872-841	Security Alarm System	EA	_____	_____	_____
872-247	Fence Security/Vehicle Barriers	LF/LM	_____	_____	_____
872-248	Fence Interior	LF/LM	_____	_____	_____
872-845	Security Alarm System	EA	_____	_____	_____

FACILITY INFRASTRUCTURE:

Category Code	Nomenclature	Unit of Measure	Amount	Cost	Description
824-464	Gas Lines (piping) list size and type (plastic, steel) in description block	LF	_____	_____	_____
831-169	Sewage Septic Tank - tank size	KG	_____	_____	_____
832-266	Sanitary Sewer - list size line and type material	LF	_____	_____	_____

842-245	Water Distribution Mains - list size and type	LF	_____	_____	_____
851-143	Curbs & Gutters	LF	_____	_____	_____
851-145	Driveway - list type, Asphalt, Concrete, Gravel	SY	_____	_____	_____
851-147	Road - list type, Asphalt, Concrete, Gravel	SY LF	_____	_____	_____
852-261	Vehicle Parking, Operations	SY	_____	_____	_____
852-262	Vehicle Parking, Non-Org	SY	_____	_____	_____
852-289	Sidewalk - list thickness and type of material	SY	_____	_____	_____
871-183	Storm Drain	LF	_____	_____	_____
872-245	Fence, Boundary	LF	_____	_____	_____
872-247	Fence, Security	LF	_____	_____	_____
872-248	Fence, Interior	LF	_____	_____	_____
890-269	Cathodic Protection System	EA	_____	_____	_____

NOTE: Generally, this 1354 Checklist for Category Codes to identify a Facility Infrastructure will suffice without have to reference the entire AF Category Codebook. However sometimes you will have to consult the AF Category Codebook or Real Property office for assistance.

ITEMS OFTEN FOUND IN SPECIALIZED FACILITIES

(Special Purpose)

INDUSTRIAL SHOP AREAS:

Category Code	Item	UM	Amount	Cost	Description
RPIE	Air Compressors	HP	_____	_____	_____
RPIE	Hoists, Cranes-Fixed	TN	_____	_____	_____
RPIE	Hydraulic Lifts	TN	_____	_____	_____
RPIE	Emergency Shower	EA	_____	_____	_____
?	Fixed Spray Paint Booth	SF	_____	_____	_____
890-158	Loading and Unloading Platform	SF	_____	_____	_____
832-255	Industrial Waste Main	LF	_____	_____	_____
890-144	Compressed Air Distribution	LF	_____	_____	_____

NOTE: Identify RPIE. Size, Amount or unit of measure (there is No Category Code for RPIE items).

CHAPEL:

Category Code	Item	UM	Amount	Description
RPIE	Pews	EA	_____	_____
RPIE	Altars	EA	_____	_____
RPIE	Lecterns	EA	_____	_____
RPIE	Pulpit	EA	_____	_____

THEATER:

Category Code	Item	UM	Amount	Description
RPIE	Theater Seats Secured to Floor	EA	_____	_____

RPIE	Stage and Auditorium Curtains	EA	_____	_____
------	-------------------------------	----	-------	-------

BILLETING /TLF/VOQ:

Category Code	Item	UM	Amount	Description
RPIE	Built-in Household Dishwasher	EA	_____	_____
RPIE	Garbage Disposal	EA	_____	_____
RPIE	Range Hood with Exhaust Fan	EA	_____	_____
RPIE	Water Softener (house hold type)	EA	_____	_____

MWR FACILITIES:

Category Code	Item	UM	Amount	Description
RPIE	Dishwashers (built-in)	EA	_____	_____
RPIE	Walk-in Refrigerators (built-in)	EA	_____	_____
RPIE	Garbage Disposal Unit	EA	_____	_____
RPIE	Range Hood with Exhaust Fan	EA	_____	_____
RPIE	PA Systems (built-in)	EA	_____	_____
RPIE	Vault (built-in)	EA	_____	_____
RPIE	Stage and Auditorium Curtains	EA	_____	_____
RPIE	Playground Equipment (permanently affixed)	EA	_____	_____
RPIE	Bowling Alley Lanes, Approaches, Ball Returns	EA	_____	_____
890-158	Loading and Unloading Platform	SF	_____	_____

Post Office:

Category Code	Item	UM	Amount	Description
RPIE	Post Office Lock Boxes	EA	_____	_____

ADDITION or ALTERATION to a FACILITY:

Item	Yes	No
a. Outside dimensions of addition	_____	_____
b. Foundation	_____	_____
c. Floors	_____	_____
d. Walls	_____	_____
e. Roof	_____	_____
f. Utility plants or systems added, replaced, or removed	_____	_____
g. Real property installed equipment removed, added, or replaced	_____	_____
h. Demolition costs	_____	_____
i. Addition or deletion of related facilities	_____	_____

- j. Addition or deletion of porches, sheds, balconies, mezzanines, etc. _____
- k. **Real property installed equipment (RPIE) removed, installed, or replaced with a larger or smaller unit** _____

NOTE: Whenever a project calls for an Addition to an Existing Building or Facility. Use the 1354 checklist above paying close attention to f, g, h, and k.

REAL PROPERTY INSTALLED EQUIPMENT: are those items of government-owned or leased accessory equipment apparatus and fixtures that are essential to the function of the real property and are permanently attached to, integrated into or are on government owned or leased property.

NOTE: RPIE cannot be on an organizational account known as the TA (Table of Allowance) for it to be a RPIE item i.e., an authorized dishwasher (clipper) in the Dining Facility should be on their organizational Table of Allowances and cannot be a RIPIE item. However a dishwasher in the housing area, or billeting is definitely a RPIE item. The difference is the Dining Facility is authorized a dishwasher on their TA therefore it cannot be RIPIE.

Item	UM/Size	Amount	Description
Commode			
Dehumidifiers			
Elevators			
Evaporative Coolers	CFM		
Exhaust Fan			
Forced Air Heating			
Heating Plant Under 750 MB	MB		
Hot Water Heater	GAL		
Lavatory			
Other Heating			
Refrigerated Drinking Fountain			
Theater-type Seats Secured to Floor			
Urinal			
Utility Sink			

Examples of NON-RPIE Items:

Note: Not All-Inclusive

Air Dryers/Compressors supporting communication lines	Portable Buildings, Air Conditioners, Water Chillers
Bicycle Storage Lockers/Metal Lockers (removable)	Projection Screens
Compressed Natural Gas Dispensing Systems	Sawdust Collectors
Emergency Power Systems (EPS)	Stationary Acetylene Generators
HEMP/TEMPEST shielding equipment	Systems Furniture
Ice-Making Machines	Venetian Blinds
Intercom Equipment	Walk-In Coolers (if free standing)
Prewired Workstations	Window Shades
Power Conditioning Continuation Interfacing Equipment (PCCIE) – this includes Uninterruptible Power Supply (UPS)	Compressed Air System and Water Cooling/Recycling System
Public Address System	Satellite Cable Television Antennas

PEST MANAGEMENT REPORT

Form Approved
OMB No. 0704-0188

C.D. CODE UIC

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

The public reporting burden for this collection of information is estimated to average 6 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Service Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION.

1. MAJOR OR REVIEWING COMMAND	
a. NAME	b. ADDRESS
2. REPORTING INSTALLATION	
a. NAME	b. ADDRESS

NO.	TARGET PEST			OPERATION				PESTICIDE				TIME	
	Name (a) 13 - 15	Name (b) 17 - 19	Total Units Treated (c) 20 - 24	Unit (d) 25 - 27	Site (e) 28 - 30	Name (f) 31 - 33	Form (g) 34 - 36	Amount (h) 37 - 41	Unit (i) 42 - 43	Final Conc. % (j) 44 - 49	Rate (Per Area Unit) Lbs. (k) (l) 50 - 55		% (m) 56 - 58
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													

NO.	TARGET PEST			OPERATION				PESTICIDE				TIME Hours (n) 89 - 71		
	Name (a) 13 - 15	Name (b) 17 - 19	Total Units Treated (c) 20 - 24	Unit (d) 25 - 27	Site (e) 28 - 30	Name (f) 31 - 33	Form (g) 34 - 36	Amount (h) 37 - 41	Unit (i) 42 - 43	Final Conc. % (j) 44 - 49	RATE (Per Area Unit) Lbs. (k) 50 - 55 % (l) 56 - 58		SUPPLY SOURCE Enter S.N.G.C. (m) 68	
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

3. REMARKS

INSTRUCTIONS FOR USE

- Detailed instructions of the implementing department directive shall be used in the preparation of this report.
- Military installations shall prepare this report by the 15th day after the end of each month. The report shall be prepared and signed by the DOD certified pest management supervisor, applicator or inspector and by the installation engineer.
- Three copies shall be signed and distributed as follows:
 - Copy No. 1. To the appropriate pest management professional in accordance with implementing department directives for technical review.
 - Copy No. 2. Record to the installation surgeon.
 - Copy No. 3. Record copy to the installations engineer for two year retention in accordance with Public Law 92-516.

4. INSTALLATION ENGINEER (Reviewing Officer)

a. TYPED NAME _____ c. DATE (YYYYMMDD) _____

b. SIGNATURE _____

5. INSTALLATION CERTIFIED PEST MANAGEMENT SUPERVISOR, APPLICATOR, OR INSPECTOR

a. TYPED NAME _____ c. DATE (YYYYMMDD) _____

b. SIGNATURE _____

Date	Units Serviced	Work Origin	Unit of Measure	Target Pest	Control Operation	If Pesticide is Used				Labor Time	Applicator Initials
						Name	EPA Reg	% Conc	Amount		

REMARKS



Instructions for Employment Eligibility Verification

Department of Homeland Security
U.S. Citizenship and Immigration Services

USCIS
Form I-9
OMB No. 1615-0047
Expires 03/31/2016

Read all instructions carefully before completing this form.

Anti-Discrimination Notice. It is illegal to discriminate against any work-authorized individual in hiring, discharge, recruitment or referral for a fee, or in the employment eligibility verification (Form I-9 and E-Verify) process based on that individual's citizenship status, immigration status or national origin. Employers **CANNOT** specify which document(s) they will accept from an employee. The refusal to hire an individual because the documentation presented has a future expiration date may also constitute illegal discrimination. For more information, call the Office of Special Counsel for Immigration-Related Unfair Employment Practices (OSC) at 1-800-255-7688 (employees), 1-800-255-8155 (employers), or 1-800-237-2515 (TDD), or visit www.justice.gov/crt/about/osc.

What Is the Purpose of This Form?

Employers must complete Form I-9 to document verification of the identity and employment authorization of each new employee (both citizen and noncitizen) hired after November 6, 1986, to work in the United States. In the Commonwealth of the Northern Mariana Islands (CNMI), employers must complete Form I-9 to document verification of the identity and employment authorization of each new employee (both citizen and noncitizen) hired after November 27, 2011. Employers should have used Form I-9 CNMI between November 28, 2009 and November 27, 2011.

General Instructions

Employers are responsible for completing and retaining Form I-9. For the purpose of completing this form, the term "employer" means all employers, including those recruiters and referrers for a fee who are agricultural associations, agricultural employers, or farm labor contractors.

Form I-9 is made up of three sections. Employers may be fined if the form is not complete. Employers are responsible for retaining completed forms. Do not mail completed forms to U.S. Citizenship and Immigration Services (USCIS) or Immigration and Customs Enforcement (ICE).

Section 1. Employee Information and Attestation

Newly hired employees must complete and sign Section 1 of Form I-9 **no later than the first day of employment**. Section 1 should never be completed before the employee has accepted a job offer.

Provide the following information to complete Section 1:

Name: Provide your full legal last name, first name, and middle initial. Your last name is your family name or surname. If you have two last names or a hyphenated last name, include both names in the last name field. Your first name is your given name. Your middle initial is the first letter of your second given name, or the first letter of your middle name, if any.

Other names used: Provide all other names used, if any (including maiden name). If you have had no other legal names, write "N/A."

Address: Provide the address where you currently live, including Street Number and Name, Apartment Number (if applicable), City, State, and Zip Code. Do not provide a post office box address (P.O. Box). Only border commuters from Canada or Mexico may use an international address in this field.

Date of Birth: Provide your date of birth in the mm/dd/yyyy format. For example, January 23, 1950, should be written as 01/23/1950.

U.S. Social Security Number: Provide your 9-digit Social Security number. Providing your Social Security number is voluntary. However, if your employer participates in E-Verify, you must provide your Social Security number.

E-mail Address and Telephone Number (Optional): You may provide your e-mail address and telephone number. Department of Homeland Security (DHS) may contact you if DHS learns of a potential mismatch between the information provided and the information in DHS or Social Security Administration (SSA) records. You may write "N/A" if you choose not to provide this information.

All employees must attest in Section 1, under penalty of perjury, to their citizenship or immigration status by checking one of the following four boxes provided on the form:

1. **A citizen of the United States**
2. **A noncitizen national of the United States:** Noncitizen nationals of the United States are persons born in American Samoa, certain former citizens of the former Trust Territory of the Pacific Islands, and certain children of noncitizen nationals born abroad.
3. **A lawful permanent resident:** A lawful permanent resident is any person who is not a U.S. citizen and who resides in the United States under legally recognized and lawfully recorded permanent residence as an immigrant. The term "lawful permanent resident" includes conditional residents. If you check this box, write either your Alien Registration Number (A-Number) or USCIS Number in the field next to your selection. At this time, the USCIS Number is the same as the A-Number without the "A" prefix.
4. **An alien authorized to work:** If you are not a citizen or national of the United States or a lawful permanent resident, but are authorized to work in the United States, check this box.

If you check this box:

- a. Record the date that your employment authorization expires, if any. Aliens whose employment authorization does not expire, such as refugees, asylees, and certain citizens of the Federated States of Micronesia, the Republic of the Marshall Islands, or Palau, may write "N/A" on this line.
- b. Next, enter your Alien Registration Number (A-Number)/USCIS Number. At this time, the USCIS Number is the same as your A-Number without the "A" prefix. If you have not received an A-Number/USCIS Number, record your Admission Number. You can find your Admission Number on Form I-94, "Arrival-Departure Record," or as directed by USCIS or U.S. Customs and Border Protection (CBP).
 - (1) If you obtained your admission number from CBP in connection with your arrival in the United States, then also record information about the foreign passport you used to enter the United States (number and country of issuance).
 - (2) If you obtained your admission number from USCIS *within the United States*, or you entered the United States without a foreign passport, you must write "N/A" in the Foreign Passport Number and Country of Issuance fields.

Sign your name in the "Signature of Employee" block and record the date you completed and signed Section 1. By signing and dating this form, you attest that the citizenship or immigration status you selected is correct and that you are aware that you may be imprisoned and/or fined for making false statements or using false documentation when completing this form. To fully complete this form, you must present to your employer documentation that establishes your identity and employment authorization. Choose which documents to present from the Lists of Acceptable Documents, found on the last page of this form. You must present this documentation no later than the third day after beginning employment, although you may present the required documentation before this date.

Preparer and/or Translator Certification

The Preparer and/or Translator Certification must be completed if the employee requires assistance to complete Section 1 (e.g., the employee needs the instructions or responses translated, someone other than the employee fills out the information blocks, or someone with disabilities needs additional assistance). The employee must still sign Section 1.

Minors and Certain Employees with Disabilities (Special Placement)

Parents or legal guardians assisting minors (individuals under 18) and certain employees with disabilities should review the guidelines in the *Handbook for Employers: Instructions for Completing Form I-9 (M-274)* on www.uscis.gov/I-9Central before completing Section 1. These individuals have special procedures for establishing identity if they cannot present an identity document for Form I-9. The special procedures include (1) the parent or legal guardian filling out Section 1 and writing "minor under age 18" or "special placement," whichever applies, in the employee signature block; and (2) the employer writing "minor under age 18" or "special placement" under List B in Section 2.

Section 2. Employer or Authorized Representative Review and Verification

Before completing Section 2, employers must ensure that Section 1 is completed properly and on time. Employers may not ask an individual to complete Section 1 before he or she has accepted a job offer.

Employers or their authorized representative must complete Section 2 by examining evidence of identity and employment authorization within 3 business days of the employee's first day of employment. For example, if an employee begins employment on Monday, the employer must complete Section 2 by Thursday of that week. However, if an employer hires an individual for less than 3 business days, Section 2 must be completed no later than the first day of employment. An employer may complete Form I-9 before the first day of employment if the employer has offered the individual a job and the individual has accepted.

Employers cannot specify which document(s) employees may present from the Lists of Acceptable Documents, found on the last page of Form I-9, to establish identity and employment authorization. Employees must present one selection from List A **OR** a combination of one selection from List B and one selection from List C. List A contains documents that show both identity and employment authorization. Some List A documents are combination documents. The employee must present combination documents together to be considered a List A document. For example, a foreign passport and a Form I-94 containing an endorsement of the alien's nonimmigrant status must be presented together to be considered a List A document. List B contains documents that show identity only, and List C contains documents that show employment authorization only. If an employee presents a List A document, he or she should **not** present a List B and List C document, and vice versa. If an employer participates in E-Verify, the List B document must include a photograph.

In the field below the Section 2 introduction, employers must enter the last name, first name and middle initial, if any, that the employee entered in Section 1. This will help to identify the pages of the form should they get separated.

Employers or their authorized representative must:

1. Physically examine each original document the employee presents to determine if it reasonably appears to be genuine and to relate to the person presenting it. The person who examines the documents must be the same person who signs Section 2. The examiner of the documents and the employee must both be physically present during the examination of the employee's documents.
2. Record the document title shown on the Lists of Acceptable Documents, issuing authority, document number and expiration date (if any) from the original document(s) the employee presents. You may write "N/A" in any unused fields.

If the employee is a student or exchange visitor who presented a foreign passport with a Form I-94, the employer should also enter in Section 2:

- a. The student's Form I-20 or DS-2019 number (Student and Exchange Visitor Information System-SEVIS Number); **and** the program end date from Form I-20 or DS-2019.
3. Under Certification, enter the employee's first day of employment. Temporary staffing agencies may enter the first day the employee was placed in a job pool. Recruiters and recruiters for a fee do not enter the employee's first day of employment.
 4. Provide the name and title of the person completing Section 2 in the Signature of Employer or Authorized Representative field.
 5. Sign and date the attestation on the date Section 2 is completed.
 6. Record the employer's business name and address.
 7. Return the employee's documentation.

Employers may, but are not required to, photocopy the document(s) presented. If photocopies are made, they should be made for **ALL** new hires or reverifications. Photocopies must be retained and presented with Form I-9 in case of an inspection by DHS or other federal government agency. Employers must always complete Section 2 even if they photocopy an employee's document(s). Making photocopies of an employee's document(s) cannot take the place of completing Form I-9. Employers are still responsible for completing and retaining Form I-9.

Unexpired Documents

Generally, only unexpired, original documentation is acceptable. The only exception is that an employee may present a certified copy of a birth certificate. Additionally, in some instances, a document that appears to be expired may be acceptable if the expiration date shown on the face of the document has been extended, such as for individuals with temporary protected status. Refer to the *Handbook for Employers: Instructions for Completing Form I-9 (M-274)* or I-9 Central (www.uscis.gov/I-9Central) for examples.

Receipts

If an employee is unable to present a required document (or documents), the employee can present an acceptable receipt in lieu of a document from the Lists of Acceptable Documents on the last page of this form. Receipts showing that a person has applied for an initial grant of employment authorization, or for renewal of employment authorization, are not acceptable. Employers cannot accept receipts if employment will last less than 3 days. Receipts are acceptable when completing Form I-9 for a new hire or when reverification is required.

Employees must present receipts within 3 business days of their first day of employment, or in the case of reverification, by the date that reverification is required, and must present valid replacement documents within the time frames described below.

There are three types of acceptable receipts:

1. A receipt showing that the employee has applied to replace a document that was lost, stolen or damaged. The employee must present the actual document within 90 days from the date of hire.
2. The arrival portion of Form I-94/I-94A with a temporary I-551 stamp and a photograph of the individual. The employee must present the actual Permanent Resident Card (Form I-551) by the expiration date of the temporary I-551 stamp, or, if there is no expiration date, within 1 year from the date of issue.
3. The departure portion of Form I-94/I-94A with a refugee admission stamp. The employee must present an unexpired Employment Authorization Document (Form I-766) or a combination of a List B document and an unrestricted Social Security card within 90 days.

When the employee provides an acceptable receipt, the employer should:

1. Record the document title in Section 2 under the sections titled List A, List B, or List C, as applicable.
2. Write the word "receipt" and its document number in the "Document Number" field. Record the last day that the receipt is valid in the "Expiration Date" field.

By the end of the receipt validity period, the employer should:

1. Cross out the word "receipt" and any accompanying document number and expiration date.
2. Record the number and other required document information from the actual document presented.
3. Initial and date the change.

See the *Handbook for Employers: Instructions for Completing Form I-9 (M-274)* at www.uscis.gov/I-9Central for more information on receipts.

Section 3. Reverification and Rehires

Employers or their authorized representatives should complete Section 3 when reverifying that an employee is authorized to work. When rehiring an employee within 3 years of the date Form I-9 was originally completed, employers have the option to complete a new Form I-9 or complete Section 3. When completing Section 3 in either a reverification or rehire situation, if the employee's name has changed, record the name change in Block A.

For employees who provide an employment authorization expiration date in Section 1, employers must reverify employment authorization on or before the date provided.

Some employees may write "N/A" in the space provided for the expiration date in Section 1 if they are aliens whose employment authorization does not expire (e.g., asylees, refugees, certain citizens of the Federated States of Micronesia, the Republic of the Marshall Islands, or Palau). Reverification does not apply for such employees unless they chose to present evidence of employment authorization in Section 2 that contains an expiration date and requires reverification, such as Form I-766, Employment Authorization Document.

Reverification applies if evidence of employment authorization (List A or List C document) presented in Section 2 expires. However, employers should not reverify:

1. U.S. citizens and noncitizen nationals; or
2. Lawful permanent residents who presented a Permanent Resident Card (Form I-551) for Section 2.

Reverification does not apply to List B documents.

If both Section 1 and Section 2 indicate expiration dates triggering the reverification requirement, the employer should reverify by the earlier date.

For reverification, an employee must present unexpired documentation from either List A or List C showing he or she is still authorized to work. Employers CANNOT require the employee to present a particular document from List A or List C. The employee may choose which document to present.

To complete Section 3, employers should follow these instructions:

1. Complete Block A if an employee's name has changed at the time you complete Section 3.
2. Complete Block B with the date of rehire if you rehire an employee within 3 years of the date this form was originally completed, and the employee is still authorized to be employed on the same basis as previously indicated on this form. Also complete the "Signature of Employer or Authorized Representative" block.
3. Complete Block C if:
 - a. The employment authorization or employment authorization document of a current employee is about to expire and requires reverification; or
 - b. You rehire an employee within 3 years of the date this form was originally completed and his or her employment authorization or employment authorization document has expired. (Complete Block B for this employee as well.)

To complete Block C:

- a. Examine either a List A or List C document the employee presents that shows that the employee is currently authorized to work in the United States; and
 - b. Record the document title, document number, and expiration date (if any).
4. After completing block A, B or C, complete the "Signature of Employer or Authorized Representative" block, including the date.

For reverification purposes, employers may either complete Section 3 of a new Form I-9 or Section 3 of the previously completed Form I-9. Any new pages of Form I-9 completed during reverification must be attached to the employee's original Form I-9. If you choose to complete Section 3 of a new Form I-9, you may attach just the page containing Section 3, with the employee's name entered at the top of the page, to the employee's original Form I-9. If there is a more current version of Form I-9 at the time of reverification, you must complete Section 3 of that version of the form.

What Is the Filing Fee?

There is no fee for completing Form I-9. This form is not filed with USCIS or any government agency. Form I-9 must be retained by the employer and made available for inspection by U.S. Government officials as specified in the "USCIS Privacy Act Statement" below.

USCIS Forms and Information

For more detailed information about completing Form I-9, employers and employees should refer to the *Handbook for Employers: Instructions for Completing Form I-9 (M-274)*.

You can also obtain information about Form I-9 from the USCIS Web site at www.uscis.gov/I-9Central, by e-mailing USCIS at I-9Central@dhs.gov, or by calling 1-888-464-4218. For TDD (hearing impaired), call 1-877-875-6028.

To obtain USCIS forms or the *Handbook for Employers*, you can download them from the USCIS Web site at www.uscis.gov/forms. You may order USCIS forms by calling our toll-free number at 1-800-870-3676. You may also obtain forms and information by contacting the USCIS National Customer Service Center at 1-800-375-5283. For TDD (hearing impaired), call 1-800-767-1833.

Information about E-Verify, a free and voluntary program that allows participating employers to electronically verify the employment eligibility of their newly hired employees, can be obtained from the USCIS Web site at www.dhs.gov/E-Verify, by e-mailing USCIS at E-Verify@dhs.gov or by calling 1-888-464-4218. For TDD (hearing impaired), call 1-877-875-6028.

Employees with questions about Form I-9 and/or E-Verify can reach the USCIS employee hotline by calling 1-888-897-7781. For TDD (hearing impaired), call 1-877-875-6028.

Photocopying and Retaining Form I-9

A blank Form I-9 may be reproduced, provided all sides are copied. The instructions and Lists of Acceptable Documents must be available to all employees completing this form. Employers must retain each employee's completed Form I-9 for as long as the individual works for the employer. Employers are required to retain the pages of the form on which the employee and employer enter data. If copies of documentation presented by the employee are made, those copies must also be kept with the form. Once the individual's employment ends, the employer must retain this form for either 3 years after the date of hire or 1 year after the date employment ended, whichever is later.

Form I-9 may be signed and retained electronically, in compliance with Department of Homeland Security regulations at 8 CFR 274a.2.

USCIS Privacy Act Statement

AUTHORITIES: The authority for collecting this information is the Immigration Reform and Control Act of 1986, Public Law 99-603 (8 USC 1324a).

PURPOSE: This information is collected by employers to comply with the requirements of the Immigration Reform and Control Act of 1986. This law requires that employers verify the identity and employment authorization of individuals they hire for employment to preclude the unlawful hiring, or recruiting or referring for a fee, of aliens who are not authorized to work in the United States.

DISCLOSURE: Submission of the information required in this form is voluntary. However, failure of the employer to ensure proper completion of this form for each employee may result in the imposition of civil or criminal penalties. In addition, employing individuals knowing that they are unauthorized to work in the United States may subject the employer to civil and/or criminal penalties.

ROUTINE USES: This information will be used by employers as a record of their basis for determining eligibility of an employee to work in the United States. The employer will keep this form and make it available for inspection by authorized officials of the Department of Homeland Security, Department of Labor, and Office of Special Counsel for Immigration-Related Unfair Employment Practices.

Paperwork Reduction Act

An agency may not conduct or sponsor an information collection and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The public reporting burden for this collection of information is estimated at 35 minutes per response, including the time for reviewing instructions and completing and retaining the form. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: U.S. Citizenship and Immigration Services, Regulatory Coordination Division, Office of Policy and Strategy, 20 Massachusetts Avenue NW, Washington, DC 20529-2140; OMB No. 1615-0047. **Do not mail your completed Form I-9 to this address.**



Employment Eligibility Verification

Department of Homeland Security
U.S. Citizenship and Immigration Services

USCIS
Form I-9
OMB No. 1615-0047
Expires 03/31/2016

▶ **START HERE.** Read instructions carefully before completing this form. The instructions must be available during completion of this form.
ANTI-DISCRIMINATION NOTICE: It is illegal to discriminate against work-authorized individuals. Employers **CANNOT** specify which document(s) they will accept from an employee. The refusal to hire an individual because the documentation presented has a future expiration date may also constitute illegal discrimination.

Section 1. Employee Information and Attestation *(Employees must complete and sign Section 1 of Form I-9 no later than the first day of employment, but not before accepting a job offer.)*

Last Name (Family Name)		First Name (Given Name)		Middle Initial	Other Names Used (if any)		
Address (Street Number and Name)			Apt. Number	City or Town		State	Zip Code
Date of Birth (mm/dd/yyyy)	U.S. Social Security Number		E-mail Address			Telephone Number	

I am aware that federal law provides for imprisonment and/or fines for false statements or use of false documents in connection with the completion of this form.

I attest, under penalty of perjury, that I am (check one of the following):

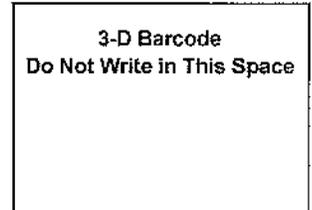
- A citizen of the United States
- A noncitizen national of the United States *(See instructions)*
- A lawful permanent resident (Alien Registration Number/USCIS Number): _____
- An alien authorized to work until (expiration date, if applicable, mm/dd/yyyy) _____. Some aliens may write "N/A" in this field. *(See instructions)*

For aliens authorized to work, provide your Alien Registration Number/USCIS Number OR Form I-94 Admission Number:

1. Alien Registration Number/USCIS Number: _____

OR

2. Form I-94 Admission Number: _____



If you obtained your admission number from CBP in connection with your arrival in the United States, include the following:

Foreign Passport Number: _____

Country of Issuance: _____

Some aliens may write "N/A" on the Foreign Passport Number and Country of Issuance fields. *(See instructions)*

Signature of Employee:	Date (mm/dd/yyyy):
------------------------	--------------------

Preparer and/or Translator Certification *(To be completed and signed if Section 1 is prepared by a person other than the employee.)*

I attest, under penalty of perjury, that I have assisted in the completion of this form and that to the best of my knowledge the information is true and correct.

Signature of Preparer or Translator:		Date (mm/dd/yyyy):		
Last Name (Family Name)		First Name (Given Name)		
Address (Street Number and Name)		City or Town	State	Zip Code



Employer Completes Next Page



Section 2. Employer or Authorized Representative Review and Verification

(Employers or their authorized representative must complete and sign Section 2 within 3 business days of the employee's first day of employment. You must physically examine one document from List A OR examine a combination of one document from List B and one document from List C as listed on the "Lists of Acceptable Documents" on the next page of this form. For each document you review, record the following information: document title, issuing authority, document number, and expiration date, if any.)

Employee Last Name, First Name and Middle Initial from Section 1:

List A Identity and Employment Authorization	OR	List B Identity	AND	List C Employment Authorization
Document Title:		Document Title:		Document Title:
Issuing Authority:		Issuing Authority:		Issuing Authority:
Document Number:		Document Number:		Document Number:
Expiration Date (if any)(mm/dd/yyyy):		Expiration Date (if any)(mm/dd/yyyy):		Expiration Date (if any)(mm/dd/yyyy):
Document Title:		<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p>3-D Barcode Do Not Write in This Space</p> </div>		
Issuing Authority:				
Document Number:				
Expiration Date (if any)(mm/dd/yyyy):				
Document Title:				
Issuing Authority:				
Document Number:				
Expiration Date (if any)(mm/dd/yyyy):				

Certification

I attest, under penalty of perjury, that (1) I have examined the document(s) presented by the above-named employee, (2) the above-listed document(s) appear to be genuine and to relate to the employee named, and (3) to the best of my knowledge the employee is authorized to work in the United States.

The employee's first day of employment (mm/dd/yyyy): _____ (See instructions for exemptions.)

Signature of Employer or Authorized Representative		Date (mm/dd/yyyy)	Title of Employer or Authorized Representative	
Last Name (Family Name)		First Name (Given Name)	Employer's Business or Organization Name	
Employer's Business or Organization Address (Street Number and Name)		City or Town	State	Zip Code

Section 3. Reverification and Rehires (To be completed and signed by employer or authorized representative.)

A. New Name (if applicable) Last Name (Family Name) First Name (Given Name) Middle Initial	B. Date of Rehire (if applicable) (mm/dd/yyyy):
--	---

C. If employee's previous grant of employment authorization has expired, provide the information for the document from List A or List C the employee presented that establishes current employment authorization in the space provided below.

Document Title:	Document Number:	Expiration Date (if any)(mm/dd/yyyy):
-----------------	------------------	---------------------------------------

I attest, under penalty of perjury, that to the best of my knowledge, this employee is authorized to work in the United States, and if the employee presented document(s), the document(s) I have examined appear to be genuine and to relate to the individual.

Signature of Employer or Authorized Representative:	Date (mm/dd/yyyy):	Print Name of Employer or Authorized Representative:
---	--------------------	--

LISTS OF ACCEPTABLE DOCUMENTS

All documents must be UNEXPIRED

Employees may present one selection from List A
or a combination of one selection from List B and one selection from List C.

LIST A Documents that Establish Both Identity and Employment Authorization	OR	LIST B Documents that Establish Identity	AND	LIST C Documents that Establish Employment Authorization
<ol style="list-style-type: none"> 1. U.S. Passport or U.S. Passport Card 2. Permanent Resident Card or Alien Registration Receipt Card (Form I-551) 3. Foreign passport that contains a temporary I-551 stamp or temporary I-551 printed notation on a machine-readable immigrant visa 4. Employment Authorization Document that contains a photograph (Form I-766) 5. For a nonimmigrant alien authorized to work for a specific employer because of his or her status: <ol style="list-style-type: none"> a. Foreign passport; and b. Form I-94 or Form I-94A that has the following: <ol style="list-style-type: none"> (1) The same name as the passport; and (2) An endorsement of the alien's nonimmigrant status as long as that period of endorsement has not yet expired and the proposed employment is not in conflict with any restrictions or limitations identified on the form. 6. Passport from the Federated States of Micronesia (FSM) or the Republic of the Marshall Islands (RMI) with Form I-94 or Form I-94A indicating nonimmigrant admission under the Compact of Free Association Between the United States and the FSM or RMI 	OR	<ol style="list-style-type: none"> 1. Driver's license or ID card issued by a State or outlying possession of the United States provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address 2. ID card issued by federal, state or local government agencies or entities, provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address 3. School ID card with a photograph 4. Voter's registration card 5. U.S. Military card or draft record 6. Military dependent's ID card 7. U.S. Coast Guard Merchant Mariner Card 8. Native American tribal document 9. Driver's license issued by a Canadian government authority <li style="text-align: center;">For persons under age 18 who are unable to present a document listed above: 10. School record or report card 11. Clinic, doctor, or hospital record 12. Day-care or nursery school record 	AND	<ol style="list-style-type: none"> 1. A Social Security Account Number card, unless the card includes one of the following restrictions: <ol style="list-style-type: none"> (1) NOT VALID FOR EMPLOYMENT (2) VALID FOR WORK ONLY WITH INS AUTHORIZATION (3) VALID FOR WORK ONLY WITH DHS AUTHORIZATION 2. Certification of Birth Abroad issued by the Department of State (Form FS-545) 3. Certification of Report of Birth issued by the Department of State (Form DS-1350) 4. Original or certified copy of birth certificate issued by a State, county, municipal authority, or territory of the United States bearing an official seal 5. Native American tribal document 6. U.S. Citizen ID Card (Form I-197) 7. Identification Card for Use of Resident Citizen in the United States (Form I-179) 8. Employment authorization document issued by the Department of Homeland Security

Illustrations of many of these documents appear in Part 8 of the Handbook for Employers (M-274).

Refer to Section 2 of the instructions, titled "Employer or Authorized Representative Review and Verification," for more information about acceptable receipts.

FORM 16-1

Certificate of Compliance for LHE and Rigging

This form is applicable to all Contractor Load Handling Equipment (LHE) and Rigging Gear being brought onto the project site and applies to all cranes, derricks and any other hoisting equipment used to lift suspended loads.

This certificate shall be signed by an official of the company that provides LHE/cranes and rigging gear for any application under this contract.

Contracting Officer's Point of Contact:
(Government Designated Representative)

Phone #:

Prime Contractor/Phone #:

Contract Number:

SSHO/QC:

Phone #:

LHE Manufacturer/Type/Capacity:

LHE Operator(s) Name(s):

I certify that:

1. The above noted LHE and all rigging gear conform to the EM 385-1-1, applicable OSHA regulations (host country regulations in foreign countries) and applicable ASME standards.
2. The operator(s) noted above has been trained, qualified and designated in accordance with the requirements in Section 16, EM 385-1-1 for the operation of the above noted LHE.
3. The operator(s) noted above has been trained not to bypass safety devices during LHE operations.
4. The operator(s), rigger(s) and company official (staff) are aware that immediate notification to the GDA of any incident or accident involving this equipment is required.

Company Official Signature:

Date:

Company Official Name/Title:

Post on Crane/LHE.

(In Cab and Contractor's Office for each LHE brought onto USACE Project/Property)

Reset Form

FORM 16-2

Standard Pre-Lift Plan (LHE)/Checklist

Date: _____ Job #: _____ Location: _____

Time: _____ Completed By (Competent Person): _____

Note: Applies to Cranes, Derricks, Hoists and Power-Operated equipment that can be used to hoist, lower and/or horizontally move a suspended load (includes excavators, forklifts, Rough Terrain equipment, etc., when used with rigging).

Crane Considerations		Yes	No
1	Are the lifts within the crane's rated capacities? (based on boom height, radius)	<input type="checkbox"/>	<input type="checkbox"/>
2	Boom deflections considered?	<input type="checkbox"/>	<input type="checkbox"/>
3	Have all potential crane boom obstructions been identified?	<input type="checkbox"/>	<input type="checkbox"/>
4	Have environmental considerations been addressed? (wind, weather, lightning)	<input type="checkbox"/>	<input type="checkbox"/>
5	Have electrical hazards been addressed (overhead /underground) - Clearance distances established? - Is a spotter required? - Public Utility contact required?	<input type="checkbox"/>	<input type="checkbox"/>
6	Crane swing radius properly barricaded and personnel advised of hazards?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
Crane Considerations		Yes	No
1	Weights and Centers of Gravity (COG) have been determined?	<input type="checkbox"/>	<input type="checkbox"/>
2	Anything inside/outside the loads that could shift during the lift?	<input type="checkbox"/>	<input type="checkbox"/>
3	Does rigging need protection from the loads?	<input type="checkbox"/>	<input type="checkbox"/>
4	All anchor bolts, hold-downs, or fasteners have been removed?	<input type="checkbox"/>	<input type="checkbox"/>
5	Potential for binding: are load cells required to verify the loads are free?	<input type="checkbox"/>	<input type="checkbox"/>
6	Attachment points rated to take load weight?	<input type="checkbox"/>	<input type="checkbox"/>
7	Are the loads structurally capable of being lifted? (bending/twisting issues)	<input type="checkbox"/>	<input type="checkbox"/>
8	Is a Critical Lift Plan required per EM 385-1-1, Section 16.H?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

Rigging		Yes	No
1	All rigging has been inspected by a Qualified Rigger?	<input type="checkbox"/>	<input type="checkbox"/>
2	Have sling angles been calculated?	<input type="checkbox"/>	<input type="checkbox"/>
3	Are shackles correctly sized for the sling eyes?	<input type="checkbox"/>	<input type="checkbox"/>
4	Are softeners needed?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
Personnel		Yes	No
1	The roles, responsibilities and qualifications for personnel have been defined? (Operator, Lift Supervisor, Rigger, Signal Person)	<input type="checkbox"/>	<input type="checkbox"/>
2	A Pre-Lift meeting has been conducted?	<input type="checkbox"/>	<input type="checkbox"/>
3	Personnel trained per the EM?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			
Area Preparation		Yes	No
1	The locations for the load landings has been selected and prepared?	<input type="checkbox"/>	<input type="checkbox"/>
2	Blocking and/or cribbing available to set the loads on?	<input type="checkbox"/>	<input type="checkbox"/>
3	Travel paths have been determined and cordoned off?	<input type="checkbox"/>	<input type="checkbox"/>
4	Other personnel in the area have been notified of the lifts?	<input type="checkbox"/>	<input type="checkbox"/>
5	Have ground bearing support questions been addressed?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:			

Crane Operator: _____

Date: _____

Rigger(s): _____

Date: _____

Signal Person: _____

Date: _____

Other: _____

Date: _____

FORM 16-3

Critical Lift Plan

U.S. Army Corps of Engineers CRITICAL LIFT PLAN For use of this form, see EM 385-1-1, Section 16. Proponent agency is Crane HHWG.																																																																																			
Date: _____		Prepared By: _____																																																																																	
Location: _____		USACE District: _____																																																																																	
<p><i>A "critical lift" can be defined as any non-routine crane lift requiring detailed planning and additional or unusual safety precautions. Critical lifts include lifts made where the load weight is greater than 75% of the rated capacity of the crane; lifts which require the load to be lifted, swung or placed out of the operator's view (except Change 6 exemption) ; lifts made with more than one crane; lifts involving non-routine or technically difficult rigging arrangement; hoisting personnel with a</i></p>																																																																																			
A. TOTAL LOAD 1. Load Weight _____ lbs 2. Wt. of Aux. Block _____ lbs 3. Wt. of Main Block _____ lbs 4. Wt. of Lifting Beam _____ lbs 5. Wt. of Sling/Shackles _____ lbs 6. Wt. of Jib/Ext. (erected/stowed) _____ lbs 7. Wt. of Hoist Rope _____ lbs 8. Other: _____ lbs <div style="display: flex; justify-content: flex-end;"> <div style="border: 1px solid black; padding: 2px;"> TOTAL WEIGHT _____ lbs </div> </div> <small>Note: Source of load weight (Drawings, Calcs, etc.) must be attached on Page 2.</small>		E. CRANE PLACEMENT (Mobile Cranes Only) 1. Maximum Bearing Pressure _____ PSF <small>Note: Bearing Pressure Calculations must be attached on Page 3.</small> 2. Ground Conditions Suitable for Load? _____ YES / NO <small>Note: Ground Condition Calculations must be attached on Page 3.</small> 3. High Voltage or Electrical Hazards? _____ YES / NO <small>Note: If Electrical Hazards are present they must be shown on Page 4.</small> 4. Obstructions to Lift or Swing? _____ YES / NO <small>Note: If Obstructions are present they must be shown on Page 4.</small> 5. Travel with Load Required? _____ YES / NO 6. Other? _____																																																																																	
B. CRANE 1. Type of Crane <u>Mobile Hydraulic Truck</u> 2. Maximum Crane Capacity _____ lbs. 3. Radius (Maximum) _____ ft. 4. Radius (Minimum) _____ ft. 5. Boom Length (Maximum) _____ ft. 6. Boom Length (Minimum) _____ ft. 7. Crane Capacity (Max Radius) _____ lbs. 8. Crane Capacity (Min Radius) _____ lbs. 9. Boom Angle (Maximum) _____ deg. 10. Boom Angle (Minimum) _____ deg. 11. Gross Load of Crane _____ lbs. 12. Lift is _____ % of the Crane's rated capacity 13. If Jib/Ext. is to be used: Length _____ ft. Offset _____ ft. 14. Rated Capacity of Jib/Ext. _____ lbs		F. OPERATOR QUALIFICATIONS 1. Certified Operator? _____ YES / NO 2. Option? _____ 3. Certified for Type, Class & Capacity? _____ YES / NO 4. Designated in writing by emp. _____																																																																																	
C. HOIST ROPE <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">Main</td> <td style="width: 25%; text-align: center;">Aux 1</td> <td style="width: 25%; text-align: center;">Aux 2</td> </tr> <tr> <td>1. # of Parts</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. Rope Diameter</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3. Capacity</td> <td></td> <td></td> <td></td> </tr> </table>			Main	Aux 1	Aux 2	1. # of Parts				2. Rope Diameter				3. Capacity				G. PRE-LIFT CHECKLIST <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">(YES)</th> <th style="text-align: center;">N/A</th> <th style="text-align: center;">(NO)</th> </tr> </thead> <tbody> <tr><td>1. Crane Inspected</td><td></td><td></td><td></td></tr> <tr><td>2. Rigging Inspected</td><td></td><td></td><td></td></tr> <tr><td>3. Crane Set-up</td><td></td><td></td><td></td></tr> <tr><td>4. Overhead Hazard Check</td><td></td><td></td><td></td></tr> <tr><td>5. Swing Check</td><td></td><td></td><td></td></tr> <tr><td>6. Counterweight Check</td><td></td><td></td><td></td></tr> <tr><td>7. Operator Qualifications</td><td></td><td></td><td></td></tr> <tr><td>8. Signal Person Qualifications</td><td></td><td></td><td></td></tr> <tr><td>9. Rigger Qualifications</td><td></td><td></td><td></td></tr> <tr><td>10. Load Chart in Crane</td><td></td><td></td><td></td></tr> <tr><td>11. Load Test</td><td></td><td></td><td></td></tr> <tr><td>12. Tag Lines</td><td></td><td></td><td></td></tr> <tr><td>13. Wind Conditions</td><td></td><td></td><td></td></tr> <tr><td>14. Traffic Hazard Check</td><td></td><td></td><td></td></tr> <tr><td>15. Site Control</td><td></td><td></td><td></td></tr> </tbody> </table>			(YES)	N/A	(NO)	1. Crane Inspected				2. Rigging Inspected				3. Crane Set-up				4. Overhead Hazard Check				5. Swing Check				6. Counterweight Check				7. Operator Qualifications				8. Signal Person Qualifications				9. Rigger Qualifications				10. Load Chart in Crane				11. Load Test				12. Tag Lines				13. Wind Conditions				14. Traffic Hazard Check				15. Site Control			
	Main	Aux 1	Aux 2																																																																																
1. # of Parts																																																																																			
2. Rope Diameter																																																																																			
3. Capacity																																																																																			
	(YES)	N/A	(NO)																																																																																
1. Crane Inspected																																																																																			
2. Rigging Inspected																																																																																			
3. Crane Set-up																																																																																			
4. Overhead Hazard Check																																																																																			
5. Swing Check																																																																																			
6. Counterweight Check																																																																																			
7. Operator Qualifications																																																																																			
8. Signal Person Qualifications																																																																																			
9. Rigger Qualifications																																																																																			
10. Load Chart in Crane																																																																																			
11. Load Test																																																																																			
12. Tag Lines																																																																																			
13. Wind Conditions																																																																																			
14. Traffic Hazard Check																																																																																			
15. Site Control																																																																																			
D. RIGGING 1. Hitch Type(s) _____ 2. No. of Slings: _____ Size: _____ 3. Sling Type: _____ 4. Sling Assembly Capacity: _____ lbs. 5. Shackle Size(s): _____ 6. Shackle Rated Capacity(s) _____ lbs.		H. SIGNATURES 1. Crane Operator _____ 2. Rigger _____ 3. Signal Person _____ 4. Lift Supervisor _____ 5. Other _____ 6. Other _____																																																																																	

U.S. Army Corps of Engineers

CRITICAL LIFT PLAN

For use of this form, see EM 385-1-1, Section 16. Proponent agency is Crane HHWG.

LOAD CALCULATIONS

Show here or attach calculations, drawings, etc.

A large grid area for calculations and drawings, consisting of a 30x30 grid of small squares. The grid is empty and occupies the majority of the page's vertical space.

U.S. Army Corps of Engineers

CRITICAL LIFT PLAN

For use of this form, see EM 385-1-1, Section 16. Proponent agency is Crane HHWG.

BEARING PRESSURES & GROUND CONDITIONS

Show here or attach calculations, drawings, etc.

A large grid area for calculations and drawings, consisting of a 30x30 grid of small squares. The grid is intended for showing calculations, drawings, or other technical information related to bearing pressures and ground conditions.

U.S. Army Corps of Engineers

CRITICAL LIFT PLAN

For use of this form, see EM 385-1-1, Section 16. Proponent agency is Crane HHWG.

LOAD CHART

Show here or attach load chart

A large grid area for drawing a load chart. The grid consists of 20 columns and 30 rows of small squares, providing a space for technical drawings or data plots.

U.S. Army Corps of Engineers

CRITICAL LIFT PLAN

For use of this form, see EM 385-1-1, Section 16. Proponent agency is Crane HHWG.

OPERATOR, RIGGER, SINGAL PERSON QUALIFICATIONS

Show here or attach operator qualifications

A large grid area for entering operator qualifications. The grid consists of 20 columns and 30 rows of small squares, providing a structured space for handwritten or typed information.

U.S. Army Corps of Engineers

CRITICAL LIFT PLAN

For use of this form, see EM 385-1-1, Section 16. Proponent agency is Crane HHWG.

SITE PLAN

Show here or attach site plan and sequencing

A large grid area for drawing the site plan and sequencing. The grid consists of 30 columns and 30 rows of small squares, providing a space for technical drawings and diagrams.

REAL PROPERTY INVENTORY

ITEM	TALLY	TOTAL
WASH BASIN		
AIR COMPRESSOR		
HOISTS		
INVENTORY BY:		DATA:
RECONCILED BY:		DATA:

DIRECTORATE OF ENGINEERING & HOUSING EXCAVATION PERMIT

FB Reg 420-13

DATE

1. CLEARANCE IS REQUIRED TO PROCEED WITH WORK AT

ON WORK ORDER NO _____ CONTRACT NO _____

2. METHOD OF EXCAVATION	A. HAND	B. POWER SHOVEL	C. DITCHER	D. OTHER (SPECIFY)
-------------------------	---------	-----------------	------------	--------------------

3. SCOPE OF WORK (DEPTH, WIDTH, LENGTH, LOCATION, AND SKETCH AS APPLICABLE)
IF CONTRACT A COPY OF APPLICABLE DRAWINGS OR SKETCHES MUST BE ATTACHED.

4. DATE CLEARANCE REQUESTED

5. TERMINATION DATE OF CLEARANCE (60 DAYS UNLESS SPECIFIED)

6. REQUESTING ORGANIZATION OR COMPANY

7. PHONE NUMBER

8. SIGNATURE (REQUESTING OFFICIAL)

9. EXCAVATION CLEARANCE APPROVAL

UTILITY	REMARKS	SIGNATURE OF APPROVING OFFICIAL	DATE
ELECTRICAL UNDERGROUND DISTRIBUTION			
STEAM OR HTW DISTRIBUTION			
CHILLER DISTRIBUTION			
SEWER LINES			
WATER DISTRIBUTION			
NATURAL GAS DISTRIBUTION			
TELEPHONE (DOIM)			
OTHER			
TELEPHONE (CT&T)			

FORT BRAGG ASBESTOS REMOVAL, TRANSPORTATION, AND
DISPOSAL DOCUMENTATION FORM

1. REMOVAL: ON _____ (SY/LF/CF/OR POUNDS) OF
ASBESTOS CONTAINING MATERIAL REMOVED FROM BUILDING #_____,
_____ (STREET ADDRESS), FORT BRAGG, NC, PER
_____ (WORK ORDER/CONTRACT NUMBER) WAS PREPARED FOR MOVEMENT TO THE
LANDFILL UNDER THE SUPERVISION OF _____ (PRINT NAME OF
SUPERVISOR) REPRESENTING _____ (NAME OF
FIRM/ORGANIZATION.

_____ (SIGNATURE OF SUPERVISOR)

2. TRANSPORTATION: ON _____ THE ACM MENTIONED ABOVE WAS TRANSPORTED
ON THE VEHICLE AUTHORIZED BY LANDFILL VEHICLE PERMIT NUMBER _____ BY
_____ (PRINT NAME OF DRIVER) _____ (SIGNATURE
OF DRIVER) TO THE LONGSTREET LANDFILL ON LONGSTREET ROAD, FORT BRAGG, NC.

3. DISPOSAL: THE ACM DESCRIBED IN PARAGRAPH 1 WAS DELIVERED BY THE VEHICLE
IDENTIFIED ABOVE TO THE LONGSTREET LANDFILL AND RECEIVED BY
_____ (PRINT NAME OF LANDFILL OPERATOR)

I CERTIFY THAT THE LANDFILL HAS BEEN APPROVED FOR THE DISPOSAL OF ASBESTOS.
THE MATERIAL DELIVERED WILL BE COVERED WITH NONASBESTOS MATERIAL IN THE
PRESCRIBED MANNER.

(PRINT NAME OF OPERATOR)

(SIGNATURE)

(DATE)

REQUEST FOR A FORT BRAGG INSTALLATION ACCESS CONTROL BADGE

PRIVACY ACT ADVISEMENT: The information requested is for the purpose of granting access to the Fort Bragg Installation. Providing requested information, to include your social security number (SSN), is voluntary. However, your access may not be granted if all requested information is not provided. **AUTHORITIES:** Executive Orders (EO) 10450, 10865, and 12333. The SSN, required for record accuracy, is requested pursuant to EO 9397.

1. APPLICANT INFORMATION:

LAST Name: _____ FIRST Name: _____ MIDDLE Initial: _____

Grade/Rank/Status: _____ Social Security Number: _____ DOB: _____

Gender Male Female Driver's License # _____

Organization/Unit: _____ Organization/Unit Phone Number: _____

E-Mail Address: _____ Relationship to Sponsor: _____

2. REQUESTED BADGE: Non-DoD Contractor Foreign National Friend Partners of Bragg Vendor Family Care Provider

Requested Date(s)/Time(s) of Visit: _____

Contract Period (from/to dates) Contractor/Vendor use as applicable: _____

3. JUSTIFICATION FOR BADGE: _____

4. SPONSOR INFORMATION:

LAST Name: _____ FIRST Name: _____ MIDDLE Initial: _____

Grade/Rank/Status: _____ DOB: _____

Gender Male Female Driver's License # _____

Organization/Unit: _____ Organization/Unit Phone Number: _____

E-Mail Address: _____

5. COMMANDER'S/DIRECTOR'S/FACILITY MANAGER'S CERTIFICATION:

I certify that the applicant meets the justification requirements as indicated in paragraph 3 above for access privileges. Furthermore, I certify that the applicant requires an access control badge as indicated above in order to perform assigned duties or conduct official business on Fort Bragg.

BDE/BN CDRs, XOs/Directors, Deputy Directors/
Contracting Officer Representative
(Invalid if incomplete)

Printed Name/Rank/Telephone No.
(Invalid if incomplete)

SECTION BELOW IS FOR USE BY THE INSTALLATION ACCESS CONTROL OFFICE ONLY

6. ISSUING OFFICIAL:

Approved/Disapproved (circle one) _____ Issuing Official Printed Name _____ Issuing Official Signature _____

Date: _____

AUTOMATED INSTALLATION ENTRY (AIE) BADGE REQUEST

Last Name	First Name	M.I.	Grade/Rank/ Status	Date of Birth	Gender (Male / Female)	Driver's License #	Organization	Organization Phone #	Relationship to Sponsor (Spouse/Dependent/ Friend, etc.)
X	X	X	Contractor	1/1/1111	M	NC-xxx	X	123-456-7890	Contractor
			Contractor						Contractor
			Contractor						Contractor
			Contractor						Contractor
			Contractor						Contractor
			Contractor						Contractor
Names in Yellow are renewals of expiring/expired cards									

Annex B FB 15-003

Updated Personal Identity Verification of Contractor Personnel for Automated Installations Entry (AIE) Cards/Pass

Unclassified//For Official Use Only

Date:

52.204-9 Personal Identity Verification of Contractor Personnel. As prescribed in 4.1303, insert the following clause:

1. Personal Identity Verification of Contractor Personnel (JAN 2011)

(a) The Contractor shall comply with agency personal identity verification procedures identified in the contract that implement Homeland Security Presidential Directive-12 (HSPD-12), Office of Management and Budget (OMB) guidance M-05-24, and Federal Information Processing Standards Publication (FIPS PUB) Number 201.

(b) The Contractor shall account for all forms of Government-provided identification issued to the Contractor employees in connection with performance under this contract. The Contractor shall return such identification to the issuing agency at the earliest of any of the following, unless otherwise determined by the Government:

- (1) When no longer needed for contract performance.
- (2) Upon completion of the Contractor employee's employment.
- (3) Upon contract completion or termination.

(c) The Contracting Officer may delay final payment under a contract if the Contractor fails to comply with these requirements.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in all subcontracts when the subcontractor's employees are required to have routine physical access to a Federally-controlled facility and/or routine access to a Federally-controlled information system. It shall be the responsibility of the prime Contractor to return such identification to the issuing agency in accordance with the terms set forth in paragraph (b) of this section, unless otherwise approved in writing by the Contracting Officer.

(End of clause)

(e) In addition to the aforementioned, the contractor will provide the Contractor Officer Representative (COR) a monthly status report on all forms of Government-provided identification issued to the contractor employees in connection with performance under this contract.

- (1) The COR will provide the Installation Physical Security Division a copy of the monthly status report for any termination requirements.
 - (2) Monthly status reports will be maintained on file for one year after contract completion by the Sponsoring Agency.
- (f) The template below will be used for the monthly status report submission.

Annex B FB 15-003

Updated Personal Identity Verification of Contractor Personnel for Automated Installations Entry (AIE) Cards/Pass

Unclassified//For Official Use Only

Date:

		X.X				
		X.X				
		X.X				
		X.X				
		X.X				
		X.X				
		X.X				

2. Penalties: Contractor failure to submit the monthly CAC and/or AIE Badge report will result in one of the following penalties levied against the contract:

- (a) US Government withholding payment on the contract.
- (b) A fine of \$500.00 – \$3,000.00 will be assessed per incident, based upon the severity and frequency of which they occur and will continue for each calendar day until compliance is met.
- (c) If the Government terminates the Contractor’s right to proceed, fines continue to accrue until compliance is met.

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with a covered Federal action. Use the SF-LLL-A Continuation Sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, state and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee", then enter the full name, address, city, state and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, state and zip code of the lobbying entity engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individuals(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (item 4) to the lobbying entity (item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
12. Check the appropriate box(es). Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
13. Check the appropriate box(es). Check all boxes that apply. If other, specify nature.

Provide a specific and detailed description of the services that the lobbyist has performed, or will be expected to perform, and the date(s) of any services rendered. Include all preparatory and related activity, not just time spent in

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503.

**DISCLOSURE OF LOBBYING ACTIVITIES
CONTINUATION SHEET**

Approved by
OM
0348-0046

Reporting Entity: _____ Page _____ of _____

CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG
(EPRCA)

PRIME COMPANY NAME: _____

CONTRACT NO: _____

PROJECT TITLE / LOCATION: _____

Material Name	Manufacturer	MSDS Number	State (i.e. Liquid, Solid, Gas)	Storage Quantity		Quality (lbs/gals) used in Calendar Year []
				Average Daily	Max Daily	

Contractor(s) certifies that the hazardous material(s) removed from installation will be used/reused for its intended purpose.

Company Using Material Listed Above

Company

Company Representative's Signature

Submitted By: _____
Printed Name

Phone: _____

Fax: _____

Date: _____

Contracting Officer _____

Phone: _____

Fax: _____

Page ____ of ____

CONTRACTOR-FURNISHED SPOIL, DISPOSAL AREAS

This bid under Invitation No. _____
Fill in solicitation Number

for _____
List Title of solicitation

is based on using the following spoil disposal area(s) which are not shown on the contract drawings.

1. DESCRIPTION:

2. LOCATION:

3. OWNER AND ADDRESS:

4. SIZE OF AREA(S):

5. FILL HEIGHT OR OTHER SPOILING RESTRICTIONS:

6. CAPACITY OF AREA(S) (Cu. Yds.):

7. TIME LIMITATION FOR USE OF AREA(S):

8. NUMBER AND TYPE OF ROAD CROSSING(S) REQUIRED:

9. DIKING REQUIRED:

10. PLANNED LOCATION OF SPILLWAY(S):

Written evidence of consent by owner(s) for use of spoil disposal area(s) is attached.

Written evidence of the consent of the owner(s) for use of property involved in obtaining access to the spoil disposal areas is attached.

Written evidence of consent for the use of such disposal area(s) by applicable conservation and pollution agencies are attached.

Sketch(es), to the same scale as the contract drawings, showing the location(s) of spoil area(s) to be used and access thereto are attached.

Name of Company

Signature of Bidder

Date

APPENDIX B

ENVIRONMENTAL INFORMATION



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
INSTALLATIONS, ENERGY AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON, DC 20310-0110

SAIE-IHP

MAY 04 2023

MEMORANDUM FOR

Headquarters, U.S. Army Materiel Command, AMIL, 4400 Martin Road, Redstone Arsenal, AL 35898

SUBJECT: Request for Approval of a Finding of No Practicable Alternative (FONPA) for Construction and Operation of a Multipurpose Training Range (MPTR) and Fielding the Mobile Protected Firepower (MPF) Vehicle at Fort Bragg, NC.

1. Reference – AMIL-EED memorandum, dated 3 Feb 2023, SUBJECT: Request Approval of a Finding of No Practicable Alternative (FONPA) under Executive Order 11990 for Construction and Operation of a Multipurpose Training Range (MPTR) and Fielding the Mobile Protected Firepower (MPF) Vehicle at Fort Bragg, NC.
2. As requested in referenced memorandum, the FONPA for Construction and Operation of MPTR and Fielding the MPF is approved.
3. The points of contact for this action are Ms. Denise Faldowski, ODASA (IH&P), at denise.m.faldowski.civ@army.mil and Ms. Mary Schmidt, ODCS, G-9, at mary.e.schmidt37.civ@army.mil.

A handwritten signature in black ink, appearing to read "Carla Coulson", is positioned above the typed name.

Carla Coulson

Deputy Assistant Secretary of the Army
(Installations, Housing, and Partnerships)

CF:
DCS, G-9 (DAIN-ISE)

FINAL
Fort Bragg MPTR
MEC Recon Letter Report
March 16, 2020

Personnel: Thomas Meeks & John Zimmer, OE Safety
Jason Burcham & Brian Hamilton – Data Collectors

Survey Dates: November 4-8, 2019

Project: Munitions and Explosives of Concern (MEC) Reconnaissance (Recon) of proposed Multi-Purpose Training Range (MPTR), Fort Bragg, NC

Fort Bragg POC: Wolf Amacker – Range Control

Field Activities: The US Army Corps of Engineers Huntsville Center (CEHNC) mobilized two recon teams to traverse the footprint for proposed MPTR. The team arrived at the Fort Bragg range control office the morning of November 4, 2019. Mr. Wolf Amacker briefed the teams and arranged site access. Two Schonstedt GA52-CX Magnetometers on setting 4 were utilized during the MEC Recon. Approximately 865 acres were surveyed for the project. Data was collected approximately every 50 meters. 869 data points were collected and 29.75 miles of transects were traversed. See Attachment 1 for site acreage, recon path and perceived site risk. Photographs were taken to display site conditions and significant items observed. See Attachment 2 to view the site photos.

Technical Discussion: The site is located in the southwest portion of Fort Bragg Installation. The teams swept an unbiased uniform coverage of the footprint. The magnetometers detect ferrous objects within the transect path. A MEC simulant was swept on the surface before and after fieldwork activities each day. The detectors passed all functionality tests. All visible metallic surface items were entered into the dataset and all observed subsurface anomalies were recorded. Low subsurface anomaly counts were observed throughout the site. No Dud producing targets or training areas were observed. Small arms debris, flares, range related debris and berms were the only notable items observed. Contractors harvest pine straw throughout the footprint with no known ordnance related incidences.

Site History: No documented site history has been recovered. No known UXO incidences have occurred within the project footprint. Currently the site is used for bivouac area.

Conclusion/Recommendations: Based on the field observations, the site is perceived as **low risk area** for MEC exposure. **Contractor awareness training** is recommended during construction. Note: Explosive hazards can exist anywhere on a military installation with extensive munitions use history. Continued use of the active portions of the proposed footprint can introduce MEC items that were not present during the recon.

Attachment 1 –Risk Map
Attachment 2 - Photos
Attachment 3 – Data Table

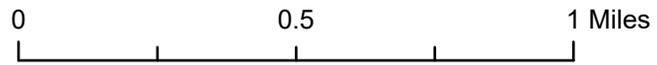
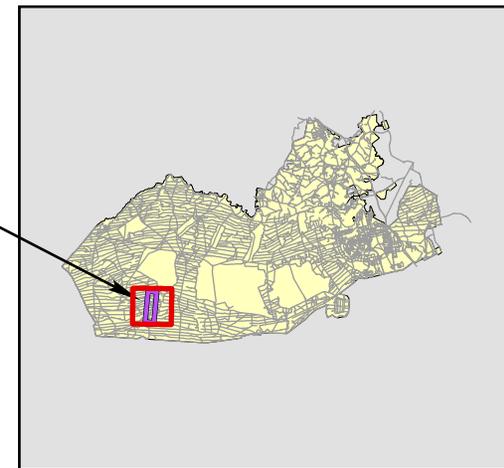
Attachment 1 MPTR Coverage Fort Bragg, NC

Legend

- Data Collection Point (869 Points)
- ⋈ Walked Path (29.75 miles)
- ▭ Proposed Recon Area (864.89 Acres)
- ▨ Low Risk of Encountering MEC

Discovered Items

- ⋈ Berm
- ⋈ Commo Wire
- ⋈ Concertina Wire
- ◇ Flare
- () Grenade Casings
- ⋈ Small Arm Blank
- ≡ Small Arm Casings
- ≡ Small Arm Links
- ▷ Small Arm Projectile
- ⋈ Wire



Spatial Reference
Name: WGS 1984 Web Mercator Auxiliary Sphere

Date/Time: 3/16/2020 10:53 AM - KDA



**U.S. Army Engineering &
Support Center Huntsville**



DISCLAIMER - The data represent the results of data collection/processing for a specific U.S. Army Corps of Engineers activity and indicates the general existing conditions. As such, it is only valid for its intended use, content, time and accuracy specifications. The user is responsible for the results of any application of the data for other than its intended purpose.

Fort Bragg MPTR MEC Recon Photos



2019-11-04 1:24 PM
Lat: 35° 3' 51.3714" N
Lon: 79° 16' 5.3814" W
team2_0072

Lunch Area for Onsite Workers



2019-11-04 1:53 PM
Lat: 35° 4' 0.9642" N
Lon: 79° 15' 33.6626" W
team2_0073

Markers for Environmental Constraints



2019-11-04 1:47 PM
Lat: 35° 4' 0.6498" N
Lon: 79° 15' 57.7002" W
team2_0074

Dug Pit With Pine Straw



2019-11-05 8:42 AM
Lat: 35° 4' 19.6128" N
Lon: 79° 15' 46.8842" W
team2_0075

Catch Station

Fort Bragg MPTR MEC Recon Photos



Concertina Wire



Existing Structures



Existing Structures



Simulator

Fort Bragg MPTR MEC Recon Photos



Berm



Berm



Fighting Position



Marker

Point ID	collectDate	teamLead	instln_id	instln_nam	projNum	siteName	subEM	subMAG	surfHits	mppeh	fe	nonFe	uxo	dmm	md	rrd	cd	pntType	desc1	desc1CNT	desc2	desc2CNT	desc3	desc3CNT	desc4	desc4CNT	desc5	desc5CNT	desc6	desc6CNT	desc7	desc7CNT	desc8	desc8CNT	notes	POINT_X	POINT_Y
0	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	Start point	657184.1	3881312.1	
1	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	2	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657239.6	3881294.4
2	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	2	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657290.8	3881299
3	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	1	0	10	0	0	0	0	0	0	10	0	0	0	0	Recon Point	Small Arm Blank	10		0		0		0		0		0		0		0	657345.9	3881294
4	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	1	0	0	0	0	0	0	1	0	0	0	0	Recon Point	Flare	1		0		0		0		0		0		0		0	657391.8	3881296.7
5	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657448.6	3881285.9
6	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657489.5	3881279.4
7	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657539.7	3881277.3
8	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657588.5	3881272.5
9	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657637	3881260.8
10	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657682.4	3881271.9
11	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	5	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657734.5	3881263
12	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657787.9	3881250.8
13	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	5	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657842.2	3881243.6
14	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	4	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657890.3	3881240.3
15	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657937.7	3881243.9
16	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657987.9	3881242.2
17	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658039.8	3881245.3
18	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658082.5	3881233.7
19	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658135.2	3881233.4
20	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658184.8	3881230.5
21	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	2	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658185	3881283.5
22	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658184.6	3881331.6
23	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658136	3881331.8
24	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658083.4	3881333.5
25	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658027.3	3881333.5
26	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657987.1	3881341.6
27	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	2	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657933	3881338.3
28	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657882.7	3881347.2
29	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	2	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657834.5	3881347
30	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657787.4	3881356.5
31	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657731.6	3881349.1
32	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657686.7	3881359.3
33	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657636.5	3881368.2
34	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657582.7	3881366.6
35	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657535.5	3881375.4
36	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657485.5	3881377.9
37	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657435.4	3881384.8
38	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657384.9	3881389.5
39	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657336.4	3881390.8
40	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657283.5	3881401
41	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657242.5	3881391.7
42	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657191.9	3881399.6
43	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657188	3881462.3
44	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657205.9	3881503.8
45	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657201.6	3881556.6
46	2019-11-04	JASON BURCH#37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0												

Point ID	collectDate	teamLead	instln_id	instln_nam	projNum	siteName	subEM	subMAG	surfHits	mppeh	fe	nonFe	uxo	dmm	md	rrd	cd	pntType	desc1	desc1CNT	desc2	desc2CNT	desc3	desc3CNT	desc4	desc4CNT	desc5	desc5CNT	desc6	desc6CNT	desc7	desc7CNT	desc8	desc8CNT	notes	POINT_X	POINT_Y
179	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657730.6	3882562.2
180	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657673.6	3882568.8
181	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657630.7	3882570.8
182	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657578.3	3882579.9
183	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657531.8	3882580.7
184	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657482.6	3882589.2
185	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657432.9	3882590.2
186	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	1	0	0	0	0	0	0	0	0	0	Recon Point	Flare	1		0		0		0		0		0		0		0	657377.4	3882589.8
187	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657333	3882581
188	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657280.6	3882588
189	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657284.6	3882658.9
190	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657290.5	3882718.3
191	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657295.7	3882762.3
192	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657294.3	3882804
193	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657296.9	3882854.9
194	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657303	3882901.7
195	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657364	3882888.6
196	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657417.4	3882871.2
197	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	1	0	0	0	0	0	0	0	0	1	Recon Point		0		0		0		0		0		0		0		0	657467.9	3882884.7
198	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657509.9	3882873.6
199	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657565.1	3882864.6
200	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657617.0	3882866.6
201	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657664.7	3882861.7
202	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657715.4	3882850.8
203	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657764.3	3882860
204	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657813.1	3882855.9
205	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657870.2	3882850.3
206	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657911.2	3882848.6
207	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657963.8	3882841.5
208	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658012.9	3882846.4
209	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658060.6	3882844.1
210	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658112	3882832.7
211	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658168.2	3882827.5
212	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658214.2	3882823.8
213	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658262.2	3882820
214	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658316.9	3882817.7
215	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658321.8	3882877.2
216	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658310.7	3882926.3
217	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658262.6	3882928.2
218	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658208.3	3882933.8
219	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658156.8	3882929
220	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658111.2	3882928.9
221	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658061.9	3882940.5
222	2019-11-05	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658012.6	3882948.1
223	2019-11-06	JASON BURCHA	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657961.9	3882947.8
224	2019-11-06	JASON BURCHA	37225	Fort Bragg		MPTR	0	2	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657907.2	3882956.4
225	2019-11-06	JASON BURCHA	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657860.8	3882954.4
226	2019-11-06	JASON BURCHA	37225	Fort Bragg		MPTR</																															

Point ID	collectDate	teamLead	instln_id	instln_nam	projNum	siteName	subEM	subMAG	surfHits	mppeh	fe	nonFe	uxo	dmm	md	rrd	cd	pntType	desc1	desc1CNT	desc2	desc2CNT	desc3	desc3CNT	desc4	desc4CNT	desc5	desc5CNT	desc6	desc6CNT	desc7	desc7CNT	desc8	desc8CNT	notes	POINT_X	POINT_Y
268	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658135.4	3883334.4		
269	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658095.1	3883344.3		
270	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658037.3	3883351.6		
271	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657991.7	3883358.7		
272	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657939.1	3883353.5		
273	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657893.1	3883355.5		
274	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657838.8	3883360.1		
275	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657791.8	3883351.6		
276	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657745.6	3883371.6		
277	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657688.6	3883368.6		
278	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657641.9	3883361.8		
279	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657591.1	3883373.9		
280	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657540.1	3883383.2		
281	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	1	0	0	0	0	0	1	0	0	0	Recon Point	Small Arm Projectile	1		0		0		0		0		0		0	657490.7	3883377.6		
282	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657445.4	3883398.8		
283	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657397	3883393.7		
284	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657351.8	3883408.1		
285	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657348.4	3883454.4		
286	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657353.6	3883502.8		
287	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657352.6	3883550.9		
288	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657368.2	3883596.6		
289	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657382.3	3883646.7		
290	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657399.4	3883699.1		
291	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657476.1	3883691.1		
292	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657525.2	3883682.9		
293	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657573.1	3883674.6		
294	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657623.6	3883686.3		
295	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657672.7	3883674.3		
296	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657725.7	3883667.9		
297	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657774.4	3883675.5		
298	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657827.5	3883661.4		
299	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657875.1	3883659.4		
300	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657923.9	3883648.6		
301	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	657971.3	3883656.3		
302	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658017.7	3883646.1		
303	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658066.4	3883650.7		
304	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658122.3	3883648.8		
305	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658174.3	3883640.3		
306	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658223.2	3883625.4		
307	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658274.4	3883623.7		
308	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658325.3	3883626.9		
309	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658373.4	3883619.2		
310	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658426.8	3883656.6		
311	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658464.6	3883710.3		
312	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658446.9	3883770.5		
313	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658385.1	3883789.9		
314	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	2	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658326.3	3883790.1		
315	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	2	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0	658280.1	3883770.6		
316	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	50	0	0	0	0	0	50	0	0	0	Recon Point	Small Arm Blank	50		0		0		0		0		0		0	active biVOUAC area	658224.3	3883736.5	
317	2019-1																																				

Point ID	collectDate	teamLead	instln_id	instln_nam	projNum	siteName	subEM	subMAG	surfHits	mppeh	fe	nonFe	uxo	dmm	md	rrd	cd	pntType	desc1	desc1CNT	desc2	desc2CNT	desc3	desc3CNT	desc4	desc4CNT	desc5	desc5CNT	desc6	desc6CNT	desc7	desc7CNT	desc8	desc8CNT	notes	POINT_X	POINT_Y
357	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658253.5	3884027.4
358	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658312.9	3884030.2
359	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658355.8	3884027.9
360	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	2	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658404.1	3884019.5
361	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658396.9	3884075.3
362	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658399.7	3884123.1
363	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658354.3	3884125.4
364	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658300.3	3884128.3
365	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658248.9	3884127.8
366	2019-11-06	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658221.7	3884143.1
367	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	3	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658151.6	3884136.1
368	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658105.4	3884152.6
369	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658055.1	3884144.4
370	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657998.8	3884138.9
371	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657949	3884155.6
372	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657908.1	3884156.7
373	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657851.5	3884156.5
374	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657806.3	3884161.3
375	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657756.2	3884154.9
376	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657706.2	3884173.5
377	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657650.8	3884180.6
378	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657595.2	3884187.6
379	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657551.2	3884192
380	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	1	0	0	0	0	0	0	0	0	1	Recon Point		0		0		0		0		0		0		0		0	657502.7	3884194.9
381	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657452.8	3884192.9
382	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657407.1	3884190.3
383	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657415.1	3884246.7
384	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	1	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657432.9	3884298
385	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657422.1	3884345.3
386	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657414.7	3884396.7
387	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657430.8	3884445.7
388	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657446.2	3884493.5
389	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657486.7	3884497.7
390	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657537.9	3884477.5
391	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657591.5	3884479.4
392	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657644.4	3884473.9
393	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657687.3	3884462.5
394	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657743.6	3884460.8
395	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657793.1	3884459.8
396	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657838.9	3884464.2
397	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657880.4	3884463.3
398	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657940.8	3884461
399	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657986.8	3884452.3
400	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658040.2	3884446
401	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658086.5	3884447.1
402	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658138.6	3884443.5
403	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658182.9	3884435.3
404	2019-11-07	JASON BURCH	37225	Fort Bragg		MPTR																															

Point ID	collectDate	teamLead	instln_id	instln_nam	projNum	siteName	subEM	subMAG	surfHits	mppeh	fe	nonFe	uxo	dmm	md	rrd	cd	pntType	desc1	desc1CNT	desc2	desc2CNT	desc3	desc3CNT	desc4	desc4CNT	desc5	desc5CNT	desc6	desc6CNT	desc7	desc7CNT	desc8	desc8CNT	notes	POINT_X	POINT_Y
535	2019-11-04	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657592.7	3881977.2
536	2019-11-04	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657641.1	3881965.2
537	2019-11-04	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657684.4	3881966.4
538	2019-11-04	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657718.5	3881947.3
539	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657740	3881961.1
540	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	1	0	0	0	0	0	0	0	0	1	0	0	Recon Point	Concertina Wire	1		0		0		0		0		0		0		0	657788	3881968.2
541	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657849.2	3881981.7
542	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657886.9	3881944.9
543	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657944.3	3881939.3
544	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657992.8	3881955.2
545	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658039.4	3881953.4
546	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658095.5	3881964.2
547	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658132.9	3881929.6
548	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658146.3	3881911.3
549	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658196.3	3881906.2
550	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658247.2	3881906.7
551	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658287.2	3881915.5
552	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658337.3	3881911.4
553	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658341.7	3881972.4
554	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658341.3	3882027.5
555	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658336.3	3882082.2
556	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658354	3882127
557	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658342.3	3882180.2
558	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658356.5	3882225
559	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658285.5	3882245.9
560	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658249.3	3882235
561	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658200.1	3882232.3
562	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658152.3	3882223.2
563	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658094	3882231.9
564	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	1	0	0	0	0	0	0	0	0	1	0	0	Recon Point	Flare	1		0		0		0		0		0		0		0	658058	3882239.3
565	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658002	3882246.7
566	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657947.5	3882247.8
567	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657903.3	3882240.5
568	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657862.4	3882266.7
569	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657807.4	3882280.7
570	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657752.3	3882262.2
571	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657687.3	3882253.4
572	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657644.8	3882260.6
573	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657617.9	3882270
574	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657577.1	3882294.1
575	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657502.2	3882275.1
576	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657452.6	3882293.4
577	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657430.3	3882299.4
578	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657411.8	3882342.1
579	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657426.4	3882391.5
580	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657469.9	3882402.3
581	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0</																													

Point ID	collectDate	teamLead	instln_id	instln_nam	projNum	siteName	subEM	subMAG	surfHits	mppeh	fe	nonFe	uxo	dmm	md	rrd	cd	pntType	desc1	desc1CNT	desc2	desc2CNT	desc3	desc3CNT	desc4	desc4CNT	desc5	desc5CNT	desc6	desc6CNT	desc7	desc7CNT	desc8	desc8CNT	notes	POINT_X	POINT_Y
624	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657441.4	3882685.1
625	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657380.3	3882687.4
626	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657403.2	3882740.9
627	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657407.7	3882790.7
628	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657451.8	3882791.4
629	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657502.7	3882785.2
630	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657552	3882770.8
631	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657600	3882780.8
632	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657659.5	3882760.9
633	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657706.7	3882760.1
634	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657750.2	3882760.3
635	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657810.6	3882757.6
636	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	2	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657851.3	3882763.7
637	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657901.8	3882762.6
638	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657952.7	3882754.4
639	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658003.8	3882746.8
640	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658056.6	3882750.6
641	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658100.8	3882747.1
642	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	1	0	0	0	0	0	0	0	0	1	0	0	Recon Point		0		0		0		0		0		0		0		0	658159.1	3882721.1
643	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658203	3882724.2
644	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658249.9	3882717.8
645	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658303.6	3882723.6
646	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	1	0	0	0	0	0	0	0	0	1	0	0	Recon Point	Wire	1		0		0		0		0		0		0		0	658350.3	3882730.1
647	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658399.3	3882712.8
648	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658405.6	3882768
649	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658402.5	3882818.9
650	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658400.6	3882869.9
651	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	1	0	0	0	0	0	0	0	0	1	0	0	Recon Point		0		0		0		0		0		0		0		0	658405.5	3882917.9
652	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658424.4	3882979.6
653	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658430.3	3883021.4
654	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658365.3	3883032.3
655	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658311.8	3883043.1
656	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658266.2	3883033.5
657	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658212.9	3883034.4
658	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658167.1	3883015.8
659	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658121.1	3883042.6
660	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658062.1	3883054.9
661	2019-11-05	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658003.3	3883052.6
662	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	658004.1	3883049.9
663	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657965.2	3883045.4
664	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657912.9	3883042.8
665	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657873.2	3883044.1
666	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657815.9	3883047.3
667	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657768.9	3883058.4
668	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657727	3883071.4
669	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Recon Point		0		0		0		0		0		0		0		0	657667.8	3883070.3
670	2019-11-06	BRIAN HAMILTC37225	Fort Bragg	MPTR	0	0	0	0	0																												

**ENVIRONMENTAL ASSESSMENT
and
DRAFT MITIGATED FINDING OF NO SIGNIFICANT IMPACT
for
THE CONSTRUCTION AND OPERATION OF A MULTIPURPOSE TRAINING
RANGE AND FIELDING THE MOBILE PROTECTED FIREPOWER VEHICLE
at FORT BRAGG, NORTH CAROLINA**



*The Right Way.
The Green Way.
All the Way.*

August 2022

Prepared by the:

Department of the Army
US Army Installation Management Command
Headquarters, United States Army Garrison
ATTN: AMIM-BGP-EM
Fort Bragg, North Carolina 28310

In accordance with the
National Environmental Policy Act of 1969

**ENVIRONMENTAL ASSESSMENT
and
DRAFT MITIGATED FINDING OF NO SIGNIFICANT IMPACT
for
THE CONSTRUCTION AND OPERATION OF A MULTIPURPOSE TRAINING
RANGE AND FIELDING THE MOBILE PROTECTED FIREPOWER VEHICLE
at FORT BRAGG, NORTH CAROLINA**

SIGNATURES

Prepared By:

CARSWELL,VIRGINIA.L.1263510603
Digitally signed by
CARSWELL,VIRGINIA.L.126351
0603
Date: 2022.08.10 08:42:24 -04'00'

GINNY CARSWELL
NEPA Coordinator

Date:

Environmental Review:

HEINS.DAVID.ALEXANDER.1197486895
Digitally signed by
HEINS.DAVID.ALEXANDER.119
7486895
Date: 2022.08.10 09:52:34 -04'00'

DAVID A. HEINS
Chief, Environmental Division

Date:

Proponent:

BROWN,AARON.S.1258942732
Digitally signed by
BROWN,AARON.S.1258942732
Date: 2022.08.11 09:29:10 -04'00'

AARON S. BROWN
Director of Public Works

Date:

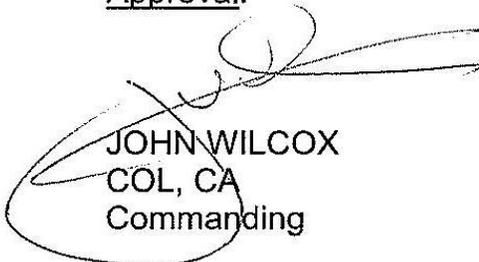
Legal Review:

KANABROCKI,MICHAEL.L.1019989913
Digitally signed by
KANABROCKI,MICHAEL.L.1019
989913
Date: 2022.08.10 09:25:49 -04'00'

MICHAEL L. KANABROCKI
Chief, Civil Law Division

Date:

Approval:


JOHN WILCOX
COL, CA
Commanding

Date: 16 Aug 2022

**ENVIRONMENTAL ASSESSMENT
and
DRAFT MITIGATED FINDING OF NO SIGNIFICANT IMPACT
for
THE CONSTRUCTION AND OPERATION OF A MULTIPURPOSE TRAINING
RANGE AND FIELDING THE MOBILE PROTECTED FIREPOWER VEHICLE
at FORT BRAGG, NORTH CAROLINA
EXECUTIVE SUMMARY**

This environmental assessment (EA) provides an analysis of the environmental and socioeconomic effects of the following proposed actions. This EA is being undertaken in accordance with the National Environmental Policy Act of 1969 (NEPA) and Title 32 of the Code of Federal Regulations, Part 651, to inform decision makers and the public of likely environmental consequences of the proposed actions and alternatives and provide a forum for public feedback.

1. Proposed Action. The proposed action is for the construction and operation of a multipurpose training range (MPTR; Project Number 96182) at Fort Bragg, North Carolina in FY (fiscal year) 2023. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours. Fort Bragg is deficient of mounted gunnery ranges according to the 8-9 October 2019 planning charrette lead by the Department of the Army (DA) Combined Arms Center. Fort Bragg requires a mounted gunnery range allowing long-distance firing for training and qualification. The proposed automated range would support mounted vehicles to include the new mobile protected firepower (MPF) vehicle; no existing Fort Bragg range can support MPF firing and training requirements. The 82nd Airborne Division would receive a MPF battalion and the MPF companies would maintain a tactical alignment with the IBCTs. The MPF is capable of firing rounds following gunnery standards for the mobile gun system (MGS or M1). A Soldier Vehicle Assessment and Limited User Test (LUT) of MPF prototypes were conducted on Fort Bragg in FY2020 and FY2021. Live-fire activities associated with the LUT transpired at Fort Stewart, Georgia, due to Fort Bragg's inadequate range capabilities.

Additionally, Army Environmental Command; Army Training and Doctrine Command; Directorate of Planning, Training, Mobilization and Security (DPTMS); and Directorate of Public Works personnel met on 9 October 2019 to define functionality of a MPTR range and required impact area requirements. Fort Bragg DPTMS personnel defined a duded impact area as a high hazard area where authorized entry can only be approved by the Fort Bragg Installation Range Officer. Authorization into a duded impact area requires a specific request, rationale for entry, and an explosive ordnance disposal (EOD) escort. A non-duded impact area still requires entry approval by Range Operations; however, small arms, non-exploding munitions are only used. The proposed supporting impact area requirements would be a non-duded impact area.

2. Description of Alternatives. Five potentially suitable alternatives were identified for the proposed actions and evaluated against screening criteria. The alternatives are as follows:

2.1 Alternative 1: No Action Alternative: The No Action Alternative would not construct and operate a MPTR, and not equip the IBCTs with the MPF. This alternative does not meet the purpose and need; however, the Council of Environmental Quality and Army NEPA regulations require consideration and analysis of the No Action Alternative to provide a baseline against which the other alternatives may be compared.

2.2 Alternative 2: Construct and operate a range south of McPherson Impact Area with MPF gunnery capability. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range surface danger zone (SDZ) would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Construction would start north of Plank Road at Firebreak 7 expanding north in order to avoid demolition of Sandy Grove Church and the associated cemetery. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of unexploded ordnance (UXO) support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). The proposed alternative would directly adversely affect 11 federally endangered red-cockaded woodpecker (RCW) clusters. Tree removal would occur within federally endangered *Schwalbea americana* plant site SCAM023A, however, would not require removal or disturbance of this species. Additionally, two species at risk (SAR) occur within the proposed project footprint and will be impacted by range construction and operation. Pyxie moss (*Pyxidantha brevifolia*) coincides with the proposed project footprint (site PYBR074A) and one population of Heller's cudweed (*Pseudognaphalium helleri*; PSHE029A). Additionally, range construction would fill 0.3 acres of an isolated wetland and convert 8.8 acres of a forested wetland to a non-forested wetland.

2.3 Alternative 3: Construct and operate a range south of McPherson Impact Area without MPF gunnery capability. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range SDZ would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Construction would start north of Plank Road at Firebreak 7 expanding north. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed alternative would directly adversely affect 11

RCW clusters. Tree removal would occur within federally endangered *Schwalbea americana* plant site SCAM023A, however, would not require removal or disturbance of this species. Additionally, two SAR occur within the proposed project footprint, and will be impacted by range construction and operation. Pyxie moss (*Pyxidantha brevifolia*) coincides with the proposed project footprint (site PYBR074A) and one population of Heller's cudweed (*Pseudognaphalium helleri*; site PSHE029A). Additionally, range construction would fill 0.3 acres of an isolated wetland and convert 8.8 acres of a forested wetland to a non-forested wetland.

2.4 Alternative 4: Construct and operate a range southwest of McPherson Impact Area with MPF capability (starting at Plank Road). The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). The proposed project would intersect a major tributary of Rockfish Creek; the construction and full range operation would impact a portion of these designated wetlands (approximately 98.79 acres of wetlands and 20,733 linear feet of stream). Alternative 4 construction and operation would impact four archeological sites (31HK1562, 31HK1567, 31HK1584, and 31HK3676) and one potential archeological site (31HK617). The proposed MPTR construction and operation would potentially adversely impact nine RCW clusters, four pyxie moss SAR *Pyxidantha brevifolia* sites (PYBR017F, PYBR026F, PYBR026G, PYBR026H), one bog spicebush SAR (*Lindera subcoriacea*) site (LISU016A), one pine barren boneset SAR (*Eupatorium resinosum*) site (EURE048A), and one Chapman's yellow-eyed grass SAR (*Xyris chapmanii*) site (XYCH013A)

2.5 Alternative 5: Construct and operate a range southwest of McPherson Impact Area without MPF capability (starting at Plank Road). The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed project would intersect a major tributary of Rockfish Creek; the project would remove vegetation, construct within, and fully operate within designated wetlands (approximately 98.79 acres of wetlands and 20,733 linear feet of stream). Alternative 5 construction and operation would impact four archeological sites (31HK1562, 31HK1567, 31HK1584, and 31HK3676) and one potential archeological site (31HK617). The proposed MPTR construction and operation

would potentially adversely impact nine RCW clusters, four pyxie moss SAR *Pyxidantha brevifolia* sites (PYBR017F, PYBR026F, PYBR026G, PYBR026H), one bog spicebush SAR (*Lindera subcoriacea*) site (LISU016A), one pine barren boneset SAR (*Eupatorium resinosum*) site (EURE048A), and one Chapman's yellow-eyed grass SAR (*Xyris chapmanii*) site (XYCH013A).

Based on the alternatives screening process, Alternatives 1 and 2 were carried forward for analysis.

3. Anticipated Environmental Impacts. The EA analyses found only non-significant impacts on soil erosion/water resources, threatened and endangered species, wetlands, and cumulative effects for the two alternatives.

4. Preferred Alternative. Of the alternatives considered, the preferred alternative is Alternative 2 – *Construct and Operate a Range South of McPherson Impact Area North of Firebreak 7 with MPF Gunnery Capability*.

TABLE OF CONTENTS

1. WHAT IS THE PROPOSED ACTION?	10
1.1 WHAT IS THE PURPOSE AND NEED FOR THE PROPOSED ACTION?	12
1.2 WHAT IS THE DECISION TO BE MADE?	13
1.3 WHAT IS THE SCOPING AND PUBLIC INVOLVEMENT PROCESS?	13
2. DESCRIPTION OF THE ALTERNATIVES	14
2.1 WHAT IS THE ALTERNATIVES SCREENING PROCESS?	16
2.2 WHAT IS THE PREFERRED ALTERNATIVE?	18
3. ASSOCIATED MPF-FIELDING PROJECTS ASSESSED FOR CUMULATIVE ENVIRONMENTAL IMPACTS	18
4. ANTICIPATED ENVIRONMENTAL IMPACTS	20
4.1 ENVIRONMENTAL RESOURCES NOT IMPACTED	20
4.2 IMPACTED ENVIRONMENTAL RESOURCES	26
5. IMPACT SUMMARY	35
6. PREPARATION AND CONSULTATION	35
7.0 DISTRIBUTION LIST	41

LIST OF INCLUSIONS

Inclusion A: Proposed MPF Equipment Allocation and Schematic

Inclusion B: Draft Stationing Summary and Equipment

Inclusion C: Preferred Alternative

Inclusion D: Preferred Alternative SDZ

Inclusion E: MPTR Preferred Alternative and Alternative 3 Location with Non-Dudded Impact Boundary

Inclusion F: Location of Alternatives 4-5

Inclusion G: Location of Alternatives 4-5 with Environmental Overlay

Inclusion H: Anticipated TEMF Construction

Inclusion I: Maneuver Trail Concept

Inclusion J: FA-26002-20

Inclusion K: Road Upgrade Map

Inclusion L: IPBC

Inclusion M: ARF+

Inclusion N: Scout Location

Inclusion O: Resource Area Issues, Concerns, Risks

Inclusion P: Location of Preferred Alternative with Environmental Layers

Inclusion Q: Noise Map

Inclusion R: Environmental Justice

Inclusion S: Soil Survey

Inclusion T: Topographic Map

Inclusion U: BA

Inclusion V: BO

Inclusion W: TEMF ENV Overlay

Inclusion X: FEMA Map

Inclusion Y: Wetland Map

Inclusion Z: TEMF FEMA Map

Inclusion AA: Finding of No Practicable Alternative

Inclusion BB: IPBC FEMA Map

Inclusion CC: ARF+ FEMA Map

Inclusion DD: Scout FEMA Map

1.0 WHAT IS THE PROPOSED ACTION?

The proposed action is for the construction and operation of a multipurpose training range (MPTR; Project Number (PN) 96182) at Fort Bragg, North Carolina. Fort Bragg is deficient of mounted gunnery ranges according to the 8-9 October 2019 planning charrette lead by the Department of the Army (DA) Combined Arms Center. Fort Bragg requires a mounted gunnery range allowing long-distance firing for training and qualification. The proposed automated range would support mounted vehicles to include the new mobile protected firepower (MPF) vehicle. The MPF is capable of firing rounds following gunnery standards for the mobile gun system (MGS or M1). The proposed range facility would be constructed in Fiscal Year (FY) 2023. Fort Bragg would receive MPFs in FY2025 and 2026. No existing Fort Bragg range can support MPF firing and training requirements.

Multipurpose Training Range Requirement

The proposed MPTR is specifically designed to satisfy the training and qualification requirements for the crews, teams, and sections of combat units. This range would support dismounted infantry squad tactical live-fire operations, either independently of, or simultaneously with supporting vehicles. The range would be utilized to train and test armor, infantry, and aviation teams, crews, and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets would be fully automated, and the event specific target scenario would be computerized and operated from an on-site control tower. Captured audio/video would be compiled and available to the unit at the after-action review (AAR).

Range construction would begin in FY2023. Primary facilities include a 578 square foot (sf) control tower, one 1,800 sf operations facility, port-a-john pads with three-sided wind walls, a 726-sf bleacher enclosure, 800 sf covered mess, 1,064 sf instrumented range AAR building, 450 sf ammunition loading dock, six bivouac pads (15 - by 25-feet each), and unit storage. The range would consist of six moving ammunition targets, 30 stationary targets and berms, four moving infantry targets, 122 stationary infantry targets, ten battle positions, five urban facades, one urban cluster consisting of seven buildings, one helicopter tactical landing area, four camera towers and two machine gun bunkers. The project would require utilities to include: storm drainage; fencing; paving; electricity; and communications. Potable water will be trucked on site and a portable toilet contract will provide wastewater services. Additional construction would include: a 17,000 linear foot (lf) by 20 foot (ft.)-wide tank trail; 35,000 lf by eight ft.-wide maintenance trail; site clearing and grading; fencing; and gravel parking area. Range road construction will be 20 ft. wide and road construction within the administrative facility section used for control and administrative reasons (range operations control area) will be 24 ft. wide. The entire range will be cleared of

vegetation (816 acres) and approximately 20% of the range will be grubbed (160 acres).

Additionally, Army Environmental Command; Army Training and Doctrine Command; Directorate of Planning, Training, Mobilization and Security (DPTMS); and Directorate of Public Works (DPW) personnel met on 9 October 2019 to define functionality of a MPTR range and required impact area requirements. Fort Bragg DPTMS personnel defined a duded impact area as a high hazard area where authorized entry can only be approved by the Fort Bragg Installation Range Officer. Authorization into a duded impact area requires a specific request, rationale for entry, and an explosive ordnance disposal (EOD) escort. A non-duded impact area still requires entry approval by Range Operations; however, small arms, non-exploding munitions are only used. The proposed project is not designed to allow firing of duded munitions such as high explosive ammunition, however, for inert or ball ammunitions. Therefore, the supporting project impact area would be non-duded (Amacker, 2020).

Mobile Protected Firepower Requirement

The Army Strategic Planning Guidance 2013 states that the Army will modernize equipment to plan for future challenges; the Army would develop and field a mix of necessary equipment to ensure Soldiers have adequate equipment to support missions in a timely manner.

The MPF is a new materiel solution to enemy direct and indirect fire providing the vehicle crew with 360-degree situational awareness in all operational environments, day or night, while in the closed-hatch configuration; the main weapon system will be a large caliber cannon (DA Maneuver Center of Excellence, 2017). See Inclusion A for the MPF proposed equipment allocation and schematic. According to the DA Futures Command 2017 draft *Capability Development Document for Mobile Protected Firepower* report, the MPF and furnished accessories will be designed to eliminate or minimize environmental impacts in support of the National Environmental Policy Act (NEPA) and executive order (EO) 12114, EO 13423, EO 13514 and other applicable EOs. The MPF vehicles will weigh 42 tons or less, and require new materiel support systems including: transportation systems; fuelers; weapons systems; command, control, and communications, computers and intelligence networks; long-range advanced scout surveillance systems; electronic warfare systems; and standards in Training Commission allocation. Other items associated with the MPF include a heavy vehicle recovery asset; one fuel heavy, expanded; mobility tactical truck; and two maintenance contact vehicles (DA Futures Command, 2017).

The MPF operational terrain accommodates improved surfaces and unimproved surfaces. Improved surfaces are primary and secondary roadways with some type of all-weather surfaces, man-made improvements, and subject

to periodic maintenance. Improved surfaces range from paved, high-speed roads in excellent condition through rutted and potholed gravel roads. Unimproved surfaces are trails and cross-country unimproved, vegetated surfaces. Unimproved terrains include, but are not limited to, deserts, grasslands, sand, swamps, forests, tropical jungles, mountains, shallow rivers, and salt-water beaches. The MPF operational envelope requires the capability for extended, effective operation on all-terrain surfaces, but particularly on unimproved surfaces during all-weather conditions either day or night with limited and poor visibility. The MPF is designed to be deployed worldwide and operate in all environmental conditions and provide Infantry Brigade Combat Teams (IBCTs) with a precision, all-weather, shoot-on-the-move capability. The MPF supports the Joint Force Commander by providing a highly mobile and lethal platform to accomplish operational support missions in a variety of roles (DA Futures Command, 2014).

The 82nd Airborne Division would receive a MPF battalion and the MPF companies would maintain a tactical alignment with the IBCTs. The IBCTs currently utilize indirect fire or air support in urban terrain or restrictive combat scenarios. To be expeditionary, an IBCT must have strategic deployment capability to engage quickly, and sufficient firepower to deliver direct fire permitting dismounted forces to penetrate enemy defensive positions. The MPF would enable the IBCT to apply instantaneous, long-range direct fire to overcome enemy prepared positions, bunkers and armor threats. The MPF will enable IBCT commanders to control synchronized and integrated assaults transitioning rapidly to the next engagement. The MPF also provides IBCT commanders mobility in complex terrain with mobile protected firepower in an offensive role. Fort Bragg would receive 14 MPF vehicles in FY2025, and 28 in FY2026. Fort Bragg DPW intends to repair existing barracks Building 399 to house new MPF-related personnel (project FA-90531-21), and would conduct environmental analysis summarized in a subsequent NEPA document once renovation plans have been developed. See Inclusion B for the draft stationing summary and a list of equipment and allocation.

A Soldier Vehicle Assessment (SVA) and Limited User Test (LUT) of MPF prototypes were conducted on Fort Bragg in FY2020 and FY2021. Fort Bragg environmental SVA and LUT analysis concluded with a record of environmental consideration signed 3 July 2019. Live-fire activities associated with the LUT transpired at Fort Stewart, Georgia, due to Fort Bragg inadequate range capabilities.

1.0.1 WHAT IS THE PURPOSE AND NEED FOR THE PROPOSED ACTION?

Fort Bragg is deficient of mounted gunnery ranges that support training and qualification. Additionally, the new MPF vehicle would enable instantaneous, long-range direct fire to counter enemy threats. The proposed automated range

construction would provide operation of mounted vehicles and firing long distance munitions.

1.0.2 WHAT IS THE DECISION TO BE MADE?

The proponent for the proposed action is the Garrison Commander of the Installation who decides which alternative best meets the purpose and need of the proposed action, including location, mitigation, configuration, and supporting infrastructure.

1.0.3 WHAT IS THE SCOPING AND PUBLIC INVOLVEMENT PROCESS?

The proposed action warrants an environmental assessment (EA) based on 32 Code of Federal Regulations (CFR) Part 651 Appendix B, subparagraph (c)(1) due to new construction exceeding 5.0 cumulative acres of new surface disturbance. This EA was prepared in accordance with the NEPA of 1969 [42 United States Code (USC) 4321 *et seq.*], Council on Environmental Quality (CEQ) Regulations 40 CFR Parts 1500-1508, and Army Regulations (ARs) 32 CFR Part 651 (*Environmental Analysis of Army Actions*; DA 2002). This EA will evaluate the potential impacts of the proposed project, inform decision makers and the public of likely environmental consequences of the proposed actions and alternatives, provide a forum for public feedback, and will include a determination of a finding of no significant impact (FNSI) or a Notice of Intent to prepare an Environmental Impact Statement (EIS) and record of decision (ROD). Pursuant to 32 CFR Part 651, this EA will evaluate the potential environmental impacts of the project and cumulative impacts (CEQ, 1997). These actions are based on the best information and data available as of June 2022. Additionally, EO 11990 requires federal agencies to publish a finding of no practicable alternative (FONPA) and provide an opportunity for early public review of plans or proposals for new construction in wetlands. This EA, draft mitigated FNSI, and draft FONPA will be made available to state and federal agencies (through the North Carolina Department of Administration) and the public for a 30-day review at the following locations:

Cumberland County Public Library, 300 Maiden Lane, Fayetteville, NC 28301.

John L. Throckmorton Library, Building 1-3346, Randolph Street, Fort Bragg, NC 28310.

Harnett County Library, 601 South Main Street, Lillington, NC 27546.

Hoke County Public Library, 334 N. Main Street, Raeford, NC 28376.

Moore County Library, 101 Saunders Street, Carthage, NC 28327.

During the comment period, any public comments received will be collected, logged, and incorporated into draft mitigated FNSI as necessary. Once all comments have been received, a final mitigated FNSI will be prepared.

2.0 WHAT ARE THE ALTERNATIVES CONSIDERED IN THIS EA?

The five alternatives below were identified as potentially suitable for the proposed actions and evaluated against the screening criteria listed in Section 2.1.

2.0.1 Alternative 1: No Action Alternative: The No Action Alternative would not construct and operate a MPTR range, and not equip the IBCTs with the MPF. This alternative does not meet the purpose and need; however, the CEQ and Army NEPA regulations require consideration and analysis of the No Action Alternative to provide a baseline against which the other alternatives may be compared.

2.0.2 Alternative 2: Construct and operate a range south of McPherson Impact Area with MPF gunnery capability and the facilities described in Section 1.0 to include: connecting to electrical and communication utilities approximately 13,000 lf from the site; and 13,000 lf of fiber optic cable lines from an existing communication node along Plank and Raeford Vass Roads to the proposed project area. The lines would be bored under the wetland feature spanning Plank Road. See Inclusion C. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range surface danger zone (SDZ) would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. See Inclusion D. Construction of the MPTR would start north of Plank Road at Firebreak 7 expanding north to avoid demolition of Sandy Grove Church and the associated cemetery located at Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of unexploded ordnance (UXO) support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). The proposed alternative would directly adversely affect 11 federally endangered red-cockaded woodpecker (RCW) clusters. Tree removal would occur within federally endangered *Schwalbea americana* plant site SCAM023A, however, would not require removal or disturbance of this species. Additionally, two species at risk (SAR) occur within the proposed project footprint and will be impacted by range construction and operation. Pyxie moss (*Pyxidantha brevifolia*) coincides with the proposed project footprint (site PYBR074A) and one population of Heller's cudweed (*Pseudognaphalium helleri*; PSHE029A). Additionally, range construction would fill 0.3 acres of an isolated wetland and convert 8.8 acres of a forested wetland to a non-forested wetland. See Inclusion E.

2.0.3 Alternative 3: Construct and operate a range south of McPherson Impact Area without MPF gunnery capability. Facilities described in Section 1.0 would be

constructed as well as: connecting to electrical and communication utilities approximately 13,000 lf from the site; and 13,000 lf of fiber optic cable lines from an existing communication node along Plank and Raeford Vass Road to the proposed project area. The lines would be bored under the wetland feature spanning Plank Road. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range SDZ would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Range construction would start north of Plank Road at Firebreak 7 expanding north. The newly expanded portion of McPherson Impact Area would be non-dudged. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed alternative would directly adversely affect 11 RCW clusters. Tree removal would occur within federally endangered *Schwalbea americana* plant site SCAM023A, however, would not require removal or disturbance of this species. Additionally, two SAR occur within the proposed project footprint, and will be impacted by range construction and operation. Pyxie moss (*Pyxidantha brevifolia*) coincides with the proposed project footprint (site PYBR074A) and one population of Heller's cudweed (*Pseudognaphalium helleri*; site PSHE029A). Additionally, range construction would fill 0.3 acres of an isolated wetland and convert 8.8 acres of a forested wetland to a non-forested wetland. See Inclusion E.

2.0.4 Alternative 4: Construct and operate a range southwest of McPherson Impact Area with MPF capability (starting at Plank Road) and the facilities described in Section 1.0 to include: connecting to electrical utilities and direct-burying fiber optic cable lines from an existing communication node along Plank Road to the proposed project area. The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudged. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). See Inclusion F. The proposed project would intersect a major tributary of Rockfish Creek; the project would remove vegetation, construct within, and fully operate within designated wetlands (approximately 98.79 acres of wetlands and 20,733 linear feet of stream). Alternative 4 construction and operation would impact four archeological sites (31HK1562, 31HK1567, 31HK1584, and 31HK3676) and one potential archeological site (31HK617). The proposed MPTR construction and operation would potentially adversely impact nine RCW clusters, pyxie moss SAR (*Pyxidantha brevifolia*) sites (PYBR017F, PYBR026F, PYBR026G, PYBR026H), one bog spicebush SAR (*Lindera subcoriacea*) site (LISU016A), one pine barren boneset SAR (*Eupatorium resinsum*) site (EURE048A), and

one Chapman's yellow-eyed grass SAR (*Xyris chapmanii*) site (XYCH013A). See Inclusion G.

2.0.5 Alternative 5: Construct and operate a range southwest of McPherson Impact Area without MPF capability (starting at Plank Road). Facilities would be constructed as described in Section 1.0 as well as: connecting to electrical utilities and direct burying of fiber optic cable lines from an existing communication node along Plank Road to the proposed project area. The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudged. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). See Inclusion F. Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed project would intersect a major tributary of Rockfish Creek; the project would remove vegetation, construct within, and fully operate the range within designated wetlands (approximately 98.79 acres of wetlands and 20,733 linear feet of stream). Alternative 5 construction and operation would impact four archeological sites (31HK1562, 31HK1567, 31HK1584, and 31HK3676) and one potential archeological site (31HK617). The proposed MPTR construction and operation would potentially adversely impact nine RCW clusters, four pyxie moss SAR *Pyxidantha brevifolia* sites (PYBR017F, PYBR026F, PYBR026G, PYBR026H), one bog spicebush SAR *Lindera subcoriacea* site (LISU016A), one pine barren boneset SAR *Eupatorium resinosum* site (EURE048A), and one Chapman's yellow-eyed grass SAR *Xyris chapmanii* site (XYCH013A). See Inclusion G.

2.1 WHAT IS THE ALTERNATIVES SCREENING PROCESS?

The screening criteria listed below are used to assess the reasonable alternative(s) to be considered in this EA:

2.1.1 In 2010, Fort Bragg (in conjunction with Parsons) completed the *Programmatic Environmental Assessment for the Implementation of the Real Property Master Plan*. This EA evaluated the 2008 Long-Range Component (LRC) of the Real Property Master Plan and the use of the master planning process at Fort Bragg (DA). The 2008 LRC includes a future land-use plan and a long-range development plan. The future land-use plan recommends changes to the Installation's land-use patterns to better support and sustain the evolving missions of Fort Bragg and all assigned tenant units.

Alternatives considered in this EA may not conflict with existing mission assignments and training activities or future mission assignments and training activities that are programmed and funded. Alternatives that disrupt, displace, or

eliminate necessary mission activities or future mission activities will be eliminated from full consideration. Similar use facilities and functional areas should be collocated as described in the 2008 EA to maximize mission capabilities.

2.1.2 Support mission requirements. Alternatives considered must support and provide for the mission requirements of Soldiers at the Installation.

2.1.3 Maintain regulatory compliance. Alternatives considered must allow for compliance with all state and federal regulations.

2.1.4 Maintain safety of Soldiers and Civilians. Alternatives considered must not pose any danger to any Soldiers or Civilians on the Installation.

2.1.5 Avoid significant impacts to environmentally sensitive resources. Alternatives considered must avoid significant impacts to environmentally sensitive resources on the Installation.

2.1.5.1 Alternatives Eliminated from Full Analysis: Alternatives 3, 4, and 5 will be eliminated from full analysis in this EA based on the alternatives screening process.

Alternatives 2-5 would impact federally endangered species. Alternatives 2-5 approximate similar RCW impacts. Alternatives 2 and 3 additionally impact an American chaffseed site. Alternatives 4 and 5 would impact more SAR sites than Alternatives 2 and 3. None of the Alternatives would result in a significant biological impact defined as: substantial permanent conversion or net loss of habitat at the landscape scale; long-term loss or impairment of a substantial portion of local habitat (species-dependent); and unpermitted “take” of threatened and endangered species (DA, 2021).

Alternatives 4 and 5 would impact archeological sites; Alternatives 2 and 3 would not impact any cultural resources. Similarly, Alternatives 4 and 5 would impact approximately 98.79 acres of wetlands and 20,733 linear feet of stream compared to Alternative 2 which would impact 9.1 acres of wetlands. Alternatives 4 and 5 were eliminated from consideration due to augmented wetland and cultural resource impacts compared to Alternatives 2 and 3.

Alternative 3 and 5 do not meet the requirements under Screening Criteria 2.1.1 and 2.1.2. Constructing a MPTR range without the MPF would not satisfy current IBCT capability requirements. This alternative was therefore eliminated from consideration.

Alternatives 4 and 5 do not meet the requirements under Screening Criteria 2.1.1 and 2.1.2. Constructing a MPTR range at the southwest corner of the installation

would conflict with unmanned aerial systems launched and recovered from Nijmegen Drop Zone.

2.1.5.2 Alternatives Carried Forward for Full Analysis: Alternatives 1-2 will be carried forward for full analysis in this EA.

2.2 WHAT IS THE PREFERRED ALTERNATIVE?

Of the alternatives considered, the preferred alternative is Alternative 2 – *Construct and Operate a Range South of McPherson Impact Area North of Firebreak 7 with MPF Gunnery Capability*. This is the only alternative that will fully satisfy the purpose and need for the mission. Alternative 2 was additionally re-configured during the 35% design review as specified in this EA to minimize and avoid RCW and rare plants.

3.0 ASSOCIATED MPF-FIELDING AND PROJECTS ASSESSED FOR CUMULATIVE ENVIRONMENTAL IMPACTS

Several future projects are required to support the MPF vehicle stationing and operation at Fort Bragg. The project locations, specification and execution dates are conceptual and therefore not fully assessed in this EA. Environmental impacts will be considered in the cumulative impacts section for the following projects. Subsequent regulatory consultations and NEPA documentation will be completed for these projects.

3.1 Tactical Equipment Maintenance Facilities (TEMF). Each IBCT would require a TEMF to store and maintain vehicles including the MPF. Three TEMFs would be constructed; PN 12289 will be constructed in FY2031 while construction of PN-93098 and an unspecified PN are yet to be determined. The proposed projects would construct a standard organizational tactical equipment shop with a seven and a-half ton bridge crane, deployment storage, fuel dispensing and storage, and hardstand to support the in-bound MPF mission. Project 12289 will additionally construct an organizational storage facility and a privately owned vehicle parking lot. All three TEMF projects will have electrically operated rollup doors, vehicle exhaust ventilation, and compressed air. Each TEMF will include tying into existing infrastructure, site improvement and drainage, hardstand, fencing and a satellite accumulation area to temporarily place hazardous materials and petroleum, oil, lubricants (POL) per unified facilities criteria 4-214-02 Section 3-10.5. Hazardous material and POL will be stored according to all state and federal requirements; hazardous waste and POL will not be transported, distributed, used, stored, treated or disposed of as defined by the Resource Conservation Recovery Act. The total construction footprint of all three TEMFs approximates 17 acres with two of the TEMF facilities situated between two wetland fingers of McPherson Creek (HDR, 2020). See Inclusion H.

Anticipated impacts include: soil erosion/water resources management; threatened and endangered species; and wetlands and floodplain management.

3.2 MPF Tank and Maneuver Trails. The October 2021 *Mobile Protected Firepower Life Cycle Programmatic Environmental Assessment* evaluated and concluded that most installations where tracked vehicles had previously operated contained some existing infrastructure to support the MPF (DA). The M551 Sheridan Armored Reconnaissance/Airborne Assault Vehicles were organic to the 82nd Airborne Division and utilized on Fort Bragg from approximately the mid-70s to the mid-90s. The M1 Abrams main battle tanks, M2 Bradley fighting vehicles and M109 Paladin self-propelled howitzers and their support vehicles are currently utilized on Fort Bragg (Amacker, 2020). On 20 May 2021 DPW Engineering, Environmental, and Roads personnel met with DPTMS personnel to discuss MPF infrastructure capability. According to DPW Road and DPTMS personnel, the MPF will utilize existing infrastructure. Current roadway conditions can support MPF operations, however, will require repair to support sustained use.

The existing tank trail was rehabilitated within the existing footprint in 2020 to accommodate the SVA portion of the MPF; the repaired trails will continue to support MPF movement from the main cantonment area to the proposed MPTR. A record of environmental consideration was completed 28 July 2020 for the repair of the tank trail system (Projects FB-26001-20/PN 98849). See Inclusion I for the maneuver trail concept. Project FA-26002-20 (see Inclusion J for map of FA-26002-20) will repair Long Street and Inverness Road; FB-26002-21, FA-26002-21, FA-22123-21, and FA-22124-21 will rehabilitate the existing tank trail; and projects FB-26003-21 and FN-00117-21 will rehabilitate the existing maneuver trails. Projects FA-22008-20, FA-22010-20, FA-22085-20, FA-22120-21, FA-22122-21, and FA-22130-22 will replace bridges BRD28A, BRD38, BRD65A, BRDGV, BRDGP, and BRDG9 respectively. The Fort Bragg DPW will additionally submit future projects to repair Firebreaks 7 and 8, a connector trail from Raeford Vass Road and Long Street, and Bridge 112 (see Inclusion K for the road upgrade map). The Fort Bragg DPW will conduct environmental review and prepare subsequent NEPA documentation of the aforementioned projects.

3.3 Infantry Platoon Battle Course. The proposed action would construct and operate an infantry platoon battle course range (IPBC; PN 86262) with MPF capability. The proposed range complex would satisfy training and qualification requirements of dismounted or mounted infantry platoons. The range would provide platoons necessary skills to conduct tactical movement techniques; additionally, the range would provide platoon training to detect, identify engage, and defeat stationary and moving armor and infantry targets in a tactical array. The proposed range would have four firing points/four objective areas: intermediate, final, counterattack-1, and counterattack-2 objectives. Primary facilities include a six stationary armor targets, one moving armor target, 43

stationary infantry targets, 14 moving infantry targets, one trench obstacle, nine machine gun bunkers with sound effect simulators, two landing zones, and one assault/defend house. All targets would be fully automated; the range would support use of .50 caliber weaponry. The event-specific target scenarios are computer-driven and scored from the range operations center which provides immediate performance feedback to the range participants. Construction would begin in FY2024. See IPBC location at Inclusion L. The general range footprint approximates 95 acres which does not include the SDZ. The IPBC is not being constructed solely for MPF utilization. Anticipated impacts include: soil erosion/ water resources management; threatened and endangered species; and wetlands and floodplain management.

3.4 Automated Record Fire Plus Range. The proposed action would construct a 600 meter, 16-lane automate record fire plus (ARF+; PN 99836) range to accomplish day/night qualification requirements with rifles and carbines, and specifically the Next Generation Squad Weapon. The range will include a range operations area, control tower, classroom building, operations/storage building, bleacher enclosure, covered mess and ammunition breakdown building. Supporting facilities include electric service, site improvements and information systems. The general range footprint approximates 50 acres which does not include the SDZ. The FY2024 ARF+ construction is not specifically for operation of the MPF. Anticipated impacts include: soil erosion/ water resources management; and threatened and endangered species. See ARF+ location at Inclusion M.

3.5 Scout/Recce Gunnery Complex (PN 92159). The standard Scout range includes two course roads that extend approximately 1500 meters downrange. Individual target and target arrays extend to 2000 meters. The range is approximately 650 meters wide. The FY2026 range includes an overlay of the four center lanes of a Multipurpose Machinegun Range to support the scout unit vehicle mounted and dismounted machinegun and sniper training. See Scout Range location at Inclusion N. The general range footprint approximates 250 acres which does not include the SDZ. The Scout Range will not be constructed expressly for operation of the MPF.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS

4.1 ENVIRONMENTAL RESOURCES NOT IMPACTED

This section describes the potential effects of each alternative to baseline environmental resource conditions on the Installation. An analysis of the potential direct and indirect effects associated with each of the alternatives immediately follows the description of each environmental resource. The analysis also includes cumulative effects potentially resulting from the incremental impact of an action when added to other past, present, and reasonably foreseeable future

actions. Impact classification occurs by identification according to the impact severity (i.e., no impact, non-significant impact, significant impact). Impacts are further identified as short-term or long-term. Both the affected environment and environmental consequences are described for comparison within broad resource areas. The following resources considered based on the 2007 Army NEPA Analysis Guidance Manual are:

- Air Quality and Climate Change
- Airspace
- Cultural Resources
- Energy (Utilities)/ Facilities
- Hazardous and Toxic Substances and Waste
- Land Use
- Noise
- Soil Erosion/ Water Resources Management
- Solid Waste
- Socioeconomics, Environmental Justice, and Protection of Children
- Threatened and Endangered Species and Other Biological Resources
- Traffic and Transportation
- Wetlands and Floodplains

See Inclusion O for the list of resources and associated impacts. The following resource areas are not discussed in detail in this EA:

4.1.1 Air Quality and Climate Change: Emissions associated with mobile sources during construction and tree removal will be short-term and temporary. The United States Environmental Protection Agency (EPA) presently designates this region as an attainment area for all criteria pollutants. As a result, an applicability analysis and formal conformity demonstration under the general conformity rule are not required for the proposed action.

The MPF qualifies for a national security exemption from EPA emissions standards because it has armor and permanently attached weaponry. Concentrations of emitted pollutants are expected to exceed EPA emission standards. The primary sources of emissions include dust generation, engine emissions, munitions ignition, and possible release of refrigerants and fire suppressants. Vehicle maneuvers may generate airborne dust which is expected to be a short-term impact of vehicle operation. The MPF is expected to generate some level of criteria pollutants and greenhouse gas. The MPF will be fueled with high-sulfur diesel such as JP-8 (MIL-DTL- 83133E), NATO F-24 (NE-14-28), and DF-2 (ASTM D 975). Diesel engine exhaust emissions will include CO, CO₂, various hydrocarbons (HCs), particulate matter and NO_x – the concentrations of which will vary according to the sulfur content of fuels used. Live-fire events are expected to emit a negligible quantity of pollutants. Testing, training, and operation will require firing of the of the main turret cannon, supporting small

arms, the smoke grenade launcher and the on-board smoke generator. Air-borne emissions related to propellant ignition include carbon monoxide (CO), ammonia (NH₃), hydrogen chloride (HCl), nitrogen oxides (NO_x), sulfur oxides (SO_x) and lead oxides (PbO_x). Hazardous air pollutants (HAP) generated by smoke grenades will include CO, CO₂, lead (Pb), (NO_x), sulfur dioxide (SO₂), particulate matter (PMT-2.5 microns and PMt-10 microns) and various hydrocarbons among trace amounts of several HAP pyrotechnic products which are anticipated to quickly disperse (DA, 2021).

Construction activities may also generate air emissions. Range construction and MPTR operational related generators will be owned and operated by Fort Bragg's energy partner, Sandhill's Utility Services, Inc. (SUS); SUS will assume all the air quality regulatory compliance standards for these generators.

The DPW Forestry Branch will harvest merchantable timber and remaining vegetation will be removed off-site; burning of land clearing debris will not occur.

The EO 13990 (Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis) outlines policies intended to ensure federal agencies capture greenhouse gas (GHG) emissions while factoring in compounded global emissions. The GHGs are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and climate change. Most of the GHGs occur naturally in the atmosphere, but concentrations increase from human activities such as burning fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide (CO₂), methane, NO_x, and other greenhouse (or heat-trapping) gases to the atmosphere. Whether rainfall will increase or decrease remains difficult to project for specific regions (IPCC, 2007). Forested areas act as a sink (absorbing CO₂ from the atmosphere) or a source (fire, conversions, and timber harvesting) of GHG emissions. In the United States, managed forests absorb more CO₂ from the atmosphere than is emitted. Approximately one-half to two thirds of CO₂ from the forest product is emitted at the time of harvest depending on species and region within the United States (USEPA, 2021). Land management activities can both contribute to and reduce GHG emissions (CEQ, 2016). The proposed project will remove 816 acres of forested land. The proposed action will have negligible impacts on regional or local air quality. The proposed action will additionally have negligible impacts to global climate change. The *Mobile Protected Firepower (MPF) Life Cycle Environmental Assessment (EA)* detailed that the MPF will minimally impact air quality and global warming. Each MPF vehicle is estimated to accrue approximately 3,500 miles annually (DA, 2021). Therefore, use of existing military vehicles on the MPTR in addition to the MPF would result in negligible social cost of greenhouse gasses.

4.1.2 Airspace: The Federal Aviation Administration (FAA) manages all airspace within the US and its territories. The FAA recognizes the military needs to conduct various flight operations and training within airspace other than commercial and general aviation. Most military operations are conducted within designated airspace and follow specific procedures to maximize flight safety. Neither alternative requires altering airspace designation, expansion, or usage. Therefore, airspace is eliminated from further analysis.

4.1.3 Cultural Resources: The range construction and operation will not impact cultural resources.

Two separate surveys for cultural resources were conducted on parcels including the MPTR footprint. The first survey report was submitted by Fort Bragg to the State Historic Cultural Resources Office (SHPO) on 15 December 2005 and the second was submitted 19 March 2008. Fort Bragg determined that the area does not contain potentially eligible for listing on the National Register of Historic Places. The SHPO concurred respectively on 3 July 2006 and 15 October 2007. Additionally, these findings were briefed to the Alabama-Quassarte Tribe, Absentee-Shawnee Tribe Catawba Indian Nation, Muscogee Creek Nation Shawnee Nation Thlopthlocco Tribal Town, Tuscarora Nation, and United Keetowah Band of Cherokee at the time.

Sandy Grove Church and cemetery are located immediately south of the range footprint and will be avoided. The parametric design intersected Alternative 2 with National Register of Historic Places (NRHP) potentially eligible archaeological site 31HK2050 (United States Corps of Engineers Savannah District, 2020). Site 31HK2050 is a 19-20th century African American homestead. The Fort Bragg Cultural Resources subject matter expert, and engineering and architecture team shifted the range boundary to the west which excluded Site 31HK2050 from the proposed project footprint.

Archeological site 31HK2024 spans a section of Firebreak 8 which would be used by the MPF to access the MPTR. The DPW Cultural Resource subject matter expert met with DPTMS personnel; and DPW Engineering, Roads, and other DPW environmental personnel to discuss road improvements 20 May 2021. The cultural resources subject matter expert determined the road repair to include capping would not impact the archeological site, but conversely protect the resource from erosion and vehicle usage.

Additionally, Site 31HK1074 occurs east of Raeford Vass Road. See Inclusion P. A Phase I site investigation found light deposits of military items and possible historic period artifacts associated with a historic settlement, and Early Archaic and Middle to Late Woodland artifacts. A follow-on Phase II investigation corroborated presence of military related items and did not support historic component evidence. The site had been impacted heavily from military use. The

Phase II report recommends Site 31HK1074 ineligible for NRHP-listing (SCIAA-ARD, 2019); as a result, the proposed project will not impact cultural resources.

4.1.4 Communication and electrical lines will be installed in the existing road and power line right of ways of Plank and Raeford Vass Roads. Therefore, communication and electrical line impacts are eliminated from further analysis.

4.1.5 Energy (Utilities)/Facilities: The primary sources of energy utilized at Army installations include electricity, natural gas, fuel oil, and propane. Neither alternative result in utilizing a novel energy mode. Neither alternative requires demolition of facilities or any supporting utilities. Alternative 2 requires constructing supporting electrical and communication lines; however, these utilities would tie into existing utility lines. Existing utilities could support the electrical and communication load required to operate Alternative 2. Therefore, facilities and energy/utilities are eliminated from further analysis.

4.1.6 Hazardous Waste and Materials: No existing structures occur on site; therefore, the proposed actions will not impact asbestos-containing materials or lead-based paint. Operational vehicles will require routine refueling. In addition, vehicle fluids, although changed out during maintenance activities, may periodically need to be topped-off. Grease or other lubricants may be applied on as needed. Technical manuals will outline procedures to minimize the likelihood of a spill during refueling and topping off fluids. Personnel will follow spill prevention plans and standard operating procedures to prevent, or clean and dispose of material in the event of a spill. Munitions, which contain hazardous components, are required for effective crew training. Soldiers receive training on safe handling of munitions. Spent casings will be disposed in accordance with installation procedures and environmental laws and regulations (DA, 2020). As a result, hazardous waste and hazardous materials will not be impacted or produced by the proposed action.

4.1.7 Land Use: The Fort Bragg Regional Land Use Advisory Commission (RLUAC) organized to protect military training areas from incompatible urban development. The RLUAC sponsored the *Fort Bragg/Pope Air Force Base Joint Land Use Study* (NC Department of Commerce, 2018), to evaluate military training impacts by surrounding land use. The proposed project location is within the designated training area of Fort Bragg, however, outside of any designated existing range or impact area. There are no Installation Restoration Program or Military Munitions Response Program issues associated with the proposed action. The project requires UXO support during construction activities. The proposed project area will continue to be used for training purposes; therefore, will not affect existing land use.

4.1.8 Noise: Vehicle operational noise is expected to range from approximately 90 decibels (dB) at idle to 120dB at full operational velocity. Live

fire exercises will generate impulse noise. The MPF's main cannon is expected to generate Sound Pressure Levels (SPLs) up to 180dB at ignition with an equal SPL at impact downrange. The smaller-caliber coaxial weapons are expected to generate SPLs up to 165dBs. Live fire exercises will be intermittent and may temporarily disrupt wildlife and neighboring communities when occurring. Indirect noise impacts would occur due to construction (DA, 2021). The 2018 Fort Bragg Joint Land Use Study (Inclusion Q) demonstrates the proposed project area intersects an existing noise zone of Fort Bragg consistent with experiencing large arms firing and ordnance blasts. Therefore, the proposed actions will have no effect on the existing noise levels.

4.1.9 Solid Waste: There will be no impacts to solid waste management. The Fort Bragg Lamont Construction and Demolition (C&D) Landfill is closed and will not accept any C&D waste. All contractors will use a State Certified C&D Landfill or Subtitle "D" Landfill off Fort Bragg for C&D and asbestos waste disposal. The contractor is responsible to maintain data of all waste disposed and materials recycled off Fort Bragg. The DA and the North Carolina Department of Environmental Quality (NCDEQ) requires monthly and annual reporting of all materials (waste and recyclables) managed by Fort Bragg. The Fort Bragg Environmental Compliance Branch, Solid Waste/Recycling Office is responsible for compiling data into monthly reports for the DA and the NCDEQ. A provided form from the Solid Waste/Recycling Office or a contractor form will be filled out with the type of waste or recycled material, the weight of the waste/material (tons or pounds), and the facility to which the waste or recyclables were delivered. This information is required to be sent to the Fort Bragg Solid Waste/Recycling Office by the second Friday of each month.

State Law and Fort Bragg regulations requires covering waste or recyclable loads to prevent litter. All waste or recyclable material loads are subject to inspection while present on Fort Bragg. All recyclable materials generated from a construction or demolition job is property of the government unless the contract specifies the contractor can obtain the materials. Items such as heating, ventilation and air conditioning units (Freon removed), air handlers, piping, metals, beams, motors, valves, copper wire, etc. will be transported to the DPW Recycling Center (Butner and Reilly Road) or the Recycling Area at the Lamont Landfill Facility.

4.1.10 Socioeconomics, Environmental Justice, and Protection of Children: EO 12898 (*Federal actions to Address Environmental Justice in Minority Populations and Low-income Populations*) requires federal agencies to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The alternatives will be contained within the Fort Bragg boundary on un-inhabited, forested land; consequently, there will be no direct effect to minority or low-income populations.

In accordance with EO 13045, (*Protection of Children from Environmental Health Risks and Safety Risks*), all federal actions must evaluate whether there would be any impacts on populations of children in the region from the proposed actions. There will be no environmental or socioeconomic impacts that will cross installation boundaries into areas with populations of children, therefore, there would be no impacts on children or low-income populations resulting from alternatives analyzed in this EA (EPA, 2020; see Inclusion R).

4.1.11 Traffic: Fort Bragg has approximately 1,000 miles of woodland access trails referred to as firebreaks. Trails are oriented primarily east to west and spaced approximately 0.2 mile apart. The trail system was established for rapid wildfire management response and effective prescribed burning. These trails serve as maneuver routes for transient military vehicles. Severely eroded firebreaks are repaired with restoration priority afforded to environmentally sensitive sites threatened by erosion and sedimentation and military training safety. Current roadway conditions can support MPF operations, however, will require repair to support sustained use. See Section 3.0.2. The proposed action will have no effect on existing traffic.

4.2 IMPACTED ENVIRONMENTAL RESOURCES. Resources impacted include soil erosion/water resources, threatened and endangered species, and wetlands. See Inclusion P.

4.2.1 Soil Erosion/Water Resources: Soil and sediment erosion results in elevated stream sedimentation rates and turbidity levels. Primary sources include unpaved roads, drop zones, landing zones, flight strips, artillery firing points, borrow pits, clear-cut operations, and stormwater runoff from developed areas. Fort Bragg monitors water quality to identify erosion specifically associated with streams and wetlands for the purpose of restoring eroded areas. Fort Bragg targets to maintain 100-foot riparian buffer zones to protect wetlands and minimize erosion potential. Fort Bragg manages stormwater according to National Pollution Discharge Elimination System Storm Water Permit (NCS000331) provisions.

4.2.1.1 Potential Effects of the Proposed Alternatives

4.2.1.2 Alternative 1: No Action Alternative

Potential Impacts: Under the No Action Alternative, no construction or tree removal will occur. Therefore, this alternative would have no impact on water resources in the area.

Cumulative Impacts: The No Action Alternative would not alter the topography or geology of the soils from the present conditions aside from the natural process

that occurs; therefore, there would be no additional cumulative impacts on water resources.

4.2.1.3 Alternative 2: Construct and Operate a Multipurpose Training Range with MPF Gunnery Capability

Potential Impacts: Construction of the proposed MPTR will require an erosion/stormwater control plan approved by the DPW Water Management Branch. In addition, the proposed construction exceeds one acre and therefore a North Carolina (NC) state erosion control permit will be required. Construction of the range will require a NCDEQ stormwater management permit/plan designed to meet requirements set forth in NC Session Law 2006-246. Plans will be developed per criteria in the NCDEQ Erosion and Sediment Control Planning and Design Manual for erosion control (2013), and Department of Water Quality Best Management Practices Manual for post construction Stormwater Management. State stormwater applications will provide an applicable soils report with the associated Seasonal High-Water Table as well as a map of the boring locations within the footprint of the stormwater control measure. Development and redevelopment exceeding one acre requires water quality treatment for the first inch of rainfall (Session Law 2006-246). Section 438 of the Energy Independence and Security Act (EISA) of 2007 requires development and redevelopment projects exceeding 5,000 square feet to maintain or restore predevelopment hydrology (including temperature, rate, volume, and duration of flow) to the maximum extent technically feasible. The EPA has issued guidance that on-site management of the total volume of rainfall from the 95th percentile storm addresses Section 438 of EISA. The 95th percentile rain event is equal to 1.8 inches of rainfall for this locality. To comply with Section 438 of EISA, a variety of low-impact development methods, such as reducing impervious areas, porous pavements, infiltration basins, vegetated swales, and bio-retention will be incorporated into the development to attain the goal to retain 100 percent of stormwater on-site.

The construction contractor would be responsible for obtaining all necessary stormwater and erosion control project review and permits from the NCDEQ. The NCDEQ mandates that a State Individual Post-Construction Stormwater Permit will be submitted and approved before construction. The overall design objective is to maintain or restore pre-development hydrology and prevent any net increase in stormwater runoff. Adherence to these laws and regulations will result in a non-significant impact to water resources due to additional stormwater runoff. The footprints of all chosen utilities will be included within the limits of disturbance for the entire project.

The United States Department of Agricultural (USDA) Natural Resources Conservation Service Web Soil Survey tool provided a map and approximate percentage of soil-type within the proposed project limits.

(<https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>). The following soils and approximate percentages occur in the project area; see Inclusion S (North Carolina Division of Water Quality, 2005):

- 33.2% Blaney loamy sand, two to eight percent slopes are non-hydric, well drained, deep, and moderately slow permeable soils.
- 4.9% Blaney loamy sand, eight to 15 percent slopes are non-hydric, well drained, deep, and moderately slow permeable soils.
- 21.3% Candor sand, one to eight percent slopes are non-hydric, deep and excessively drained soils.
- 0.2% Candor sand, eight to fifteen percent slopes are somewhat excessively drained soils.
- 4.3% Dothan loamy sand, zero to two percent slopes are well drained soils.
- 21.3% Fuquay sand, zero to four percent slopes are well drained soils.
- 8.4% Gilead loamy sand, two to eight percent slopes are moderately well drained soils.
- 0.3% Johnston loam are poorly drained soils that experience frequent or occasional flooding for brief to long periods.
- 5.9% Vaucluse loamy sand, two to eight percent slopes are moderately slow to slow permeability soils.
- 0.2% Vaucluse loamy sand, eight to fifteen percent slopes are moderately slow to slow permeability soils.

See Inclusion T for a topographic map of the MPTR; USGS, 2020)

The proposed action would not result in significant water resource impacts (exceedance of total maximum daily loads for sediments that causes a change in surface water impairment status, or an unpermitted direct impact to a water of the U.S), or soil impacts defined by the DA (soil loss or compaction from Army training to the extent that natural reestablishment of native vegetation within two growing seasons is precluded on a land area greater than a total of 1,000 acres; or loss of soil productivity due to construction activities, which converts the soil to improved infrastructure on more than five percent of land under administrative control of the installation) (2021).

Cumulative Impacts: Three TEMFs (PN 12289, PN 93098, and PN TBD) will be constructed in support of the MPF which will be utilized at the MPTR. TEMF 12289 is located on an approximate five-acre site with the other two TEMFs located adjacent to the west on an approximate 12-acre site between two wetland fingers of McPherson Creek. Site demolition, preparation, and TEMF construction requires an erosion/stormwater control plan approved by the DPW Water Management Branch and NC erosion control permit. Potential impacts and project procedures are anticipated in keeping with those outlined for implementing the MPTR Preferred Alternative.

The Fort Bragg Water Management Branch is represented in the Fort Bragg Training Lands Working Group (TLWG) to provide stormwater and erosion control feedback and recommendations for proposed projects to include the MPF Tank and Maneuver Trails. The TLWG determined existing infrastructure capable of supporting the MPF would require minimal repair and environmental impacts. As a result, there are no anticipated impacts to soil erosion and water resources. A design iteration has not been issued in support of the IPBC, however, the IPBC will require an erosion/stormwater control plan approved by the DPW Water Management Branch and NC erosion control permit. Potential impacts and project procedures are anticipated in keeping with those outlined for implementing the MPTR Preferred Alternative.

The ARF+ construction will warrant an erosion/stormwater control plan approved by the DPW Water Management Branch and NC erosion control permit. Potential impacts and project procedures are anticipated in keeping with those outlined for implementing the MPTR Preferred Alternative.

A design iteration has not been issued in support of the Scout range; however, construction will warrant an erosion/stormwater control plan approved by the DPW Water Management Branch and a NC erosion control permit. Potential impacts and project procedures are anticipated in keeping with those outlined for implementing the MPTR Preferred Alternative.

Actions under Alternative 2 will comply with the soil conservation measures and the Installation's Stormwater Management Permit (NCS000331) because the Fort Bragg Water Management Branch will review designs prior to any ground disturbance to ensure adherence to permit conditions. Additionally, by following the required permitting processes and following Fort Bragg's strict requirements for erosion control and planning, cumulative impacts to water resources will be non-significant.

4.2.2 Threatened and Endangered Species:

Fort Bragg is home to five federally endangered species. They include: the RCW (*Dryobates borealis*); rough-leaved loosestrife (*Lysimachia asperulifolia*); Michaux's sumac (*Rhus michauxii*); American chaffseed (*Schwalbea americana*); and the Saint Francis' satyr butterfly (*Neonympha mitchellii francisci*; SFS).

4.2.2.1 Potential Effects of the Proposed Alternatives

4.2.2.2 Alternative 1: No Action Alternative

Potential Impacts: Under the No Action Alternative, no construction or tree removal will occur for the purpose of construction and operation of the range, or

operation of the MPF vehicle. Therefore, this alternative would result in no impact to threatened and endangered species.

Cumulative Impacts: The No Action Alternative will result in no significant cumulative impacts on endangered species.

4.2.2.3 Alternative 2: Construct and Operate a Multipurpose Training Range with MPF Gunnery Capability

Potential Impacts: Two floral SAR occur within the proposed project footprint and will be impacted by range construction and operation. Pyxie moss (*Pyxidantha brevifolia*) coincides with the proposed project footprint at site PYBR074A and one population of Heller's cudweed (*Pseudognaphalium helleri*; site PSHE029A; state rare species). Both sites will be impacted due to MPTR construction.

An evaluation conducted 7 October 2020 by Fort Bragg biologists determined the proposed project footprint does not intersect wetlands capable of supporting the SFS, nor are there any known SFS sites occurring within the drainages in and around the MPTR footprint. As a result, the SFS will not be impacted by the proposed range project. Additionally, GIS analysis and surveys confirmed no individuals or suitable habitat is present for rough-leaved loosestrife or Michaux's sumac within the project area; therefore, no impacts are expected.

Fort Bragg consulted with USFWS using the 35% project design on 24 November 2021 due to RCW impacts and tree removal within American chaffseed site SCAM023A (see Inclusion U for the biological assessment).

Federally endangered American chaffseed (*Schwalbea Americana*) site SCAM023A occurs within the proposed range construction area. SCAM023A is 1.4 acres; tree removal for line-of-sight range operation would be required in 1.15 acres within the 1.4-acre site (See Inclusion U, Figure 15). Grading or grubbing would not occur within the site to minimize American chaffseed damage.

Perimeter boundary signs will be posted around SCAM023A indicating prohibited foot and vehicular traffic within the site. Fire frequency may increase due to range operation, which would benefit SCAM023A fitness.

Range construction and operation will directly affect forage within RCW Clusters 22, 149, 151, 167, 251, and 560; however, these clusters will retain >120 acres of potentially good quality forage habitat (PGFQH) as defined by the 2003 RCW Recovery Guidelines (USFWS, 2003) to sustain cluster viability.

Although cluster 452 does not meet the recovery standard of > 120 acres of PGFQH pre- and post-project, it will incur minimal forage loss (0.73 acre) and sustain cluster viability. Tree removal associated with range construction, construction noise, and range operation (to include weapon firing and noise) will directly adversely impact 11 RCW clusters (110, 111, 112, 113, 114, 115, 152, 194, 271, 272 and 603) resulting in a 'take' as defined by Sections 7 and 9 of the

Endangered Species Act (ESA) See Inclusion U, Figures 10-11, and Table 4. Project construction will remove 11 cavity trees within Cluster 251; however, RCW Cluster 251 will maintain adequate PGFQH post-project. Loss of Cluster 251 may be avoided through cluster management if sufficient large trees are available nearby to support cavity provisioning.

Red-cockaded woodpecker group impact analysis determined that adjacent clusters within 1.25 miles of the affected RCW clusters would not be impacted by the proposed project. Additionally, analysis of surrounding RCW groups within a 3.7-mile dispersal radius of the impacted RCW clusters determined the proposed project would not affect dispersal of these surrounding neighborhood groups due to adverse group fitness, isolation, or habitat fragmentation; dispersal connectivity to the north and south of the MPTR will remain intact. Fort Bragg biologists analyzed RCW population effects and the ability of Fort Bragg to maintain 350 potential breeding pairs (PBGs) threshold within the RCW Sandhills East population post-project. Fort Bragg documented 521 active clusters and an estimated 461 PBGs in 2020. The effects analysis determined that the proposed action would incur incidental take of 11 RCW PBGs. Approximately 450 PBGs will remain post-project which is above the 350 PBG population recovery goal. No adverse group or neighborhood impacts are anticipated; therefore, the status quo population dispersal and group fitness will be maintained.

The USFWS issued a non-jeopardy biological opinion (BO) concurring with the Fort Bragg biological assessment 14 June 2022 and determination that the proposed project will adversely affect the RCW and America chaffseed, however, will not likely jeopardize the continued existence of both species (see Inclusion V). The ESA §7(b)(4) and §7(o)(2), which provide the authority for issuing an incidental take statement, do not apply to listed plant species. The USFWS provided an incidental take statement within the BO of 11 PBGs from the NC Sandhills East Primary Core Recovery Population (Clusters 110, 111, 112, 113, 114 115, 152, 194, 271, 272 and 603) and removal of 159 cavity trees directly resulting in the loss of 40 individual RCWs, and 20 RCWs indirectly affected by the proposed action.

The mandatory terms and conditions of the 14 June 2022 USFWS BO for the proposed action include:

- Develop and coordinate a cluster management plan to minimize loss of RCWs from clusters directly affected by range construction.
- Minimize/avoid impacts to red-cockaded woodpecker breeding groups during the breeding season (April – July).
- Develop a cluster management plan to minimize loss of RCWs from clusters that will be subject to heavy downrange impacts.

The USFWS also concurred with Fort Bragg's additional proposed mitigation measures and discretionary conservation measures to minimize American chaffseed and RCW impacts. See Inclusions U and V.

Cumulative Impacts:

Existing tank and maneuver trails will be utilized to access the MPTR; these trails have been or will be repaired. The TLWG, consisting of DPW and DPTMS personnel, vet all proposed training infrastructure projects. The TLWG determined existing infrastructure capable of supporting the MPF would require minimal repair and environmental impacts. Future infrastructure actions are also anticipated to have no effect to threatened or endangered species; however, actions that are determined to have a "may affect" on listed species will be assessed in accordance with ESA Section 7 consultation requirements.

Three TEMFs (PN 12289, PN 93098, and PN TBD) will be constructed in support of the MPF. All three projects occur within the quarter and half-mile forage partition of RCW Cluster 405 and are currently conceptual. See Inclusion W. These projects will require future threatened and endangered species assessment and potential ESA Section 7 consultation.

The IPBC construction, which will support MPF operation is anticipated to potentially affect 17 RCW clusters, one American chaffseed site, and seven SAR flora sites. Species locations associated with the IPBC do not overlap the MPTR; therefore, RCW group analysis and threatened/endangered flora impacts will be IPBC-specific. MPTR effects to RCW neighborhood and population analysis, and rare flora populations will have been factored into the environmental baseline for all considered species to determine IPBC impacts. A design iteration has not been issued in support of the IPBC to adequately analyze endangered species impacts; future consultation with the USFWS is required. See Inclusion L.

Future consultation with the USFWS will be required in support of the ARF+ construction. The ARF+ is expected to potentially affect two RCW clusters. MPTR effects to RCW neighborhood and population analysis will have been factored into the environmental baseline when determining ARF+ impacts.

The Scout range construction is anticipated to potentially affect seven RCW clusters and one American chaffseed site. MPTR effects to RCW neighborhood and population analysis, and rare flora populations will have been factored into the environmental baseline when determining range Scout impacts. A design has not been issued to adequately analyze endangered species impacts; future consultation with the USFWS will be required.

The construction and operation of the MPTR to include the MPF will result in a "no effect" determination for rough-leaved loosestrife, Michaux's sumac and the

SFS. Construction and operation of the MPTR results in a “may affect, likely to adversely affect” determination for the RCW and American chaffseed; Fort Bragg will implement mitigation and conservation measures for both the RCW and American chaffseed, and reasonable and prudent measures for the RCW. Endangered species impacts resulting from MPF TEMF construction, MPF infrastructure, and future range construction and operation (IPBC, ARF+ and Scout) will be analyzed once project location and design attributes are specified. Actions under Alternative 2 to include cumulative impacts will be non-significant.

4.2.3 Wetlands and Floodplains:

Well-drained, sandy hills dissected by dendritic wetland and small stream systems characterize the Sandhills region. Typical jurisdictional waters and wetlands on Fort Bragg include sandhill seeps, streamhead pocosins, small stream swamps, vernal pools, and open water habitats consisting of streams, rivers, and impoundments. The western project boundary intersects wetlands associated with Rockfish Creek. The USACE (33 CFR 328.3) and the EPA (40 CFR 230.3) defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands are important in several natural processes, including groundwater discharge and recharge, flood flow attenuation, sediment stabilization, nutrient removal or transformation, stormwater abatement, and as fish and wildlife habitat. Federal agencies will consider alternative actions and modify those actions to the extent feasible to avoid adverse wetland effects or potential harm pursuant to EO 11990. The EO 11990 requires federal agencies to avoid development within wetlands to the maximum extent possible when there is a practicable alternative. Section 404 of the CWA of 1977, as amended (33 USC 1344), regulates discharge of dredged or fill material into jurisdictional wetlands and open waters.

Floodplains moderate flood events, enhance water quality, recharge groundwater, and stabilize stream channels. Additionally, floodplains provide valuable habitat for fish, wildlife, and plants; recreational opportunities; and aesthetic benefits. The EO 11988 (Floodplain Management) requires federal agencies to “provide leadership and take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains in carrying out the agency’s responsibilities.” Additionally, EO 11988 defines floodplains as relatively flat lowland areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year (i.e., 100-year floodplain). The Federal Emergency Management Agency delineates the regulatory 100-year floodplain for use in the National Flood Insurance Program.

4.2.3.1 Potential Effects of the Proposed Alternatives

4.2.3.2 Alternative 1: No Action Alternative

Potential Impacts: Under the No Action Alternative, range construction and operation, or operation of the MPF would not occur. Therefore, this alternative would result in no impact to wetlands or floodplains.

Cumulative Impacts: The No Action Alternative would not have any significant cumulative impacts on wetlands or floodplains because no ground-disturbing activity to include range construction or MPF operation would occur.

4.2.3.3 Alternative 2: Construct and Operate a Multipurpose Training Range with MPF Gunner Capability

Potential Impacts: According to the Federal Emergency Management Agency (FEMA) website, the proposed project location is not located in any designated 100-year floodplain. See Inclusion X (FEMA, 2020a). Two wetland locations occur within the proposed project location and were delineated in 2020-2021. A 0.3-acre isolated wetland located within the project footprint to the north will be graded and filled resulting from the proposed action. Tree removal is required within an 8.8-acre wetland occurring in the southern portion of the project footprint; this wetland area will not be filled or graded, and all other vegetation will remain (Inclusion Y). Supporting electrical and communication lines will be directionally bored where Juniper Creek crosses Plank Road. The USACE has no jurisdiction over isolated wetlands; therefore, permitting and mitigation are not required for the associated grading and fill of the 0.3-acre isolated wetland. Similarly, converting a forested to non-forested wetland does not require permitting and, therefore, mitigation by the USACE. The State of North Carolina issued a State General Permit for Impacts to Isolated and Other Non-404-Jurisdictional Wetlands and Surface Waters Permit (number IWGP100000) to fill and grade the 0.3-acre isolated wetland. Forested wetland to non-forested wetland conversion does not require permitting by the NCDEQ because grading and grubbing will not occur within this 8.8-acre wetland. Best Management Practices will be implemented to minimize wetland impacts within the 8.8 wetland forested to non-forested conversion area. See Inclusion P and Z.

Federal agencies will consider alternative actions and modify those actions to the extent feasible to avoid adverse wetland effects or potential harm pursuant to EO 11990. The EO 11990 requires federal agencies to avoid development within wetlands to the maximum extent possible when there is a practicable alternative. Additionally, EO 11990 requires federal agencies to publish a FONPA and provide an opportunity for early public review of plans or proposals for new construction in wetlands. The draft FONPA is attached as Inclusion AA.

Wetlands will not be significantly impacted as defined by the DA as unpermitted loss or destruction of more than one acre of jurisdictional wetlands (2021).

Cumulative Impacts:

Three TEMFs (PN 12289, PN 93098, and PN TBD) will be constructed to support the MPF. The TEMFs are positioned 50-feet outside of a wetland buffering McPherson Creek according to the National Wetlands Inventory layer. A jurisdictional wetland delineation would be required to determine wetland impacts; an individual wetland permit (due to estimated project proximity and impacts) and associated mitigation may be required. The proposed TEMFs do not occur within a floodplain, see Inclusion Z (FEMA 2020b).

The TLWG determined existing infrastructure capable of supporting the MPF would require minimal repair and environmental impacts. As a result, there are no anticipated impacts to wetlands.

The eastern-most perimeter of the proposed IPBC range occurs within a designated floodplain (See Inclusion BB; FEMA, 2020c); additionally, preliminary IPBC locations indicate potential adverse impacts to wetlands and tributaries connected with Piney Bottom Creek, and Dry Branch. Associated impacts, permits and mitigation will be determined upon project design.

The proposed ARF+ does not overlay wetlands or a designated floodplain (See Inclusion CC; FEMA 2020d).

The proposed Scout range overlays wetlands and tributaries associated with Rockfish Creek. Associated impacts, permits and mitigation will be determined upon project design. The proposed Scout occurs within a designated floodplain (See Inclusion DD; FEMA 2020e).

5.0 IMPACT SUMMARY

No significant impacts will occur as a result of implementing the proposed action provided all mitigation measures as specified in this EA are achieved rendering an EIS and ROD unwarranted. The Army will prepare and publish a mitigated FNSI to document this decision. The mitigated FNSI will summarize briefly why the proposed action will not significantly affect the environment.

6.0 PREPARATION AND CONSULTATION

6.0.1 List of Preparers: This document was prepared for the Fort Bragg DPW by Ms. Ginny Carswell, NEPA Coordinator.

6.0.2 List of Agencies Consulted: The following agencies were consulted during the development of this EA:

- North Carolina State Clearinghouse Department of Administration, 116 West Jones Street, Raleigh, NC, 27603-8003.
- North Carolina Department of Environmental Quality Fayetteville Division, Fayetteville, NC, 225 Green Street Suite 714, Fayetteville, NC 28301-5095.
- North Carolina Department of Environmental Quality, 217 West Jones Street, Raleigh, NC 27693.
- United States Corps of Engineers, 69 Darlington Avenue, Wilmington, NC 28403.
- United States Fish and Wildlife Service, 551-F Pylon Drive, Raleigh, NC, 27606.

6.0.3 List of Persons Consulted: The following persons were consulted during the development of this EA and corresponding Inclusions:

- Acosta, Victoria. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Amacker, Wilfried. Installation Range Officer. DPTMS. Fort Bragg, NC.
- Ball, Brian. Biologist. ED, DPW, Fort Bragg, NC.
- Britcher, Jackie. Endangered Species Branch Chief, ED, DPW, Fort Bragg, NC.
- Carman, Sarah. General Engineer, USARMY DEVCOM GVSC, Warren, Michigan.
- Crawford, T. Kevin. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Cullen, Gary. Air Quality Program, ED, DPW, Fort Bragg, NC.
- Draeger, Scott. Department of the Army Technical Team Lead, TCM Ranges.
- Duncan, James. Solid Waste Program Manager, ED, DPW, Fort Bragg, NC.
- Fischer, Michael. Air Quality Program, ED, DPW, Fort Bragg, NC.
- Fleming, Rodney. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Fernandez, Kathy. Water Quality and Tanks Program, DPW, Fort Bragg, NC.
- Garcia, Paula. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Hair, Sarah (Liz). District Engineer, USACE Wilmington Regulatory Division, Wilmington, North Carolina.
- Hammond, John. Fish and Wildlife Biologist, USFWS, Raleigh, North Carolina.
- Hardy, Shawn. Solid Waste Program, ED, DPW, Fort Bragg, NC.
- Haven, Victor. TRADOC Capabilities Manager.
- Hoffman, Erich. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Huskins, Stacy. Botanist, ED, DPW, Fort Bragg, NC.
- Jenkins, Jamie. Physical Scientist, ED, DPW, Fort Bragg, NC.

- Kanabrocki, Michael. Chief, Civil Law Division, OSJA, HQ, XVIII ABN Corps Fort Bragg, NC.
- Lamson, Christopher. Water Quality and Tanks Program, DPW, Fort Bragg, NC.
- Locklear, Lance. Master Planner, DPW, Fort Bragg, NC.
- Luo, Jimmy. Senior Project Manager, Savannah District USACE, Savannah, GA.
- McMillan, Kenny. Water Management Branch, ED, DPW, Fort Bragg, NC.
- Patten, Janice. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Sapione, Canio (Bill). Master Planner, DPW, Fort Bragg, NC.
- Sanders, Kenneth. MPTR Range Construction Engineer. Dothan, AL.
- Schleier, Jonathan. Cultural Resources Support. ED, DPW, Fort Bragg, NC.
- Shillaci, Jessie. Wildlife Biologist, ED, DPW, Fort Bragg, NC.
- Sloop, Jeff. Air Quality Program, ED, DPW, Fort Bragg, NC.
- Turlington, Chad. Environmental Specialist, NCDEQ Fayetteville Regional Office, Fayetteville, NC.
- Vesley, Kristine. Master Planner, DPW, Fort Bragg, NC.
- Ward, Lee. Water Management Branch, ED, DPW, Fort Bragg, NC.
- Wilson, Jack. Hazardous Waste Program Manager, ED, DPW, Fort Bragg, NC.

6.0.4 Literature Cited

Amacker, W. *EA questions for MPTR/MPF* e-mail communication. 2 February 2021.

Augustus, Dwayne. 1 February 2019. *Attachment 6, MPF TOE, Equipment Summary*. TRADOC Capability Manager -Infantry Brigade Combat Team.

Council on Environmental Quality (CEQ), 1997. *Considering Cumulative Impacts Under the National Environmental Policy Act*. Washington, DC: Executive Office of the President, CEQ. January 1997.

Council for Environmental Quality. 1 Aug 2016 Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas (GHG) Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews.

Department of the Army (DA), 2002. *Environmental Effects of Army Actions* (Title 32 CFR Part 651), as published in the Federal Register, Vol. 67(61): 15290-15332. Washington, DC: Headquarters, DA. 29 March 2002.

Department of the Army (DA), 2004. *Master Plan, Fort Bragg, NC: Long Range Component*. Fort Bragg, NC: Prepared for DPW by Parsons Corporation under the direction of the United States Army Corps of Engineers-Savannah District. February 2004.

Department of the Army (DA) Futures Command, 2014. *Operational Mode Summary/ Mission Profile for Mobile Protected Firepower (MPF)*. May 2014

Department of the Army (DA) Futures Command, 2017. *Capability Development Document for Mobile Protected Firepower*. December 2017.

Department of the Army (DA) Maneuver Center of Excellence, 2017. *Mobile Protected Firepower (MPF) Company Operational and Organizational Concept (O&O)*. August 2017.

Department of the Army (DA) Combined Arms Center. *Fort Bragg FY 22 MPTR (Tech Team) Outbrief 8-9 Oct 2019*. October 2019.

Department of the Army (DA). *Mobile Protected Firepower (MPF) Life Cycle Environmental Assessment*. October 2021.

Federal Emergency Management Agency Flood Map Service (a). Accessed 23 March 2020. Available online at:
<https://msc.fema.gov/portal/search?AddressQuery=Fort%20Bragg#searchresultsanchor>

Federal Emergency management Agency Flood Map Service (b). Accessed 26 March 2020 (b). Available online at:
<https://msc.fema.gov/portal/search?AddressQuery=Fort%20Bragg#searchresultsanchor>

Federal Emergency Management Agency Flood Map Service (c). Accessed 30 April 2021. Available online at:
<https://msc.fema.gov/portal/search?AddressQuery=28310#searchresultsanchor>

Federal Emergency Management Agency Flood Map Service (d). Accessed 1 September 2021. Available online at:
<https://msc.fema.gov/portal/search?AddressQuery=Fort%20Bragg%20North%20Carolina#searchresultsanchor>

Federal Emergency Management Agency Flood Map Service (e). Accessed 1 September 2021. Available online at:
<https://msc.fema.gov/portal/search?AddressQuery=Fort%20Bragg%20North%20Carolina#searchresultsanchor>

Fort Bragg Joint Land Use Study, Accessed 24 February 2020. Available online at: <https://www.rluac.com/jlus>

HDR. Fort Bragg Out-Brief PN 12289 (Medium TEMF) 24 April 2020.

IPCC (Intergovernmental Panel on Climate Change). 2007. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.

North Carolina Department of Commerce. Fort Bragg 2018 Joint Land Use Study, Accessed 24 February 2020. Available online at: <https://www.rluac.com/jlus>

North Carolina Department of Environmental Quality, 2013. *Erosion and Sediment Control Planning and Design Manual*. Available online at <https://files.nc.gov/ncdeq/Energy%20Mineral%20and%20Land%20Resources/Land%20Resources/Land%20Quality/Erosion%20and%20Sediment%20Control%20Planning%20and%20Design%20Manual/Erosion-Design-Manual-Rev.-May-2013-compressed.pdf>.

North Carolina Division of Water Quality, 2005. *Water Classification and Standards Unit*. Available online at <http://h2o.enr.state.nc.us/csu/>.

South Carolina Institute of Archaeology and Anthropology Applied Research Division (SCIAA-ARD). Management Summary Phase II Archaeological Testing of 14 Sited in Cumberland, Hoke, Richmond, and Scotland Counties Fort Bragg, North Carolina. August 2019.

United States Department of Agriculture Soil Survey Custom Report. Accessed 19 March 2020. Available online at:

<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

United States Corps of Engineers Savannah District. Army MILCON Parametric Design Report – Lite; Automated Multipurpose Training Range – Draft. October 2020.

United States Environmental Protection Agency Environmental Justice Screening and Mapping Tool (Version 2020). Accessed 21 April 2021. Available online at <https://ejscreen.epa.gov/mapper/>.

United States Geological Survey. Accessed 19 March 2020. Available online at: <https://ngmdb.usgs.gov/topoview>

U.S. Fish and Wildlife Service. 2003. Red-cockaded woodpecker (*Picoides borealis*) Recovery Plan: Second Revision. U.S. Fish and Wildlife Service, Atlanta, GA.

U.S. Fish and Wildlife Service. 1998. Endangered species consultation handbook: procedures for conducting consultation and conference activities under Section 7 of the Endangered Species Act. U.S. Fish and Wildlife Service and National Marine Fisheries Service. Washington D.C.

6.0.5 Federal and State Regulations Cited: The following applicable federal and state statutes and regulations were considered during the development of this document.

- Clean Water Act, 33 U.S.C. §§ 1251-1377 (1972; as amended 1994).
- General Permit for Stormwater Discharge from Construction Activities, Section 402, CWA.
- Environmental Protection Agency, Protection of Environment, 32 CFR Part 260-299.
- Endangered Species Act of 1973 (as amended), U.S. Fish and Wildlife Service, Washington, DC, 1988.
- Environmental Analysis of Army Actions, 32 CFR Part 651.
- National Environmental Policy Act of 1969 (as amended; 40 CFR 1500 et seq.), U.S. Environmental Protection Agency, Washington, D.C., 1975.
- National Historic Preservation Act 16 U.S.C. §§ 470a et seq. (1966, as amended 2016).
- National Pollutant Discharge Elimination System General Permit for Storm Water Discharge from Construction Activities, Section 402, CWA.
- Government Printing Office (GPO), 1997. Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks). Federal Register: Vol. 62, p. 19885. Washington, DC: GPO. 21 April 1997.
- Government Printing Office (GPO), 1994. Executive Order 12898 (Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations). Federal Register, Vol. 59:7629 (1994), amended by Executive Order No. 12948 (Federal Register, Vol. 60: 6381 (1995)). Washington, DC: GPO. 11 February 1994.
- Government Printing Office (GPO), 1977. Executive Order 11990 (Protection of Wetlands). Federal Register, Vol. 42: 26961 (Title 3 CFR, 1977, Comp., p. 121). Washington, DC: GPO. 1977. GPO. 1977.

7.0 DISTRIBUTION LIST: The following libraries and agencies have received copies of the EA and draft mitigated FNSI as part of the internal and public review and comment process on this document. The EA will also be posted online at <https://fb.me/FortBraggEnvironmentalAssessments>.

7.0.1 Libraries:

- Cumberland County Public Library, 300 Maiden Lane, Fayetteville, NC 28301.
- John L. Throckmorton Library, Building 1-3346, Randolph Street, Fort Bragg, NC 28310.
- Harnett County Library, 601 South Main Street, Lillington, NC 27546
- Hoke County Public Library, 334 N. Main Street, Raeford, NC 28376
- Moore County Library, 101 Saunders Street, Carthage, NC 28327

7.0.2 Agencies

- North Carolina State Clearinghouse Department of Administration, 116 West Jones Street, Raleigh, NC, 27603-8003.

- XVIII Airborne Corps and Fort Bragg, NC 28310
 - (a) Garrison Commander (AMIM-BGG-ZA)
 - (b) Office of the Staff Judge Advocate (AMIM-BGG-JA)
 - (c) Directorate of Public Works (AMIM-BGP)
 - (d) Environmental Division (AMIM-BGP-E)

Inclusion A: MPF Equipment Allocation



MOBILE PROTECTED FIREPOWER COMPANY CAV SQDN



COMPANY HEADQUARTERS			
<p>CPT 19A00 CDR SGT 19K20 GNR/ASST TC SPC 19K10 TNK CREWMAN</p> 	<p>x3</p> 		
<p>1LT 19A00 EXEC OFF SGT 19K20 GNR/ASST TC SPC 19K10 TNK CREWMAN</p> 	<p>MSG 19Z5M 1SG SGT 74D20 CBRN NCO</p>	<p>SGT 92Y20 SUPPLY NCO SPC 92Y10 SUPPLY SP</p> 	
3 X TANK PLATOON			
<p>1LT 19A00 PLT LDR SGT 19K20 GNR/ASST TC SPC 19K10 TNK CREWMAN</p> 	<p>SFC 19K40 PLT SGT SGT 19K20 GNR/ASST TC SPC 19K10 TNK CREWMAN</p> 	<p>SSG 19K30 TANK CDR SGT 19K20 GNR/ASST TC SPC 19K10 TNK CREWMAN</p> 	<p>SSG 19K30 TANK CDR SGT 19K20 GNR/ASST TC SPC 19K10 TNK CREWMAN</p> 

The 3 JLTVs listed above provide primary transportation for the Company 1SG and alternate means of transportation for the Commander and XO.



MOBILE PROTECTED FIREPOWER COMPANY CAV SQDN



COMPANY HEADQUARTERS			
<p>CPT 19A00 CDR M4 XM-17 SGT 19K20 GNR/ASST TC M4 XM-17 SPC 19K10 DVR M4 XM-17 SPC 19K10 LDR (if necessary) M4 XM-17</p> 	<p>GREN LAUN X2 NVG .50 CAL MG AN/VRC-92F 7.62mm MGx2 JBC-P ANIUYK</p>	<p>x3</p> 	
<p>1LT EXEC. OFF. 19A00 CDR M4 XM-17 SGT 19K20 GNR/ASST TC M4 XM-17 SPC 19K10 DVR M4 XM-17 SPC 19K10 LDR (if necessary) M4 XM-17</p> 	<p>GREN LAUN X2 NVG .50 CAL MG AN/VRC-92F 7.62mm MGx2 JBC-P ANIUYK</p>	<p>MSG 19Z5M 1SG M4 SGT 74D20 CBRN NCO</p>	<p>SGT 92Y20 SUPPLY NCO SPC 92Y10 SUPPLY SP</p>
<p>1LT 19A00 XO SGT 19K30 MG</p>	<p>x2 NVG x3 .50 CAL MG AN/VRC-92F JBC-P ANIUYK</p>	<p>CPT 19A00 CDR SGT 25U20 FWD SIG SPT M4</p>	<p>X2 NVG AN/VRC-90F .50 CAL MG GEN. SET G18358 COM SYS ANITYQ-109</p>
3 X TANK PLATOON			
<p>1LT 19A00 CDR M4 XM-17 SGT 19K20 GNR/ASST TC M4 XM-17 SPC 19K10 DVR XM-17 PFC 19K10 LDR (if necessary) XM-17</p> 	<p>GREN LAUN X2 NVG .50 CAL MG AN/VRC-92F 7.62mm MGx2 JBC-P ANIUYK</p>	<p>SFC 19K40 CDR M4 XM-17 SGT 19K20 GNR/ASST TC M4 XM-17 SPC 19K10 DVR XM-17 PFC 19K10 LDR (if necessary) XM-17</p> 	<p>GREN LAUN X2 NVG .50 CAL MG AN/VRC-92F 7.62mm MGx2 JBC-P ANIUYK</p>
<p>SSG 19K30 CDR M4 XM-17 SGT 19K20 GNR/ASST TC M4 XM-17 SPC 19K10 DVR XM-17 SPC 19K10 LDR (if necessary) XM-17</p> 	<p>GREN LAUN X2 NVG .50 CAL MG AN/VRC-92F 7.62mm MGx2 JBC-P ANIUYK</p>	<p>SSG 19K30 CDR M4 XM-17 SGT 19K20 GNR/ASST TC M4 XM-17 SPC 19K10 DVR XM-17 SPC 19K10 LDR (if necessary) XM-17</p> 	<p>GREN LAUN X2 NVG .50 CAL MG AN/VRC-92F 7.62mm MGx2 JBC-P ANIUYK</p>
ALPHA SECTION		BRAVO SECTION	

The 3 JLTVs listed above provide primary transportation for the Company 1SG and alternate means of transportation for the Commander and XO.



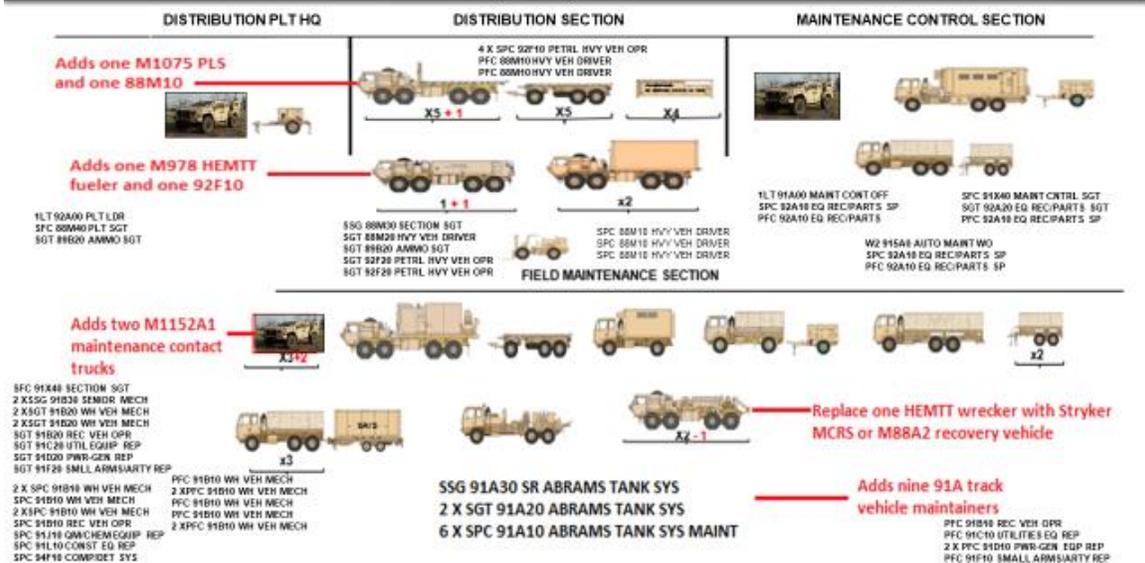
EQUIPMENT SUMMARY



• A79381	ANTENNA GROUP: OE-254/GRC	2	P99881	PROC DATA CAISI 2.0:	1
• B49272	BAYONET-KNIFE: W/SCABBARD FOR M4 RIFLE	62	Q03468	QUADRANT FIRE CONTROL: GUNNERS	14
• B57077	BATTLEFIELD ANTI-INTRUSIONS SYS: ANIPRS-9	3	R20684	RADIAC SET: AN/VDR-2	4
• B67766	BINOCULAR: MOD. CONSTR. SCALE RET. 7X50	16	R30925	RADIAC SET: AN/PDR-75A	1
• B90494	BORESIGHTING EQUIP: WEAPON W/MUZ ALIG	14	R31061	RADIAC SET: AN/UDR-13	4
• C05002	COMPUTER SYS: DIGITAL: ANIPYQ-10(C)	7	R44999	RADIO SET: AN/VRC-89F (C)	8
• C05036	M4 5.56MM	32	R45543	RADIO SET: AN/VRC-92F	3
• D03932	DETECTING SET: MINE AN/PSS-14	2	S45729	SIGHT BORE OPTICAL: M150	1
• E03826	ELECTONIC TEST SET: TS-4348/UV	4	S60288	SIGHT: REFLEX COLLIMATOR	31
• E05008	ENCRYPTION-DECRYPTION EQUIP: KGV-72	16	S90535	MED. WPN. THER. SIGHT (MWTS): AN/PAS-13(V)2	14
• G18358	GEN. SET: DED SKID MTD. 3KW 60HZ	1	S90603	HVY. WPN. THER. SIGHT (HWTS): AN/PAS-13(V)3	16
• J00697	JOINT CHEM AGENT: DETECTOR	4	T05038	TEST SET RADIO AN/PRM 36:	1
• L02015	LIGHTING KT: MOT. DETECT. (LKMD) AN/GAR-2	12	T40405	TAPE READER GEN PURPOSE: KCI-18/TSEC	2
• L44680	SMOKE GRENADE LAUNCHERS	14 SETS	T59448	TRUCK CARGO: W/O WINCH	0
• L44748	LAUNCHER GRENADE ARM SUB: SCRN. M259	1	T62350	TEST KIT MASK PROT: M41	1
• L69080	LAUNCHER GRENADE: M320A1	4	W34648	TOOL KIT CARPENTERS: ENG. SQUAD WICHEST	1
• L92352	MG. 7.62mm: FIXED	28	W51910	TOOL KIT SMALL ARMS REPAIRMAN: ORDANCE	1
• M12647	MOUNT MG: 40MM MK93	18	W98825	TRAILER TANK: WATER 400 GAL. 1 1/2 TON 2 WHL.	1
• M12986	MASK CHEM. BIO. JNT SRV. GEN PUR: FLD M50	3	X05002	M205: MACHINE GUN TRIPOD (MG)	2
• M13236	MASK CHEM.BIO. CMBT VHL CREWMAN M51	62	Z05253	JOINT LIGHT TACT. VEH. (JLTV): 4 SEAT GP.	3
• M39331	MG: CAL 50	18	Z05272	COMPUTER SET: GEN. INFO. DATA AN/GYK-74	1
• M74364	MOUNT GUN: RING CAL 50	1		MOB. PROTECTIVE FIREPOWER	14
• N05482	NIGHT VISION GOGGLES	62	Z05403	RAVEN: MED. RANGE MOB. (MRM) UAS	1
• N96248	NAV. SET: SATEL. SIGNALS AN/PSN-13	18	Z05439	GENERAL PURPOSE CARRIER:	0
					3



FORWARD SUPPORT COMPANY (CAV) BSB





FORWARD SUPPORT COMPANY (CAV) BSB



COMPANY HEADQUARTERS

CPT 88A88 CDR
SPC 92Y18 SUPPLY SP



1LT 88A00 EXEC OFF
MSG 94Z5M1SG
SGT 92Y20 SUPPLY MCO



FIELD FEEDING SECTION



SFC 92G40 SR FOOD OPS SGT
SSG 92G30 FOOD OPNS MGR
SGT 92G28 FOOD OPNS MCO
SGT 92G28 FOOD OPNS MCO
SPC 92G18 FOOD OPS SP
3 X SPC 92G10 FOOD OPS SP
SPC 92G48 FOOD OPS SP
3 X PFC 92G18 FOOD OPS SP

x3



MPF Schematic



FOR OFFICIAL USE ONLY

Requirements (w/ CSA Guidance)



CSA Priorities: The Army approach for MPF acquisition is focused on minimal to moderate development to avoid a lengthy schedule and high cost of a new development program to meet the time requirement of **First Unit Issued in FY23 (Fort Bragg)**

LETHALITY

Primary Weapon

- 105MM – Main Gun
- 14 Ready total 21 Stowed Main Rounds
- -8° to +15° frontal 180° azimuth
- 0° to +15° rear 180° azimuth
- -10° to +60°, 360° azimuth (O)

Secondary Weapon system

- 1000 ready rounds, 3400 stowed

Commander's Independent Weapon system

- .50 cal

Optics

- Sensor performance commensurate with US ground combat vehicles



PROTECTION

Exterior

- Frontal and 360° KE protection
- Overhead Protection
- 0.5X Underbelly
- Smoke Grenade Launchers
- RPG (O)
- EFP protection (O)

Interior

- NBC Protection (T), Over-pressurization (O)
- Automatic Fire Suppression System

Provide protection

Provide overwhelming precision firepower

Move rapidly across a variety of terrain

MOBILITY

- Pivot Steer w/in 1.5 times vehicle length (T)
- Controlled 32' diameter 360° turn (T), 27' (O)
- Vehicle Cone Index 1 (VCI-1) no greater than 25
- Cross-country mobility with ride quality (absorbed power of no more than 6 Watts)
- 32° vertical climb (T), 40° (O)
- 36° fording capability (T), 60° with fording kit (O)
- 2 meters gap crossing (T), 2.5m (O)
- 40MPH sustained speed on hard services
- Drivers all weather viewer

UNCLASSIFIED // FOR OFFICIAL USE ONLY // Pre-Decisional

TRANSPORTABILITY

- 2x MPF with roll-on-roll-off capability from C-17

SUSTAINABILITY

- Ao - 57%(T) / 96%(O) for 72hr Seize Initiative Phase

Use or disclosure of data contained on the page is subject to restrictions on title page.

FOR OFFICIAL USE ONLY

Inclusion B:

Draft Stationing Summary

AR 5-10 STATIONING SUMMARY
FY25-1 FORCE STRUCTURE ACTIONS
AT FORT BRAGG, NORTH CAROLINA

The stationing for the activation of the Mobile Protective Firepower (MPF) Battalion is in the planning and programming phase pending final decision on the stationing location and is not documented in SAMAS or ASIP. Final stationing decision is based upon future Army Senior Leader decisions and the ability of an installation to best support the Mobile Protective Firepower Battalion.

Activation

UNIT	UIC
MOBILE PROTECTIVE FIREPOWER (MPF) BATTALION	X17

Stationing Summary

1. MOBILE PROTECTIVE FIREPOWER (MPF) BATTALION (X17). Mobile Protected Firepower (MPF) provides a capability that enables the Infantry Brigade Combat Team (IBCT) to maneuver and survive in close combat against hardened enemy fortifications, light armored vehicles, and personnel to deter or defeat near-peer threats.

2. Nature of action.

a. FORSCOM activates the MPF Battalion in accordance with the MPF Force Design Update (FDU) and Total Army Analysis (TAA) 24-28 to activate one MPF Battalion at Fort Bragg, NC, no later than FY25. The requirement for an MPF capability is directly linked to Large Scale Combat (LSCO) Gap 11, Brigade Combat Teams Lack of Mobility and Lethality. This is addressed by the MPF CO FDU currently at DA in TAA 23-27. In May 2020, CG CAC directed the MCoE to focus on development of a MPF Battalion design with the mission to train, sustain, and provide administrative oversight (TRO) for its three MPF Companies for tactical employment by the division's IBCTs.

b. The unit is not associated with Base Realignment and Closure (BRAC) 2005 directed actions.

3. Rationale.

a. The Army is building a future force structure shaped by new and emerging threats, technological advances, force caps, and a prevalence of Joint operations. Building the future Army involves a modernization plan which relies on a capabilities-based assessment and integrated capabilities doctrine. The strategic stationing process involves analysis based on guidance to adjust force structure stemming from the Quadrennial Defense Review, the Office of the Secretary of Defense Resource Management Decisions, the Total Army Analysis (TAA), Force Design Updates (FDUs), Command Implementation Plans (CIPs) and senior leadership (SLDA) decisions.

b. Changes in the Operational Environment in order to engage and destroy near peer threats have identified IBCTs that confront enemy forces do not have an organic platform that possesses the lethality, mobility, and survivability to close and destroy the enemy. This requirement led to the MPF company. In May 2020, CG CAC directed the MCoE to focus on development of a MPF "Training" Battalion FDU as a follow up action to the MPF Company FDU. The solution was to reorganize one Motorized Troop in the Cavalry Squadron, IBCT into a MPF Company to provide a significant capability that supports offensive and defensive operations while in an Infantry support role as well as supporting Reconnaissance and Security (R&S) operations. The first unit equipped is scheduled to occur in FY25.

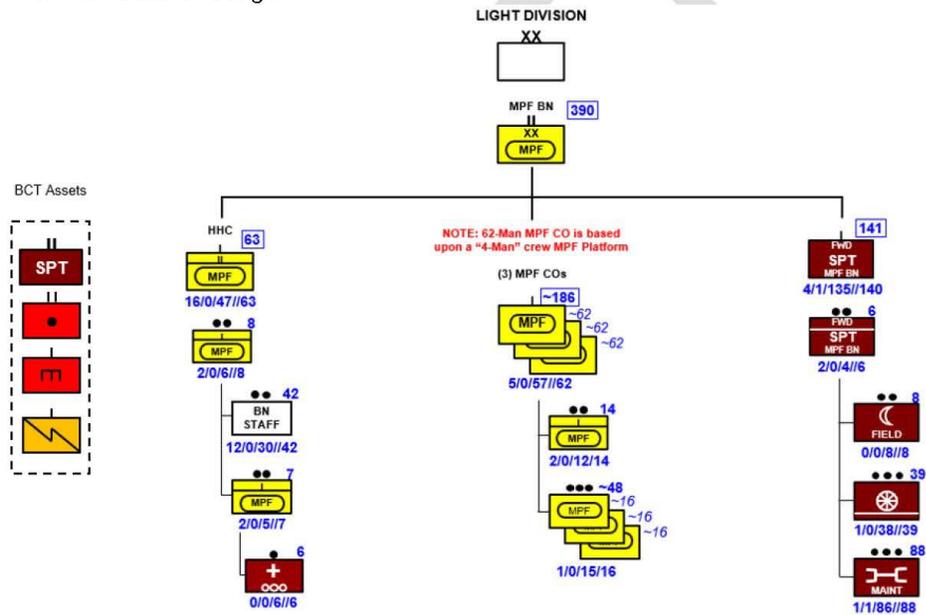
c. The MPF company design to enhance and reorganize one Infantry Brigade Combat Team Cavalry Motorized Troop (SRC 17217K) in the Cavalry Squadron and its scout platoons into a standard Mobile Protected Firepower Company organization using existing personnel strength.

d. The MPF battalion design builds on the MPF Company FDU to oversee the training, maintenance, and leadership development of the MPF Companies for tactical employment by the Division's IBCTs. Offset the cost by utilizing the space savings from the Armored and Infantry Division Cavalry Squadron FDUs.

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

- 1) The 92 x spaces from 1x Motorized CAV Troop from an IBCT Cavalry Squadron will be used per IBCT to pay the 86 x space bill for 1x MPF CO.
- 2) The Light DIV CAV FDU uses three IBCT CAV Squadrons, with their associated FSCs, within a three-brigade infantry division as bill payers (no growth) and retains organic IBCT R&S capability. Frees 111 spaces for MPF BN.
- 3) The MPF FDU creates an MPF BN organization by adding a HQ Company and FSC to the MPF Company FDU which is currently at HQDA for TAA 23-27.
- 4) The Armored DIV CAV FDU uses three armored CAV Squadrons with their associated FSCs, within a three-brigade armored division as bill payers and retains organic ABCT R&S capability. This design is intended as a pilot and the numbers reflect one AR DIV. Frees 283 spaces for MPF Battalion.

e. MPF Battalion Design.



4. Alternatives to the proposed action.

- a. The location for the activation at Fort Bragg, NC, was selected based on the location of the XVIII Airborne Corps and consistent with assigning the MPF to support IBCTs within a light division. The MPF Battalion is designed to be located with the Joint Force Entry Corps and Division. MPF Battalion provides fully manned, equipped, and trained MPF Companies to support IBCTs within a Light, Air Assault, or Airborne Infantry Division. The MPF Battalion will consist of an HHC, three MPF Companies, and FSC which will reside at the Division level. Because deploying the MPF Battalion unit equipment is significant, one of the stationing considerations was that the location must have the capability for the

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

whole organization to deploy intact. Pope Army Airfield has the platform and capability to support a more rapid deployment of the MPF Battalion.

b. An in-depth analysis was conducted to determine the most effective stationing of this unit. The proposed stationing plan best positions FORSCOM to support combatant commanders. The status quo option of not providing the stationing approval is not considered a viable course of action since the HQDA directed actions are required to support the current manpower structure.

5. Strategic and operational implications.

a. Currently IBCTs that confront enemy forces do not have an organic platform that possesses the lethality, mobility, and survivability to close with and destroy the enemy. The mission of the MPF Battalion is to provide Training Readiness Oversight (TRO) ensuring better trained MPF crews, Sections, and Platoons. It also enhances standard maintenance, leader development, and crew stabilization. The MPF BN organization adds a HQ Company and FSC to the MPF Company FDU which is currently at HQDA for TAA 23-27.

b. Army force realignment allows for the adjustment of the composition of forces to compete below the level of armed conflict with great powers and be ready for Large Scale Combat Operations (LSCO), the Army must precisely allocate resources to sustain sufficient tactical readiness, achieve strategic readiness goals and secure its future readiness by resourcing modernization initiatives. Capabilities are both reduced and grown to achieve a balance across components.

c. The implementation of Army force realignments addresses capabilities necessary to increase lethality and survivability to set conditions to ensure ready and available Total Army forces, implements the National Defense Strategy, and synchronizes Readiness and Modernization investments to incorporate new capabilities, doctrine, and force structure for a Multi-Domain Operations (MDO) capable force in 2028 and the MDO-ready force in 2035.

6. Estimated military and civilian personnel impacts. The force structure change included in this stationing package results in a net increase of 390 military authorizations at Fort Bragg for FY25. The 390 personnel spaces will be used to field one MPF BN, FSC, and three MPF Companies. Pays the MPF BN bill w/ 4 in excess: 283 space savings from AR DIV CAV FDU and 111 space savings from IN DIV CAV FDU. See Manpower Migration Diagram for specific authorization changes.

7. Programs to provide assistance to affected personnel. There are no anticipated issues pertaining to the garrison's ability to provide services to Soldiers and/or family members. Fort Bragg will inform all affected personnel of the Army's assistance programs, benefits, and entitlements available to them. *(From AR 5-10: Provide assurances that both military and civilian personnel have been informed about assistance programs, benefits, and entitlements available to them as a result of the proposed action.)*

8. Anticipated cost and savings. *(From AR 5-10: Describe the one-time and steady state new annual recurring savings and costs. Be prepared to provide a detailed summary display of both one-time and recurring costs and savings (See AR 5-10, Fig 5-3) if requested by HQDA.)*

Example: *The proposed restationing action will increase the Army's costs in several ways – mostly in one-time MILCON, and annual reoccurring costs for Facility Sustainment (FSRM) and Base Operations Support (BOS) associated with child development centers. The 131-person unit is projected to have about 96 school aged children (aged 0 to 11) accompanying it. Of those, about 25 percent typically*

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

need Child Development Center (CDC) or School Aged part-time Child Care (SACC) services (i.e., 13 CDC slots and 11 SACC slots). The stationing action will increase the requirement for a larger MILCON project for a planned Child Development Center (a medium CDC would need to become a large at an increased cost of \$15.5M through FY26. A larger CDC would also produce a larger annual facilities operations cost at roughly \$9.50/SF per year for an additional 9,582 SF or \$91,029 per year (27,718 SF for a medium CDC vs 37,300 SF for a large CDC). The increased cost to staff a large CDC (vs a medium) is \$1.2M per year (a medium CDC costs \$2.5M/year, as compared to the requirement for a large CDC at \$3.7M/year). Until the large CDC is built and operating, the additional costs for Tuition Fee Assistance to rely on off-post providers for the additional 13 CDC and 11 SACC slots, is estimated at \$95,000/year.

Additionally, if an already planned operational MILCON project scope is not adjusted, approximately \$50,000/year in higher facilities costs would be incurred as Fort Gordon operates a ~5,300 SF larger footprint above the previous projected baseline.

b. One-time costs. The total one-time cost is \$NNN.NM to prepare facilities for stationing.

1) New Facilities requiring Military Construction (MILCON). Costs for new facilities and equipment purchases (administrative, operational, storage, arms room, motor pool, SCIF, and barracks facilities). There are estimated Military Construction (MILCON) and restoration and modernization (SRM) /OMA projects at \$NN.NM required to support these actions.

2) Facility Modification requiring Restoration and Modernization (R&M) or Sustainment, Restoration and Modernization (SRM) projects. Costs to prepare the facilities for stationing (renovations and/or modifications to administrative, operational, storage, arms room, motor pool, SCIF, and/or barracks facilities). There are estimated requisite Restoration and Modernization (R&M) projects at \$NN.NM for renovations required to support these actions.

3) NETCOM costs. Costs for infrastructure, IT network, and furnishings for stationing. The estimated one-time cost is \$NNN.NK for infrastructure, IT network, and furnishings to support this action.

4) Second Destination Transportation (SDT) shipment costs for all relocation loss actions, activations, and conversions. The estimated SDT costs for the shipment of equipment from the Army's identified installations to Fort Bragg, NC, will not exceed \$xx,xxx based on the Deputy Assistant Secretary of the Army for Cost and Economics (DASA CE) Forces Cost Estimate (FCE) model. The Army G-4 will determine the final equipment and shipping costs when it issues unit equipment instructions.

5) Equipment costs. Unit information was input into the Deputy Assistant Secretary of the Army for Cost and Economics (DASA CE) Forces Cost Estimate (FCE) model to predict the equipping, operating, and sustaining cost of a unit for one year, using fiscal year 2025 (FY25) as the base year (BY). The equipping cost for a MPF Battalion is the cost of procuring the equipment needed to implement the action. FCM estimates procurement cost based on Army supply bulletin Line Item Number (LIN) prices. The estimated one-time cost for acquisition of new equipment for the MPF Battalion is \$14,237,214.00. This estimate does not include 42 MPF platforms that will be issued to the three companies. MPF Milestone Decision (C) is scheduled for 3Q FY22 and total FDU equipment cost remains unknown until the platform is selected. See Equipment Migration Diagram for list by LIN and Nomenclature. Army G-4 will determine final equipment and shipping costs when it issues unit equipment instructions.

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

c. Annual recurring costs. The total annual recurring cost increase is \$NNN.NK at Fort Bragg for FY25.

- 1) FORSCOM costs. There are no anticipated costs associated with this action.
- 2) IMCOM costs.

a) The anticipated annual recurring BASOPS support cost increase is \$877.5K. Base operations costs have fixed cost (facilities and utilities) and variable costs (services MDEPs that are dependent on population). The cost per Soldier is based on SAG 131 minus the fixed costs. Formula for calculating cost are shown below.

$$\text{Formula} = (\text{Cost per PAX}) \times (\text{Net Population Change})$$

$$\text{Cost increase} = (\$2.25\text{K}) \times (390) = \$877.5\text{K}$$

- b) \$xxx.xxK for Real Property Maintenance.
- c) \$xxx.xxK for Tuition Fee Assistance to support estimated increase for off post child care to support estimate increase in child development care (CDC) and school age child care (SACC).
- d) \$xxxK for estimated xx Certificate of Non-Availability(CNA) due to lack of barracks availability.
- e) \$xxxK for Family Programs.

d. Logistics Readiness Center (LRC) Costs. No LRC costs were determined through analysis. The anticipated LRC costs are \$NNN.NK.

e. NETCOM costs. There are no anticipated costs associated with this action. The anticipated recurring cost increase for information technology support is \$NNN.NK.

9. Facilities requirements. Current estimates for Military Construction (MILCON) and Military Construction Appropriations (MCA) project are estimated at \$NNN.NN and captured in the Cost and Cost Savings Summary. Current estimates for facilities renovation and furnishings costs are \$NNN.NN and captured in the Cost and Cost Savings Summary. *(From AR 5-10: Describe what facilities must be constructed, converted, renovated, or leased to implement the action and provide facility costs and cost avoidance for both losing and gaining installations. Identify specific projects, by fiscal year, which must be constructed to implement the preferred alternative or must be canceled as a result of the action. Additionally, the DCS, G-6/CIO, through the Information Systems Engineering Command will assist in identifying Information Technology requirements and developing cost estimates that must be included in total facility costs.)*

a. Using the Real Property Planning and Analysis System (RPLANS) from the Facility Engineers based on the number of personnel and grade levels, the unit requires the following square feet (SF) of consolidated space:

UNIT NAME	ADMIN (SF)	MAINT (SF)	BILLETS (SP)
BN HQ (M) (14183)			

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

COF (5) (14185)			
TEMF (L) (21410)			
OVP (85210)			

b. Units will utilize administrative, operational, storage, arms room, motor pool, and barracks facilities as directed by the installation Directorate of Public Works (DPW) based on the installation Facility Reutilization Plan. Based on this plan, the units will have the following facilities disposition at Fort Bragg upon completion of force structure action. Current estimates for facilities repairs, renovation, and furnishings costs are \$NNN.NNK. The following are DA Form 4283 Individual Job Order (IJO) projects for Restoration and Modernization (R&M), Sustainment, Restoration and Modernization (SRM), Base Operations Support (BOS), and Operations and Maintenance Appropriations (OMA) requirements submitted to support these actions and are funded or not funded (attach a copy of the corresponding DA Form 4283/DD Form 1391 to the stationing package):

UNIT / PROJECT TITLE / BUILDING #	IJO NUMBER	PROGRAMMED AMOUNT (\$)	REQUESTED FISCAL YEAR	DESCRIPTION OF WORK / TYPE OF FUNDS (OMA, BOS, R&M)
i.e., MDTF Phase 1 - TEMF BLDGS 03231, 03232, 03233, 03234 - MA 9A and 9B (MDTF BSC)	CJA200100J	\$500K	2020	Contract includes BLDGS 3231, 3232, 3233, 3234 (MA 9A and MA 9B). Project supports phase 2 action as well. Two R&M projects on-going (heat & electric); FY20 R&M \$500K to paint, patch, repair all four TEMFs. (R&M funds)

FISCAL YEAR	TOTAL COST (\$)
2025	\$500K
2026	
2027	

c. Any construction and demolition will be in accordance with 32 Code of Federal Regulations (CFR) Part 651, Appendix B, Section II, CX (c) (1) with a Record of Environmental Consideration (REC) completed.

d. The following MILCON project numbers were provided by the Army G-9 and identified as funded or not funded in the Facilities Investment Plan (FIP):

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

Project Number (PN)	Project Name	LOE (Dropdown)	Predominant CATCODE	RPUID	Facility Numbr	FIP 21 Detailed Funding Tye	Funded FIP 21?	FIP 21 FY	FIP 21 Projected Co	FIP 22 Updated Projected Co	FIP 22 Detailed Funding Type (Dropdown)	MCON New/Replace (Dropdown)
12289	Tactical Equipment Maintenance Facility	LOE 3	21410	TBD	TBD	MCON-MCA	Yes	31	\$27,000,000	\$27,000,000	MCON-MCA	New
93098	Tactical Equipment Maintenance Facility	LOE 3	21410	TBD	TBD	MCON-MCA	No	Not Funded	\$59,000,000	\$61,000,000	MCON-MCA	New
FA-22008-20	Repair BRD 28A	LOE 2	85730	1278971	BRD28A	RM	No	Not Funded	\$1,000,000	\$1,000,000	RM	
FA-22122-21	Repair BRDGP	LOE 2	85730	1047517	BRDGP	RM	No	Not Funded	\$1,000,000	\$1,000,000	RM	
FA-22121-21	Repair BR112	LOE 2	85730	1047698	BR112	RM	No	Not Funded	\$1,000,000	\$1,000,000	RM	
FB-26001-20	Repair tank trail system for MPF Phase 1	LOE 2	85725	TBD	TNKTR	RM	No	Not Funded	\$4,680,000	\$4,680,000	RM	
FB-26002-20	Repair tank trail system for MPF Phase 2	LOE 2	85725	TBD	TNKTR	RM	No	Not Funded	\$1,700,000	\$1,700,000	RM	
FA-26002-21	Repair tank trail system for MPF Phase 3	LOE 2	85725	TBD	TNKTR	RM	No	Not Funded	\$750,000	\$750,000	RM	
FB-26003-21	Repair Tank Trail System FOR MPF Phase 3 (grave at inv)	LOE 2	85725	TBD	BRIDG	RM	No	Not Funded	\$750,000	\$750,000	RM	
FA-26004-21	Repair Vehicle Maintenance Shop to Q1, C7727 82nd ABN	LOE 2	21410	1063598	C7727	RM	No	Not Funded	\$1,073,000	\$1,073,000	RM	

e. The estimated total ROM cost and required category codes for the activation of the MPF Battalion at Fort Bragg provided by the Army G-9:

TITLE	CONTROL NUMBER	FISCAL YEAR	DATE	ESTIMATED COST
BN HQ (M) (14183)				
COF (5) (14185)				
TEMF (L) (21410)				
OVP (85210)				
Others: Sidewalk, Utilities, Misc				
MPF Battalion				\$70.5

f. The MILCON projects listed above are mission critical to the completion of the force structure actions in this package. The MILCON projects listed above will compete in the Real Property Planning Board (RPPB) at the installation/IMCOM/FORSCOM and HQDA level. Any future MILCON will be subject to environmental consideration prior to construction.

10. Training land requirements. (From AR 5-10: Describe what new or diverted land requirements (e.g., configuration, capacity, and characteristics) will be needed to support unit training if the proposed action is approved. Identify whether changes to training land use will increase or decrease utilization intensity and any potential costs associated with sustaining the land (e.g., rehabilitation or rejuvenation). Identify all MILCON projects by fiscal year that would be canceled to mitigate any existing training land availability shortfalls. Describe the current status of the installation land use requirements study (LURS) according to AR 210-21 and AR 405-10 to support the proposed action.)

11. Environmental impacts. A categorical exclusion, documented in the Record of Environmental Consideration, was applied to this action. After a review of the Programmatic Environmental Assessment, the Army has concluded that no significant adverse environmental or socioeconomic impacts are anticipated to occur in conjunction with the implementation of the proposed action. As a result, no formal analysis is required under the National Environmental Policy Act.

a. The Programmatic Environmental Assessment (PEA) for Army 2020 Force Structure Realignment, dated January 2013 was completed to consider environmental effects to the Army's installations and training lands that could result from implementation of the proposed action to realign Army forces from fiscal year (FY) 2013 through FY 2020. The PEA presents an over-arching perspective that provides decision makers, as well as regulatory agencies and the public, with information on these

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

potential impacts, enabling them to assess and compare those impacts. No significant environmental impacts are anticipated to occur in conjunction with the implementation of the Proposed Action.

b. In accordance with 32 Code of Federal Regulations (CFR) Part 651, the proposed activation has been reviewed for potential environmental impacts. It is determined that this action is categorically excluded under the provisions of 32 CFR 651, Appendix B, Section II as described below:

1) CX (b) (12): Reductions and realignments of civilian and/or military personnel that: fall below the thresholds for reportable actions as prescribed by statute (10 U.S.C. 2687) and do not involve related activities such as construction, renovation, or demolition activities that would otherwise require an EA or an EIS to implement (REC required). This includes reorganizations and reassignments with no changes in force structure, unit re-designations, and routine administrative reorganizations and consolidations (REC required).

~~2) CX (c) (1): Construction and demolition: Construction of an addition to an existing structure or new construction on a previously undisturbed site if the area to be disturbed has no more than 5.0 cumulative acres of new surface disturbance. This does not include construction of facilities for the transportation, distribution, use, storage, treatment, and disposal of solid waste, medical waste, and hazardous waste (REC required).~~

c. Any future MILCON will be subject to environmental consideration prior to construction.

d. ~~Attached is a copy of the Record of Environmental Consideration (REC) for AR 5-10 Stationing Package FY25-1 for the activation of Mobile Protective Firepower Battalion at Fort Bragg, NC, as required by 32 CFR Part 651 and the National Environmental Policy Act (NEPA) as implemented through regulations promulgated by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508).~~

12. Quality of Life (QOL) Requirements. *(From AR 5-10: Describe any extraordinary well-being requirements considered at the gaining installation (e.g., accommodating large numbers of newly arrived families, which may include exceptional family members and/or pets, and disseminating the many household goods shipments). Identify any required initiatives that must be taken to ensure adequate well-being for all personnel.)*

a. *The current capacity in Child Development Centers (CDC) and School Age Centers (SAC) do not meet the requirement for the existing population. The shortage has been compounded by COVID-19 which has increased the wait lists substantially. New MILCON projected CDCs to support the current population are programmed to start construction in FYxx and FYxx. There are no programmed projects to increase the capacity for the SACs for the current population.*

b. *Physical Fitness Centers (PFC) are also under a current constraint. xxx has 135,057SF fitness space with a current shortage of 111,760SF, which will increase slightly based on the projected population in FYxx to 135,290SF shortage of fitness space. Courses of Action to accommodate this shortage are being reviewed by the Directorate of Family, Morale, Welfare and Recreation (DFMWR).*

c. *Current Army Family Housing will be able to accommodate the additional estimated families requiring housing on the installation including the general officer's quarters. This proposed stationing action will increase the child care requirements at Fort xxx by an estimated 11 children for Child*

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

Development Care (CDC) and 9 for School Age Child Care slots at a total cost of \$81.9 K per year in tuition assistance.

d. Projected statements of non-availability given to Soldiers will be included in the reoccurring annual cost estimate, as barracks space is limited due to ongoing upgrades and updates to aging and out of standard barracks buildings.

School Aged Child Calculator for Stationing table.

MPF BN	# Soldiers	# of Kids Aged 0-5	# of Kids Aged 6-11	# of Kids who need CDC Services	Cost Per Kid for CDCs	Cost per Kid for SACC	# of Kids who Need SACC	Cost per Kid for Tuition Fee Assistance (Aged 0-5)	Cost per Kid for Tuition Fee Assistance (Aged 6-11)	CDC OpEx	Tuition OpEx (Aged 0-5)	SACC OpEx	Tuition OpEx (Aged 6-11)
Number of Officers	35	15.02421	10.900727	3.756052542	\$11.357.00	\$5,678.50	2.7251817	\$5,110.00	\$2,555.00	\$42,657.49	\$19,193.43	\$15,474.94	\$6,962.84
Number of Warrant Officers	1	0.3923457	0.2035107	0.09808642	\$11.357.00	\$5,678.50	0.050877667	\$5,110.00	\$2,555.00	\$1,113.97	\$501.22	\$556.98	\$129.99
Number of Enlisted	354	136.38862	151.15616	34.09715512	\$11.357.00	\$5,678.50	37.78904003	\$5,110.00	\$2,555.00	\$387,241.39	\$174,236.46	\$193,620.70	\$96,551.00
TOTALS	390	152	162	38			41			\$431,012.85	\$193,931.11	\$209,652.62	\$103,643.83

13. Coordination of funding.

- a. Fort Bragg Garrison POC: Ms. Torsha Putzke
Office: DRM
Phone Number: (910) 432-0926, DSN: 239-0926
Email Address: torsha.a.putzke.civ@army.mil
- b. Fort Bragg Logistics Readiness Center (LRC) POC: Mr. Robert Fleming
Office: DPW Master Planning
Phone Number: (910) 432-4300
Email Address: robert.a.fleming1.civ@army.mil
- c. FORSCOM POC: Mr. David Culbreth
Office: FORSCOM G-8 Budget
Phone Number: 910-570-6831
Email Address: david.b.culbreth.civ@army.mil

14. Impact on Reserve Component training and support. *(From AR 5-10: Describe the impact on training areas, ranges, readiness, annual training facilities, and unit training affiliations.)*

15. Potential problems. *(From AR 5-10: Identify potential problems, such as local opposition or socioeconomic concerns, which may be encountered if the action is implemented. Describe the impact upon the installation if the proposed stationing action is approved. For example, if a U.S. Army Forces Command (FORSCOM) medical battalion is inactivating, what is the impact to the local MEDCOM activity that may rely on the battalion's medical personnel to augment its staff.)* Discuss these potential problems and their mitigation strategies in other relevant paragraphs.

Example: Insufficient on-post child care capacity at Fort Gordon is a known problem exacerbated by this stationing action, especially if the Army elects not to invest in the CDC expansion as requested by the installation. Even if proposed investments are made, successfully staffing larger CDCs is not automatic because the child care marketplace off-post is also very constrained and cannot be relied upon in the short-term to make up for on-post shortfalls. Tuition fee assistance expenses at Fort Gordon are likely to increase and must be accounted for, else Soldiers Families will face longer wait lists and higher out-of-pocket expenses.

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

16. Milestones. The e-date is the documentation date for the action. 6 months prior to the e-date personnel and equipment will start to be assigned at the installation. Initial Operational Capabilities (IOC) for activations will be 6 months after the e-date with Full Operational Capabilities (FOC) being 12-18 months after the e-date. The standard for activations is 70% personnel and equipment at e-date. These milestones are subject to personnel and equipment availability from the Army. The estimated initial operational capability for the MPF Battalion is 16 April 2024 and expected full operational capability is expected by 16 Oct 2025.

month	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10	+11	+12
Activation		PO published Carrier UIC						Personnel & Equipment					EdDate						IOC - begin collective						FOC - evaluated training event

UNIT	UIC	EDATE
MOBILE PROTECTIVE FIREPOWER (MPF) BATTALION	X17	16-Oct-24

Example of MPF Fielding Plan: Please insert any tables specific to the MPF Battalion at Fort Bragg.

Timeline		FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35				
MPF Timeline	NET / SVA / LUT at Fort Bragg (3/82 ABN)	Milestone C Decision	LRIP Award #1	LRIP Award #2	IOT&E	FRP FUE	IOC									FOC				
						1x IBCT (14 vehicles)	TRADOC 2x IBCTs (42 vehicles)	4x IBCTs (56 vehicles)	3x IBCTs (42 vehicles)	4x IBCTs (56 vehicles)	3x IBCTs (42 vehicles)	4x IBCTs (56 vehicles)	3x IBCTs (42 vehicles)	4x IBCTs (56 vehicles)	3x IBCTs (42 vehicles)	4x IBCTs (56 vehicles)				
Environmental compliance studies IAW NEPA											08 APR 20 ASM decision						FY21-23 ASM decision			

FDU	FY21	FY22	FY23	FY24	4QFY25 (FUE)	FY26	FY27	FY28	FY29
MPF BN/CO		MPF BN FDU MPF CO FDU							APS 2 and 5
LDCS		LDCS pilot FDU							
ADCS		ADCS pilot FDU							
FSE	-Pending DIV CAV Fire Support Element FDU at CAC review board								
Quantity of MPFs					14	+42=56	+56=112	+42=154	+56=210 294 MPFs remaining to field through FY35

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

MANPOWER MIGRATION DIAGRAM
Fort Bragg FY25-1

Authorization changes.

FY25

UNIT	UIC	SRC	EDATE	FY	ACTION	STATION	AUTH OFF	AUTH WOF	AUTH ENL	AUTH MIL	AUTH CIV	NON ADD	IN/OUT MIL	IN/OUT CIV
MPF BATTALION	X17	17245K000100	16-Oct-24	25	Activation	FT BRAGG	35	1	354	390			390	
													Total Military	390
													Total Civilian	0
													Total	390

DRAFT

AR 5-10 Stationing Summary FY25-1 Force Structure Actions at Fort Bragg

POPULATION CHANGES
Fort Bragg FY25-1

The Army Stationing and Installation Plan (ASIP) database is the source for baseline strengths. ASIP Data: 2022-2028 data based on FY22 SAMAS Extract 16 December 2021. The populations documented in the before "Total Military" and "Total Civilian" text boxes are drawn from the ASIP Common Operation Picture (COP) tables. The tables below only reflect the force structure changes in this stationing package to FORSCOM units at the installation.

FY25

Fort Bragg	TOT MIL	TOT CIV
BEFORE	47,280	16,492
TRANSFERRING OUT	0	0
TRANSFERRING IN	390	0
AFTER	47,670	16,492

DEPENDENT POPULATION CHANGES (SCHOOL AGED CHILDREN AND FAMILY MEMBERS)

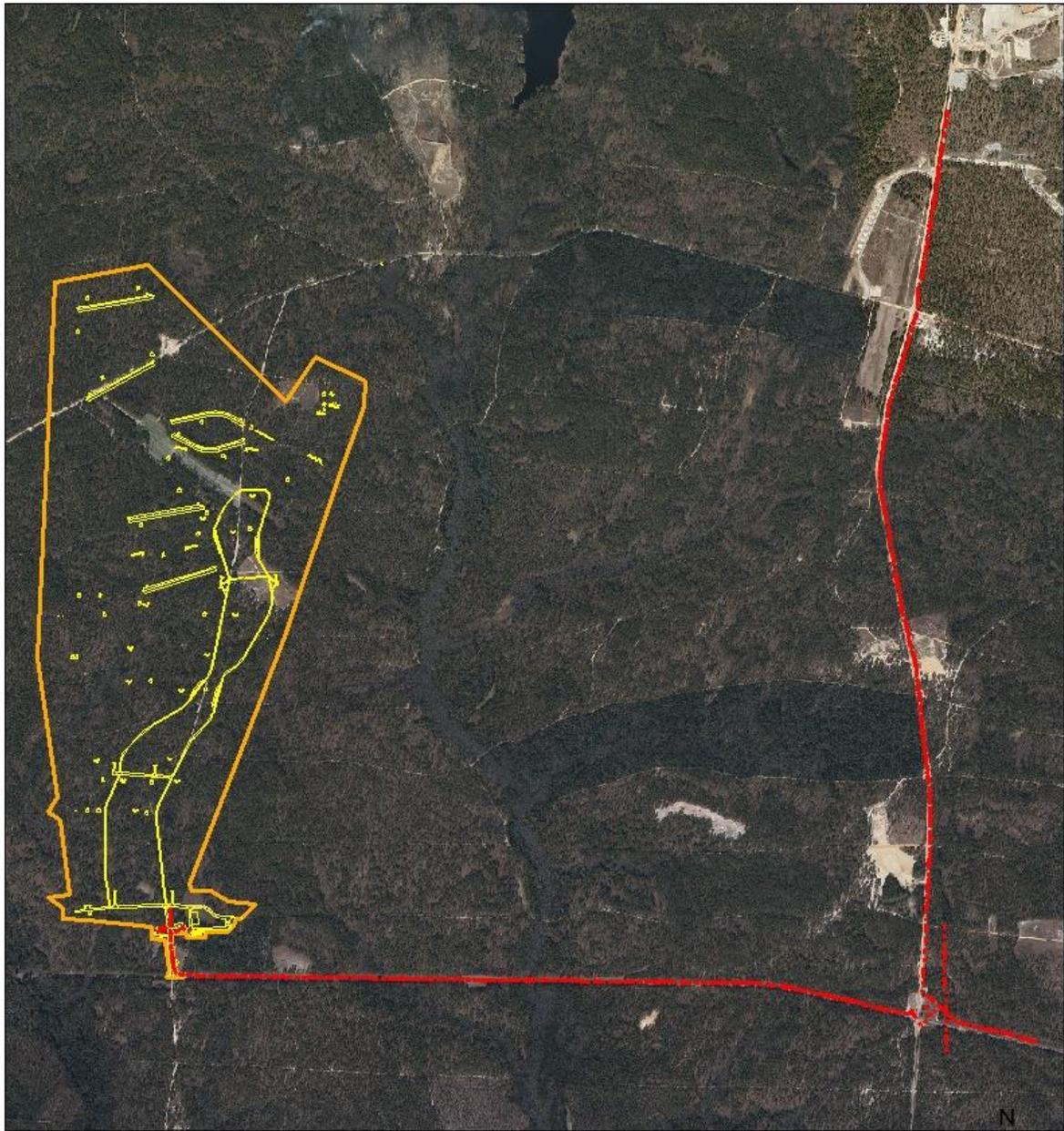
FY2025

Net Population Change in Military	390
Net Population Change in DOD Civilians	0
Total Population Change in Military and Civilian	390
School Aged Children Formula = (Total Change in Military and DOD Civilian 390 x 0.484)	
Military Family Member Formula = (Total Military 390 x 1.52)	
Estimated Increase in School Aged Children of Military and DOD Civilians	189
Estimated Increase in Military Family Members	593

COST AND COST SAVINGS SUMMARY (\$ THOUSANDS)
Fort Bragg FY25-1

One-Time Costs (\$K)					Source of Funds
	FY24	FY25	FY26	FY27	
Military Personnel Appn Costs					
Military PCS					
Operations and Maintenance Costs					
Civilian Personnel Costs					
Civilian PCS					
Civilian Termination Costs					
Equipment Transportation					
Facility Modification					
Equipment Purchases (<\$250K Threshold>)					
Procurement Appns Costs					
Military Construction Appn Costs					
Facility Modification					
New Facilities (MILCON)					
New Family Housing privatized housing					
Logistics Readiness Center (LRC) Costs					
Total One-Time Costs					
Annual Recurring Costs (\$K)					Source of Funds
	FY24	FY25	FY26	FY27	
Current Location					
Mission (-)					
Civilian Pay					SAG 121 Mission
GS/NSPS					
Contractor					
Base Support (less civilian pay)					IMCOM OMA
BASOPS		877.5		\$1,147.51	SAG 131 (-)
Family Program					IMCOM OMA (Tuition Fee Assistance for ~xx children; increased CDC operations costs)
Environmental					
Audio Visual					IMCOM OMA
Base Communications					
Real Property Maintenance					IMCOM OMA
Total Recurring Costs					

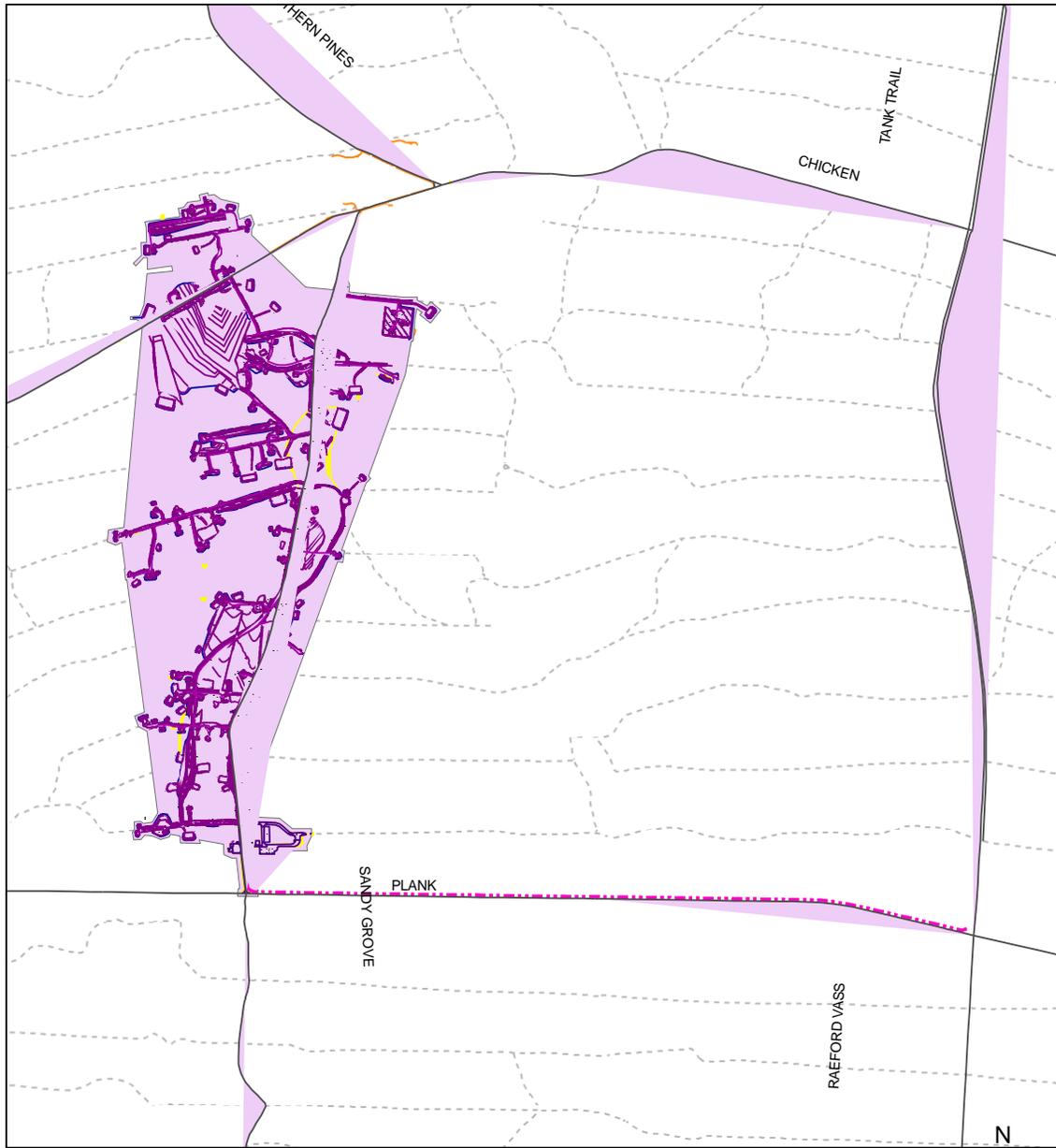
Inclusion C: Location of Preferred Alternative with Communication and Electric (35% Design)



Legend

- Electric and communication
- _35%_Layout_Rev01_MPF_05-12-21
- _35%_Layout_Rev01_no-MPF_05-12-21
- _35%_Clearing_Rev01_MPF_05-24-21

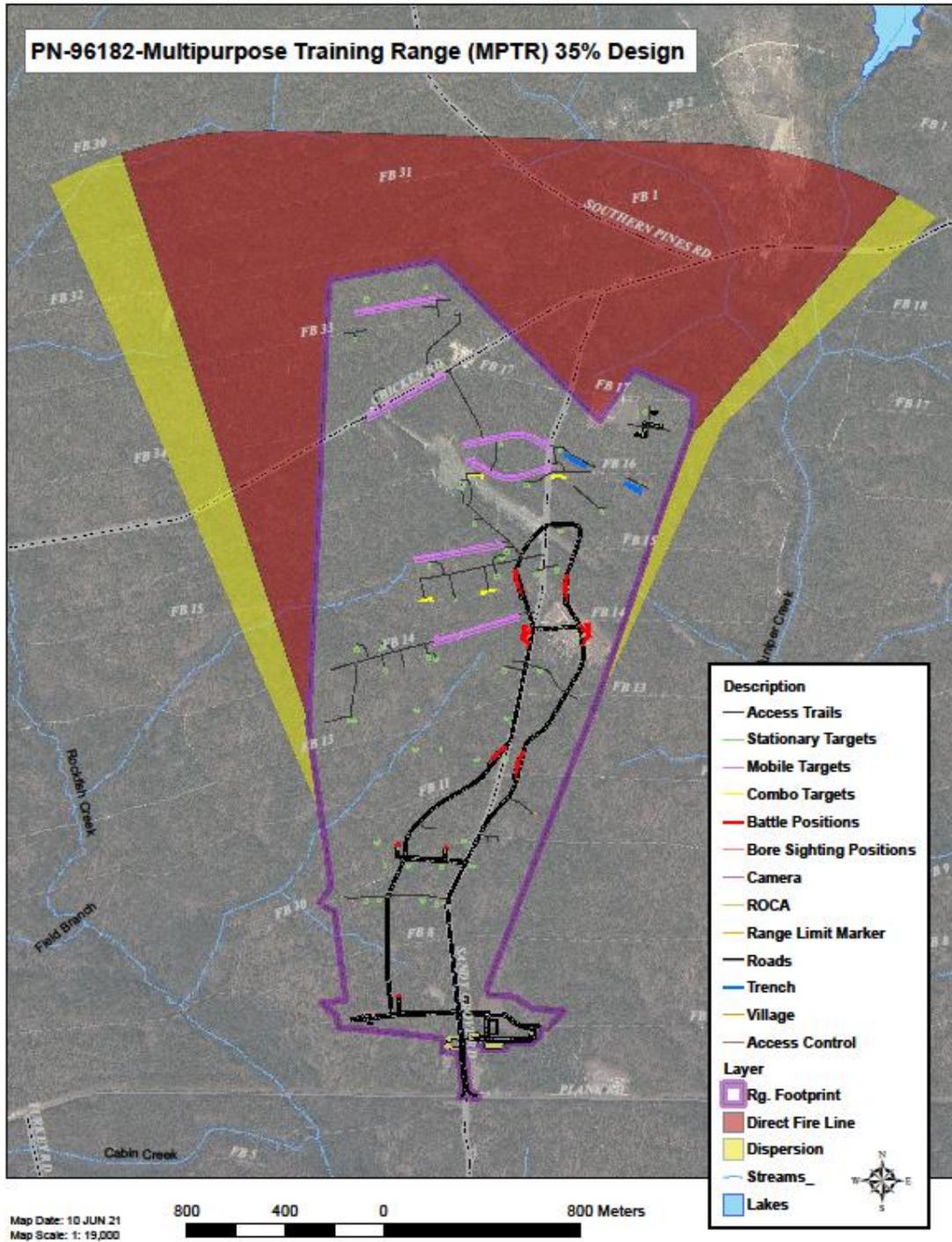
Location of Preferred Alternative with Communication and Electric (100% Design)



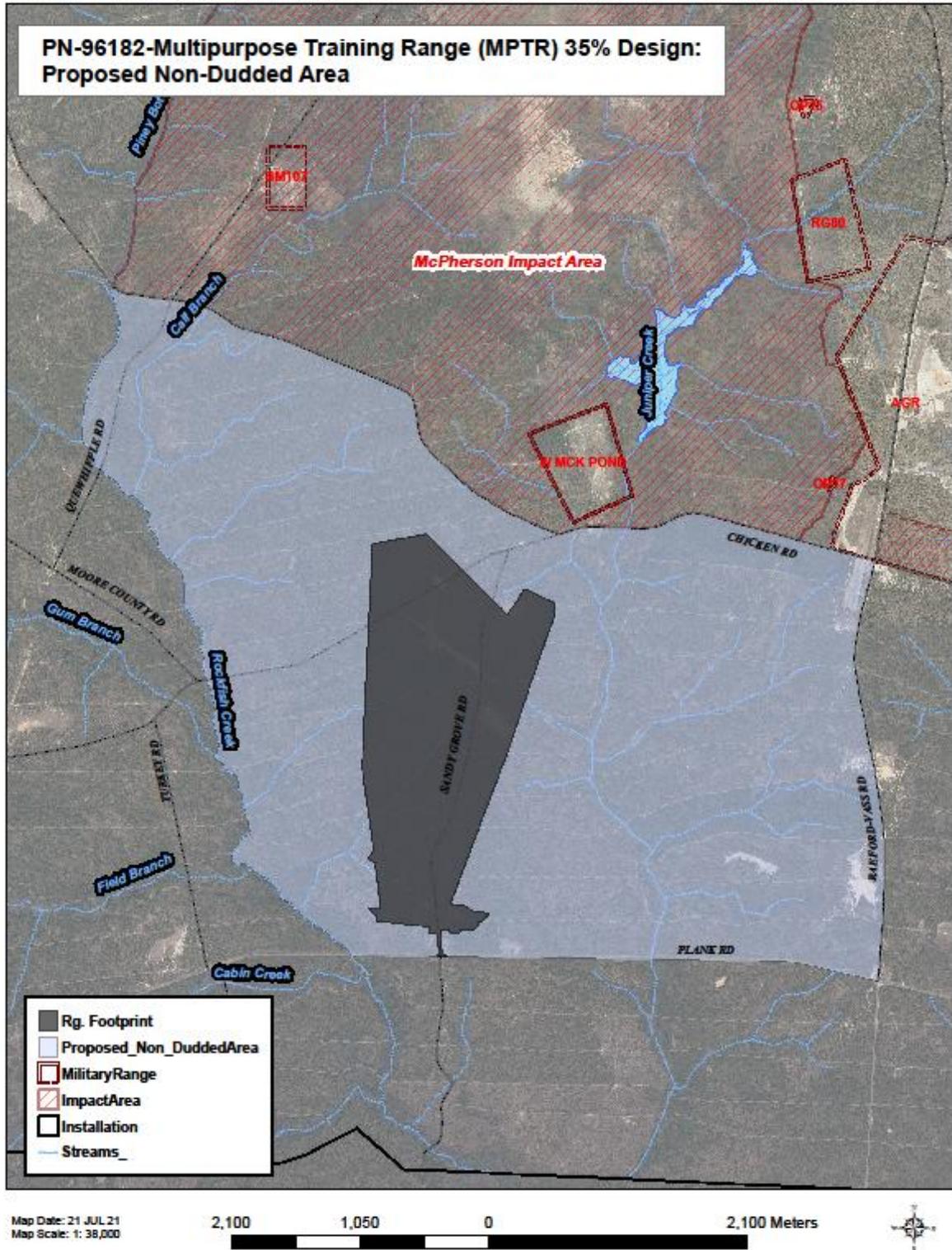
Legend

- RoadCenterline_1
- Bragg_MPTR_100sub_Elec_Comms_Downrange
- Bragg_MPTR_100sub_Grading_Downrange
- Bragg_MPTR_100sub_Layout
- Bragg_MPTR_100sub_Silt_Fence_Downrange
- CableRoute3
- 35%_Layout_Rev01_MPF_05-12-21
- Bragg_MPTR_100sub_Clearing_Downrange
- 35%_Layout_Rev01_no-MPF_05-12-21

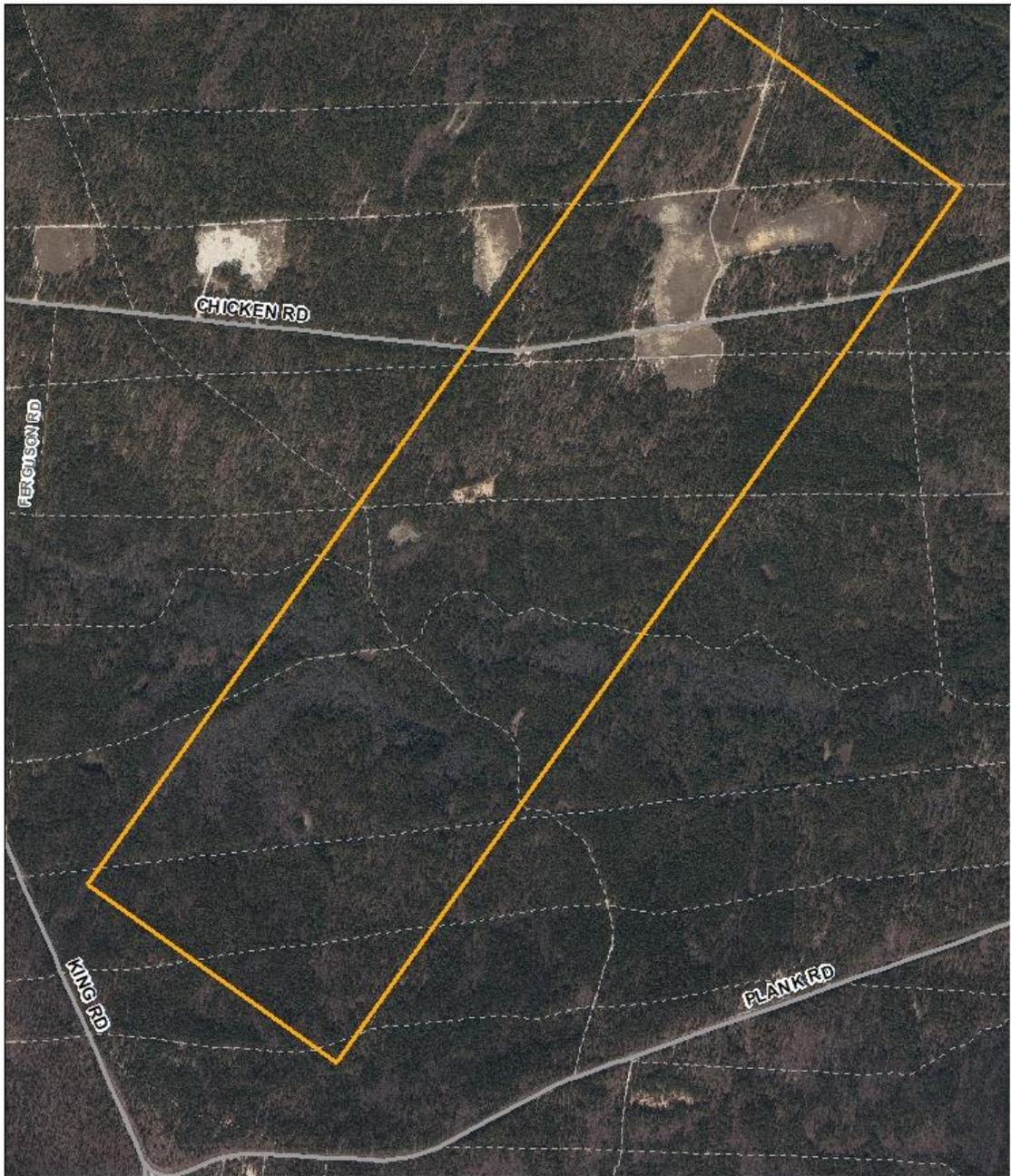
Inclusion D: MPTR Proper Preferred Alternative with SDZ



Inclusion E: MPTR Preferred Alternative and Alternative 3 Location with Non-Dudded Impact Boundary



Location of Alternatives 4-5 (Does not include SDZ)



Legend

 PL#2_MPTR_Footprint_2019



Inclusion G: Location of Alternatives 4-5 with Environmental Overlay (Does not include SDZ)



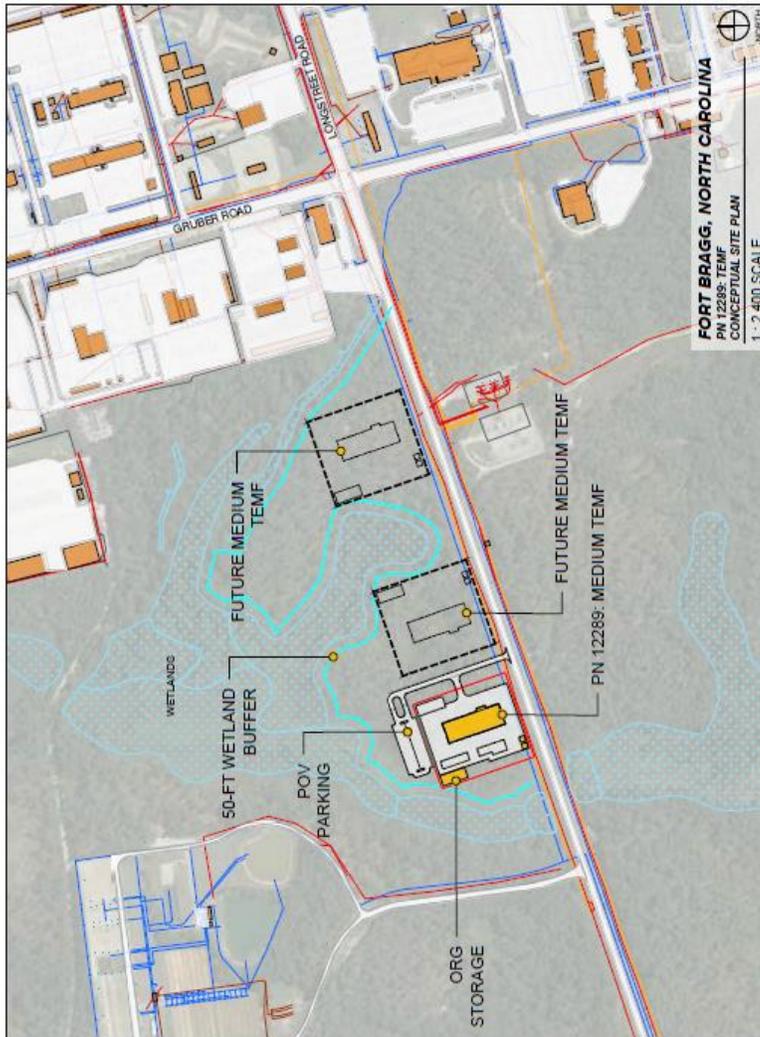
Legend

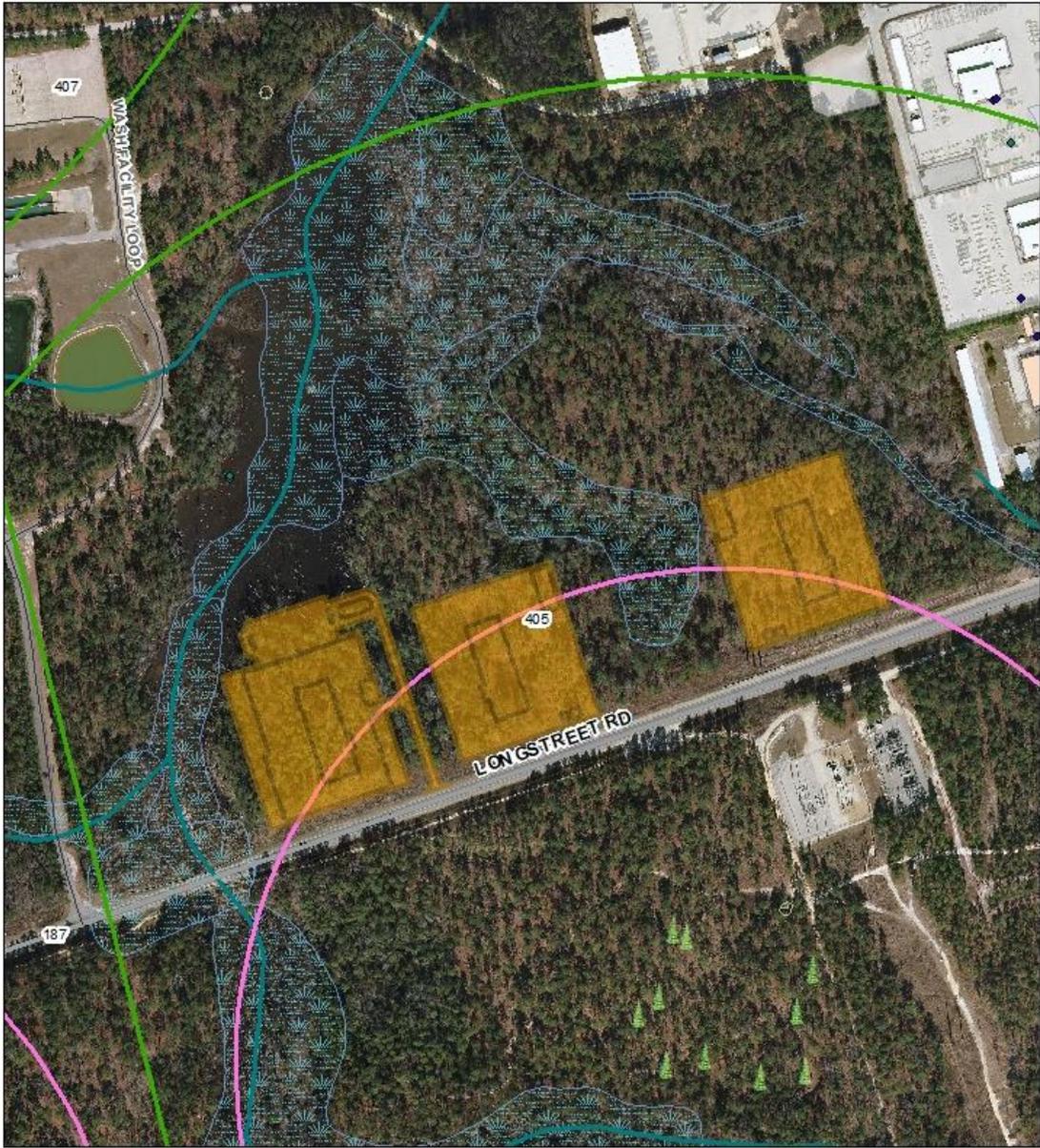
- PL#2_MPTR_Footprint_2019
- RCW_QUARTER_MILE_PARTITION
- RCW_HALF_MILE_PARTITION
- RCW_TREE
- Archaeological_Site
- Wetland
- Special_Status_Species_Flora



Inclusion H: Anticipated TEMF Construction

Preliminary Conceptual Site Plan





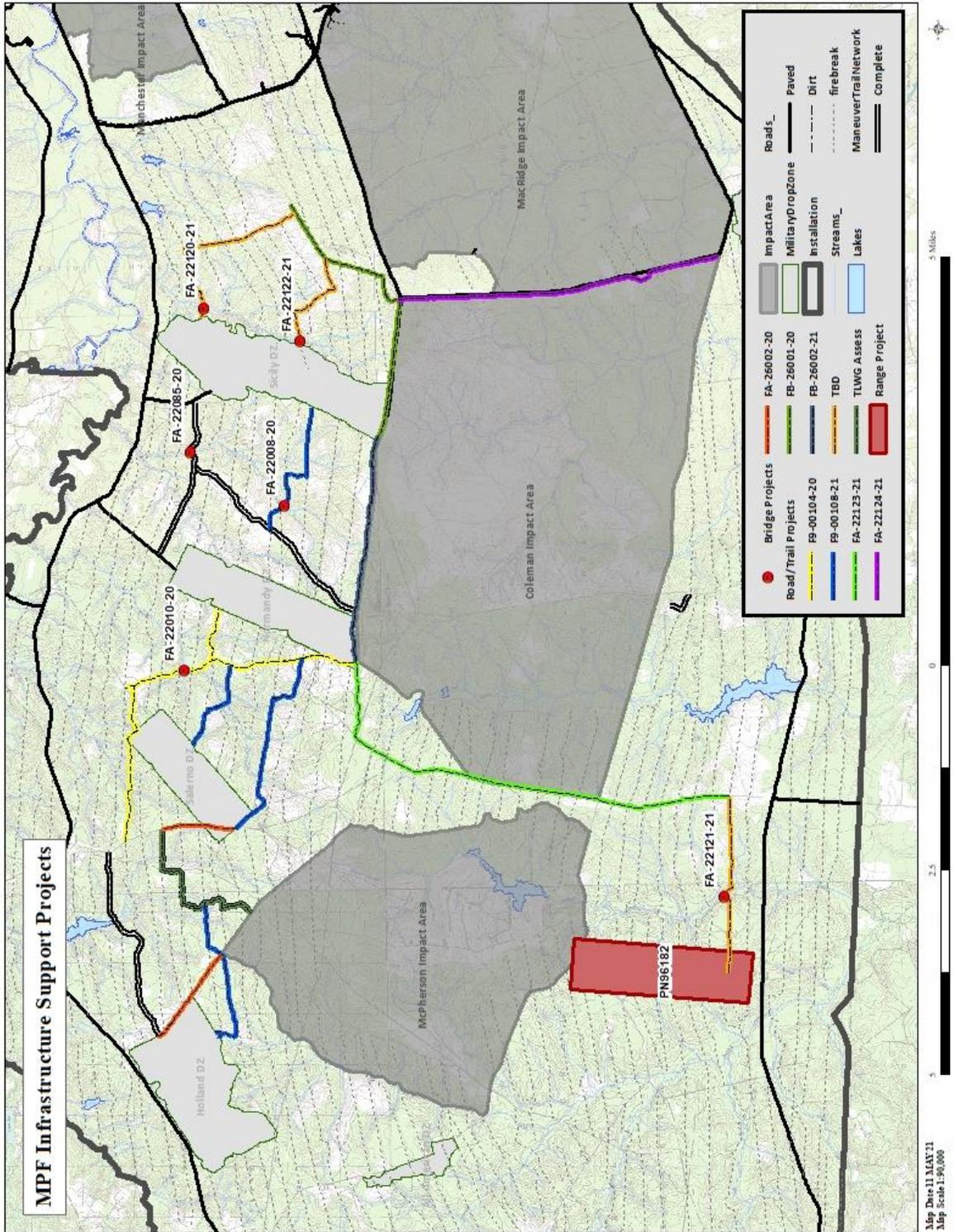
Legend

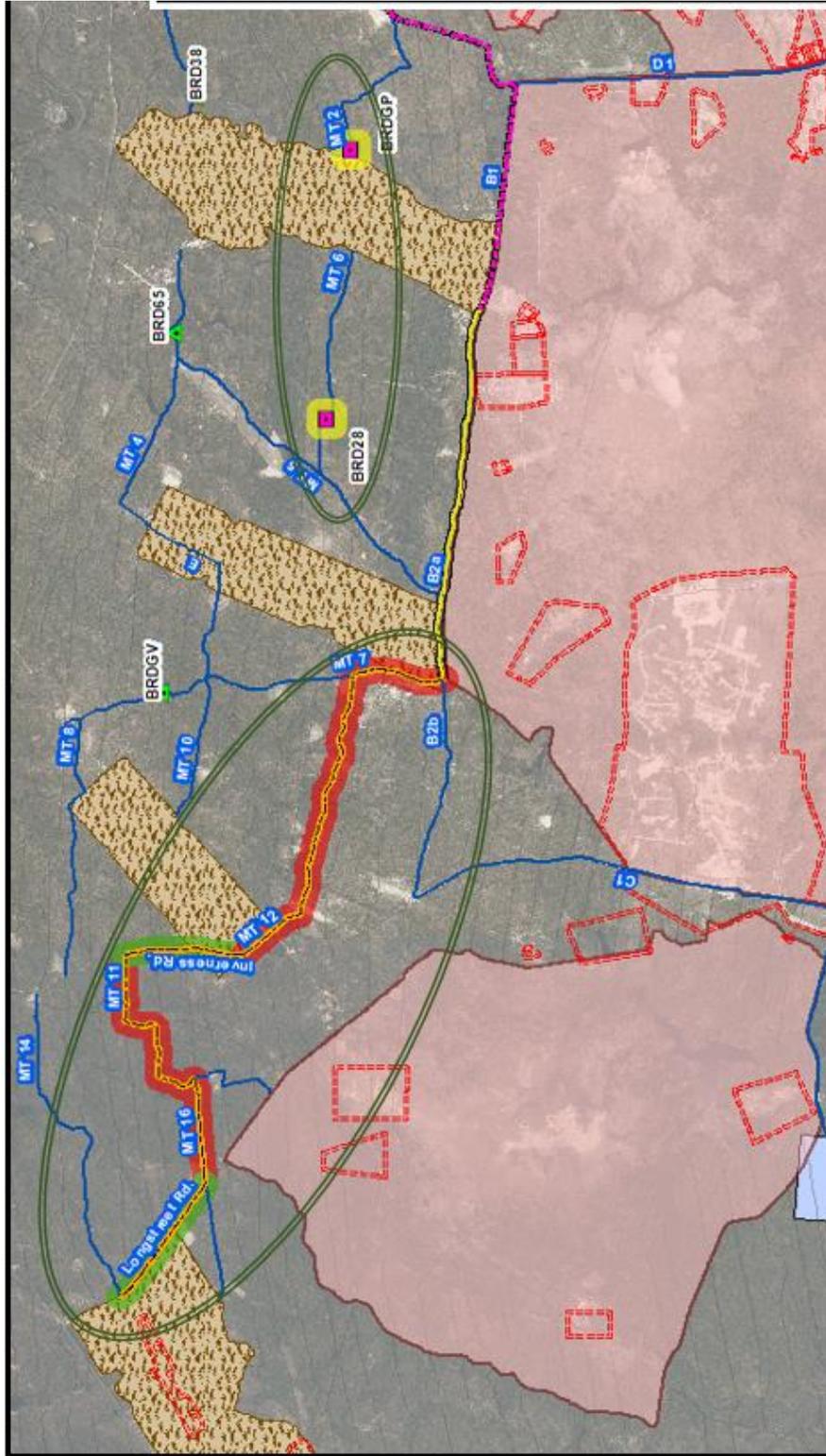
- TEMFs
- Wetland
- RCW_QUARTER_MILE_PARTITION
- RCW_HALF_MILE_PARTITION
- RCW_TREE

420 210 0 420 Feet

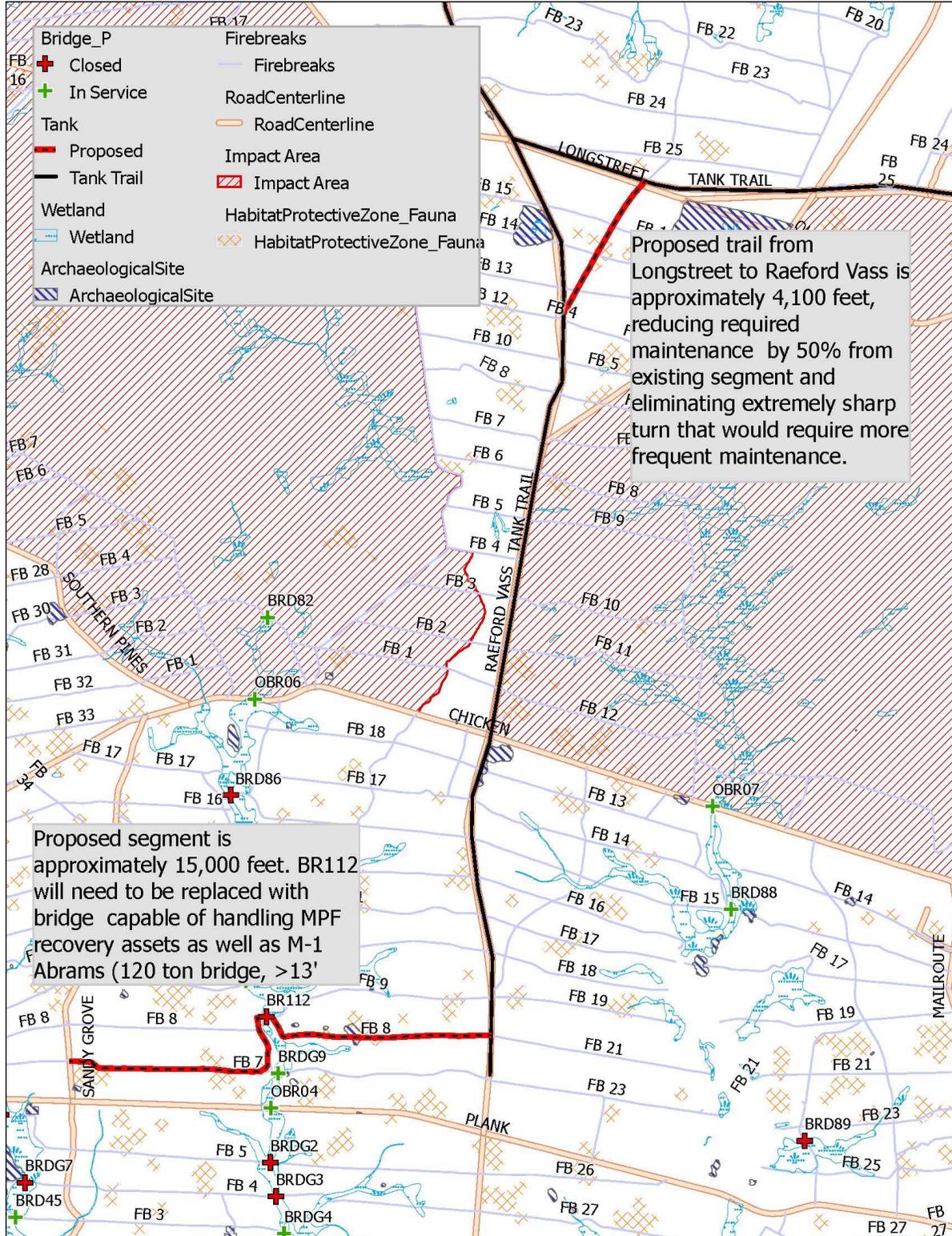


Inclusion I: Maneuver Trail Concept

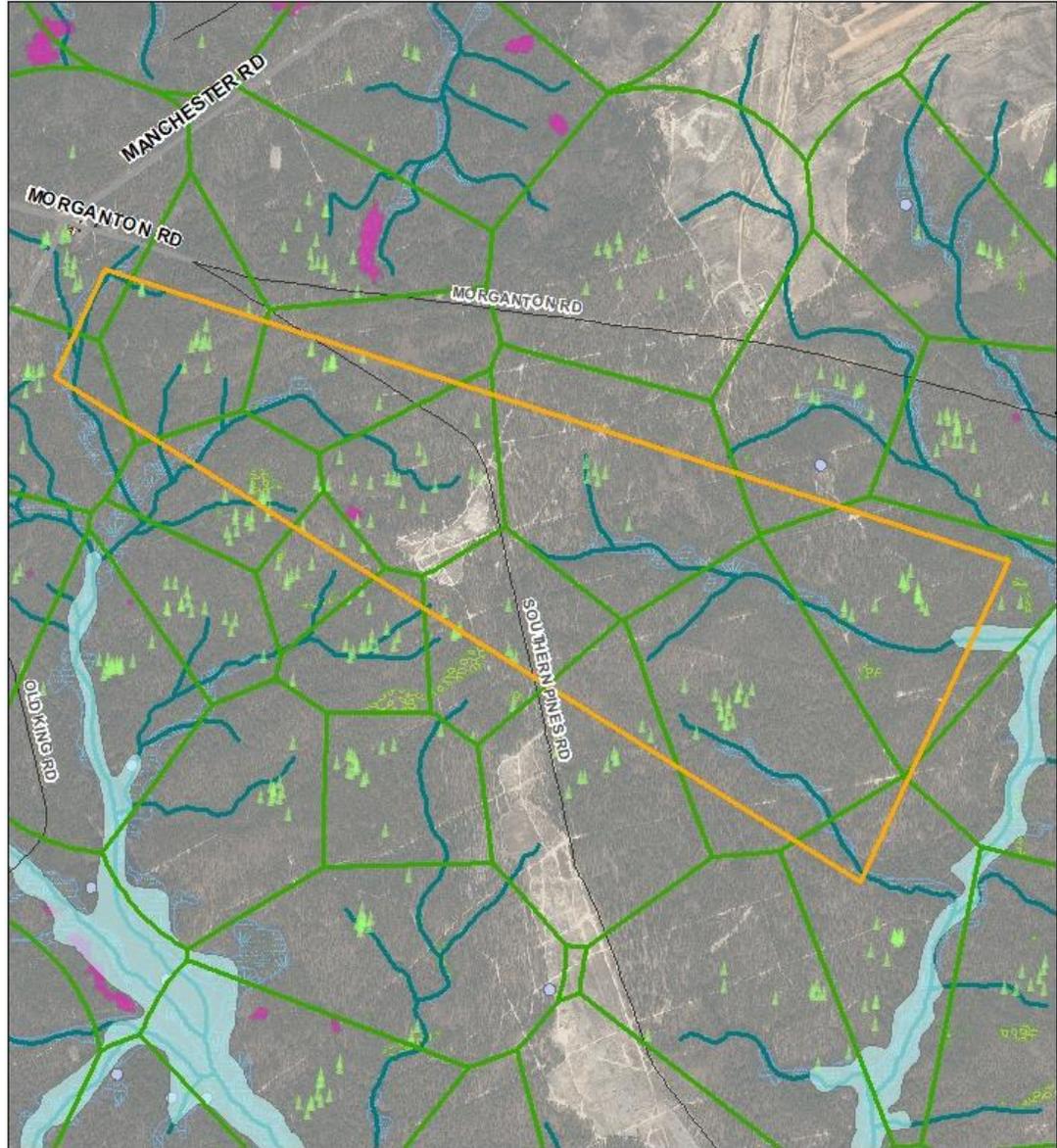




Inclusion K: Road Upgrade Map



Inclusion L: IPBC Location



2,000 1,000 0 2,000 Feet

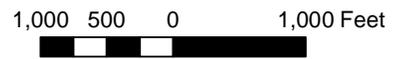
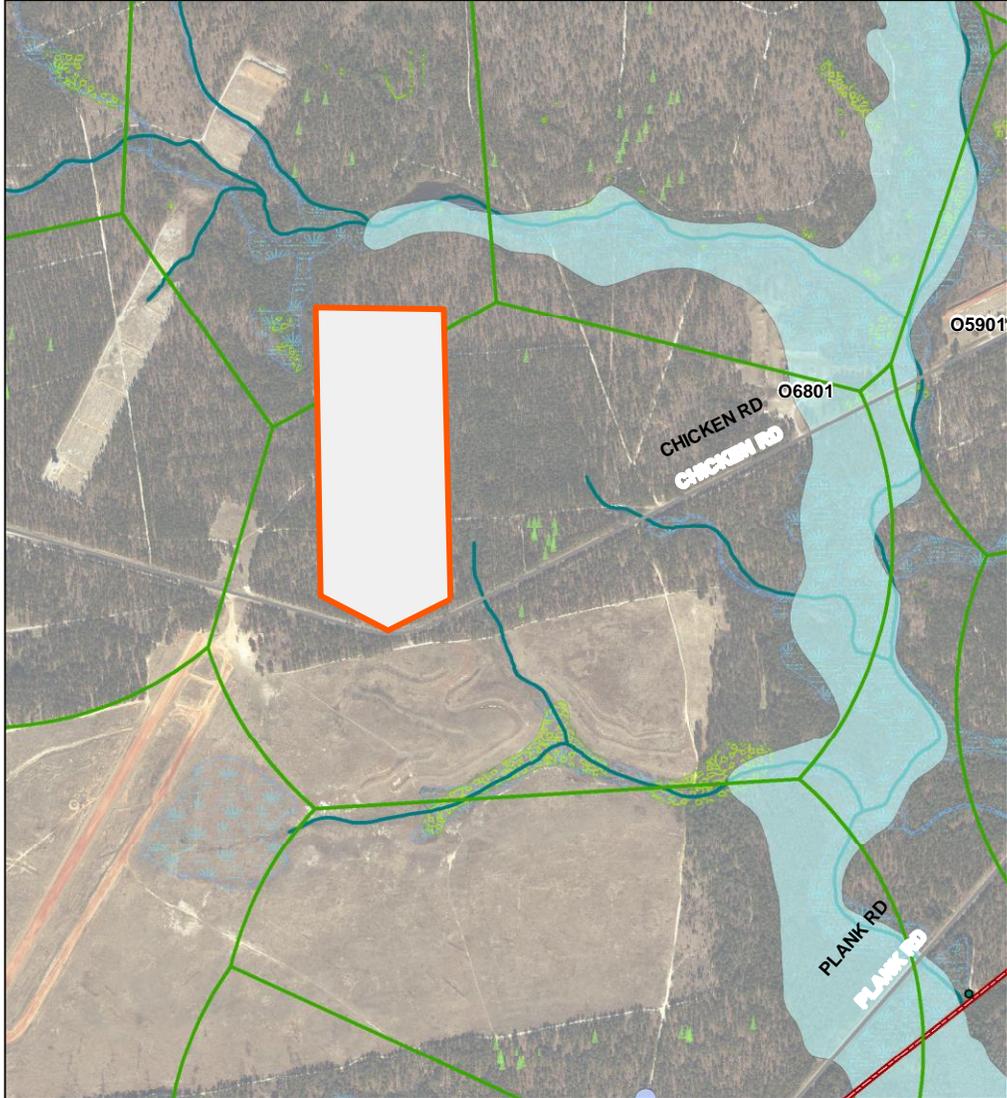


Legend

- | | |
|------------------------------|-------------------------|
| IPBC_Northwest_militaryRange | RCW_HALF_MILE_PARTITION |
| WaterFeature_L | RCW_TREE |
| Wetland | <all other values> |
| Inundation | ArchaeologicalSite |



Inclusion M: ARF +

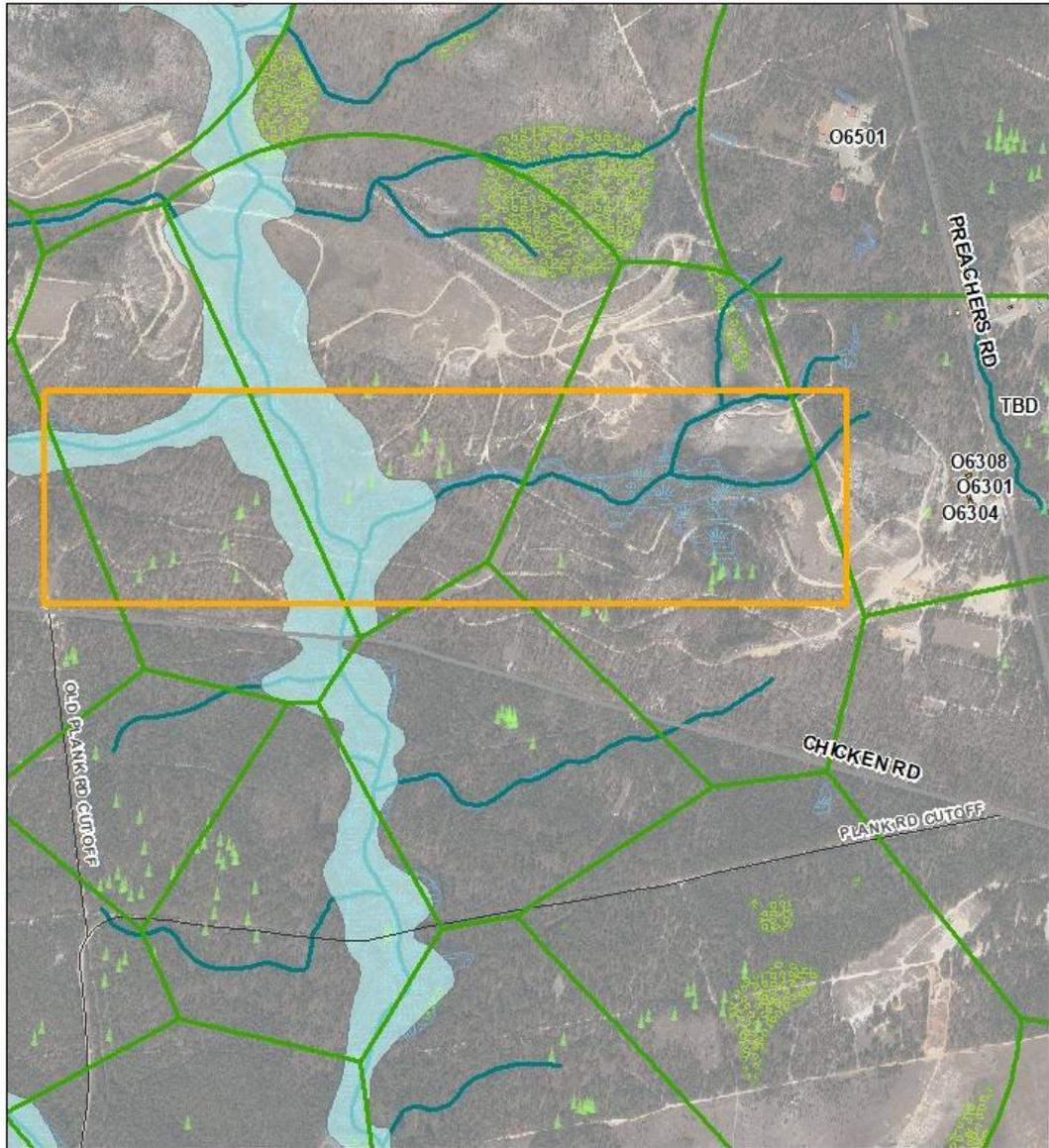


Legend

- WaterFeature_L
- Wetland
- Inundation
- ARF +
- RCW_HALF_MILE_PARTITION
- RCW_TREE
- <all other values>
- ArchaeologicalSite



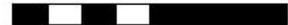
Inclusion N: Scout Range



Legend

-  WaterFeature_L
-  Wetland
-  Inundation
-  RCW_HALF_MILE_PARTITION
-  RCW_TREE
-  rare plants
-  Scout Range

1,100 550 0 1,100 Feet



Inclusion O: Resource Area Issues, Concerns, Risks

Resource Area	Action Alternatives	No Action Alternative
<p>Air Quality and Greenhouse Gas</p> <ul style="list-style-type: none"> • Conformity • NAAQS • PSD • New Source Review • Minor Source Preconstruction Permitting • Dust 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • There could be a wildland fire risk during training, however it is in an area adapted to fires. • Less trees to absorb greenhouse gases. • Minimal MPF release of GHG resulting in insignificant GHG social cost 	<ul style="list-style-type: none"> ❖ Level of Analysis: Very Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Airspace</p> <ul style="list-style-type: none"> • controlled airspace • SUAs • MOAs 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Cultural Resources</p> <ul style="list-style-type: none"> • historic buildings and structures • archaeological resources • SHPO consultation • Native American Tribes consultation • historic viewsheds 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • The project footprint is north of, but adjacent to, Sandy Grove Presbyterian Church and cemetery. Project location was shifted north during planning phase to avoid these resources. • Additional sites determined to be eligible or potentially eligible for listing in NHPR west of the proposed range construction footprint. • Ineligible site is located east of Raeford Vass Road adjacent to communication/electrical portion of the project. Utility installation will not affect site due to ineligibility. 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • There is a 6 acre footprint to protect the nearby Sandy Grove Presbyterian church (built in 1847) and cemetery. There is an engaged church community that uses the building.
<p>Land Use</p> <ul style="list-style-type: none"> • land use • real property management • easements • viewsheds not addressed under cultural resources 	<ul style="list-style-type: none"> ❖ Level of Analysis: Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • Noticeable change in with the proposed clear cutting of approximately 800 acres. • Proposed project occurs within existing training area 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Energy(Utilities)/Facilities</p> <ul style="list-style-type: none"> • potable water • drinking water plants 	<ul style="list-style-type: none"> ❖ Level of Analysis: Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • No water needed 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified

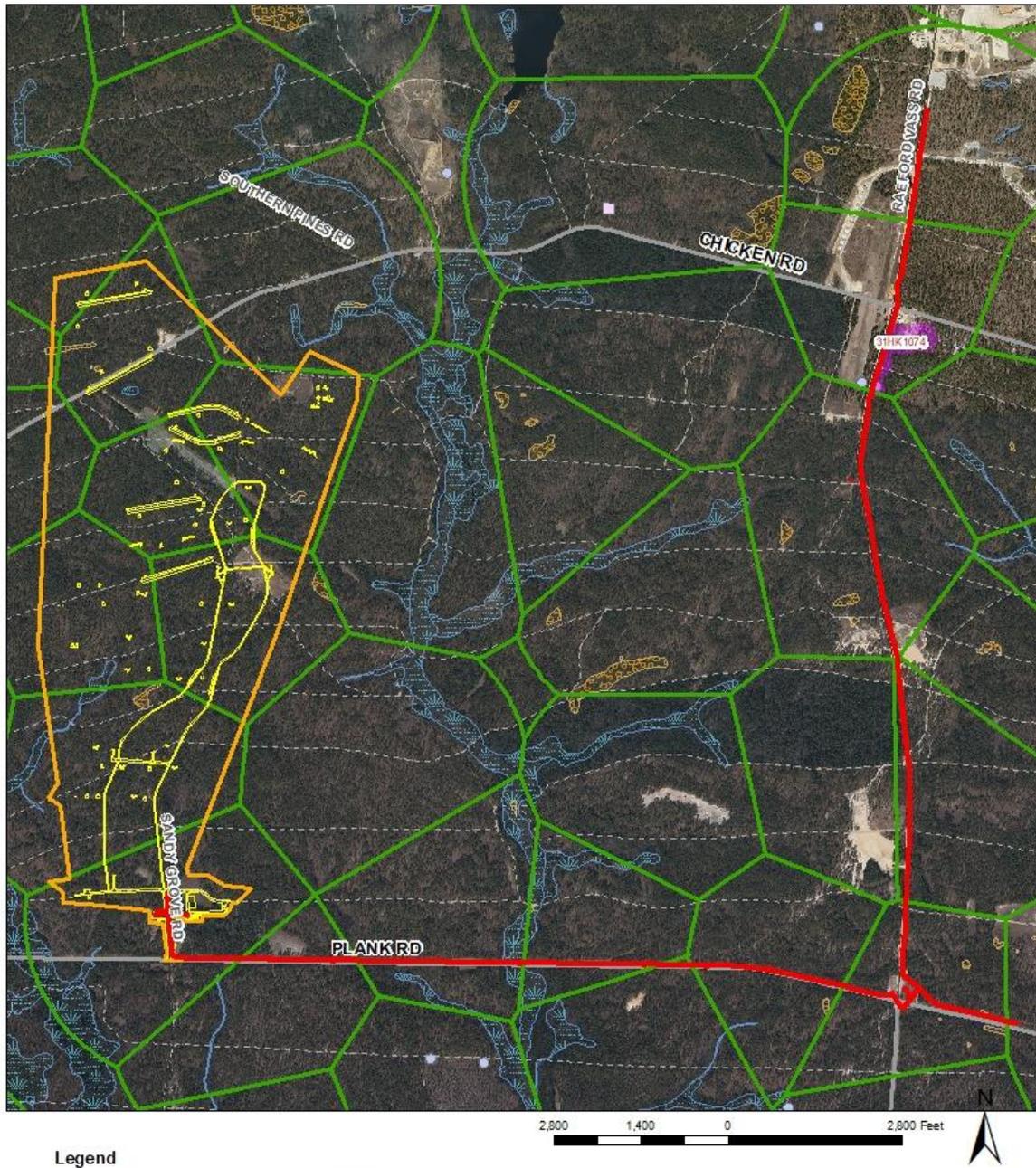
Resource Area	Action Alternatives	No Action Alternative
<ul style="list-style-type: none"> • wastewater • storm water • NPDES permitting • solid waste • energy • heating • cooling, • communications 	<ul style="list-style-type: none"> • To either use portable toilets or have a dry flush system • Power is approximately 13,000LF from the proposed site and requires an ETS as it exceeds the 10k feet limitation • 	
<p>Noise</p> <ul style="list-style-type: none"> • noise zones • noise impacts to community • noise impacts to wildlife • risks of noise complaints 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low or Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • Noise from weapons fire could be a concern to neighboring community and/or church goes. • The site is proximate to a historic church (Sandy Grove Presbyterian church) still used by the community. There may be an occasional risk of noise complaint. • Noise and vibration from the use of vehicles and live fire will likely disturb wildlife in the immediate and bordering area. 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low or Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Soil Erosion/ Water Resources Management</p> <p>bedrock properties</p> <ul style="list-style-type: none"> • seismology • economically viable minerals • soil series and properties • soil erosion potential 	<ul style="list-style-type: none"> ❖ Level of Analysis: Medium or High ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • Soil erosion from proposed clear cutting 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Solid Waste</p> <ul style="list-style-type: none"> • Construction and demolition landfill • Recyclable materials 	<ul style="list-style-type: none"> • Level of Analysis: Low <ul style="list-style-type: none"> • Forestry Branch will harvest all merchantable timber • Remaining vegetative debris will be hauled off site 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Socioeconomics</p> <ul style="list-style-type: none"> • demographics • housing • economic development • quality of life • environmental justice in minority and low-income populations 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified; project occurs in the Fort Bragg training area 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified

Resource Area	Action Alternatives	No Action Alternative
<ul style="list-style-type: none"> • protection of children from environmental health risks and safety risks 		
<p>Threatened and Endangered Species and Other Biological Resources</p> <ul style="list-style-type: none"> • vegetation • wildlife • threatened and endangered species • invasive species • wildland fires 	<ul style="list-style-type: none"> ❖ Level of Analysis: High ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • Red-cockaded Woodpecker (RCW, <i>Dryobates borealis</i>) present. Range construction and operation would result in incidental take of 11 RCW PBGs, 40 individual RCWs directly affected by the proposed action and 20 RCWs indirectly impacted. Indirect effects include removing of foraging activity; territory conflicts from displaced birds; disturbance from noise and vibration. Approximately 450 RCW PBGs would remain post project which is above the goal of 350 PBGs. This “adverse affect” determination requires formal consultation with the USFWS. • Other T&E species potentially present or nearby include:¹ <ul style="list-style-type: none"> ○ Endangered Saint Francis’ Satyr butterfly (<i>Neonympha mitchellii</i>) - not be present, therefore, “not likely to adversely affect”. ○ Endangered Michaux’s sumac (<i>Rhus michauxii</i>) - not be present, therefore, “not likely to adversely affect”. ○ Endangered Rough-leaf loosestrife (<i>Lysimachia asperulaefolia</i>) - not be present, therefore, “not likely to adversely affect”. ○ American chaffseed (<i>Schwalbea Americana</i>) – Range construction 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • RCW clusters present • Other T&E species potentially present or nearby

Resource Area	Action Alternatives	No Action Alternative
	designated within site SCA023. Site would be marked in the field; grading and grubbing would not occur within the site.	
<p>Transportation and Traffic</p> <ul style="list-style-type: none"> • traffic • roadways • rail transportation • air transportation • traffic volume • level of congestion 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low or Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • Minimal increase in traffic during construction • End users already work at Fort Bragg and would use existing infrastructure. 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Wetlands and Floodplain Management</p> <ul style="list-style-type: none"> • surface water • groundwater • floodplains • wetlands • 404 permits 	<ul style="list-style-type: none"> ❖ Level of Analysis: Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • Impacts to water quality due to anticipated erosion and runoff • Wetland delineation required and executed • Wetlands will not be impacted by utility lines will be directionally bored north of Plank Road under Juniper Creek and associated wetlands thereby precluding the need for wetland permitting. Approximately 0.3 acre of isolated wetland will be graded and filled. Approximately 8.8 acres of forested wetlands will be converted to non-forested wetlands due to tree removal. Both wetland areas are associated with Rockfish Creek Construction within both areas are not permitted by the USACE and do not require mitigation. 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low to Medium ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • None identified
<p>Hazardous and Toxic Materials and Waste</p> <ul style="list-style-type: none"> • hazardous material • hazardous waste • USTs/ASTs • asbestos • radon • LBP • PCBs • UXOs 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • The proposed project area occurs within the training area of an active military installation • The range will be non-dudged • UXO staff will be provided during construction 	<ul style="list-style-type: none"> ❖ Level of Analysis: Low ❖ Issues/concerns/risks: <ul style="list-style-type: none"> • The location is within the training area of an active military installation

Resource Area	Action Alternatives	No Action Alternative
<ul style="list-style-type: none">• MECs• POLs• EPCRA		

Inclusion P: Location of Preferred Alternative with Environmental Layers

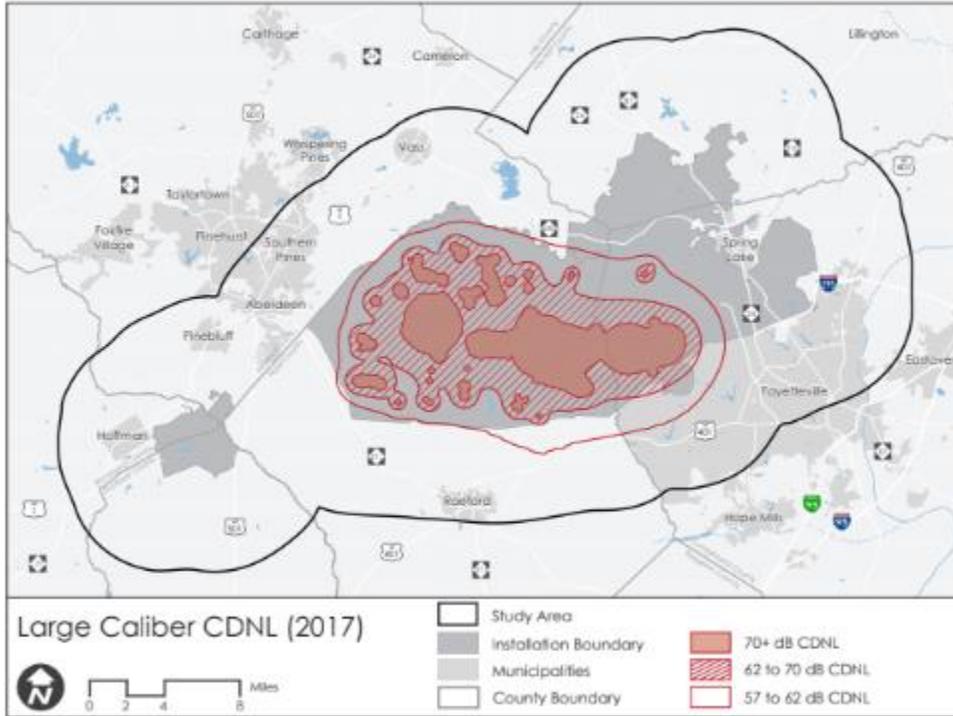


- Legend**
- Electric and Communication Utilities
 - _35%_Layout_Re v01_MPF_05-12-21
 - _35%_Layout_Re v01_no-MPF_05-12-21
 - _35%_Clearing_Re v01_MPF_05-24-21
 - RCW_HALF_MILE_PARTITION
 - Archaeological Site
 - Rare Flora
 - Wetland

Inclusion Q: Noise Map

LAND USE COMPATIBILITY FACTORS

MAP 6.2 NOISE ZONES: 2017 LARGE CALIBER WEAPONS CDNL



6.6 | FORT BRAGG JOINT LAND USE STUDY

Inclusion R: Environmental Justice



EJSCREEN Report (Version 2020)



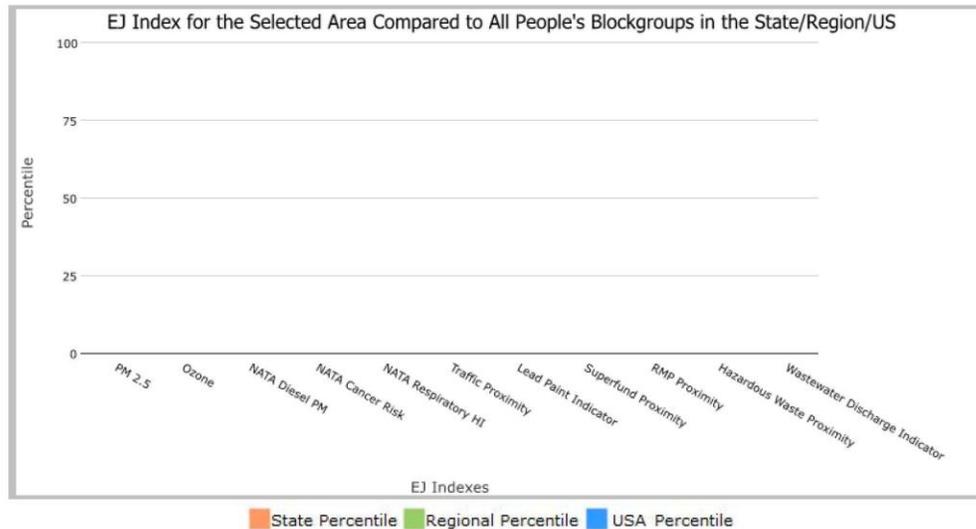
the User Specified Area, NORTH CAROLINA, EPA Region 4

Approximate Population: 0

Input Area (sq. miles): 2.47

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	N/A	N/A	N/A
EJ Index for NATA* Air Toxics Cancer Risk	N/A	N/A	N/A
EJ Index for NATA* Respiratory Hazard Index	N/A	N/A	N/A
EJ Index for Traffic Proximity and Volume	N/A	N/A	N/A
EJ Index for Lead Paint Indicator	N/A	N/A	N/A
EJ Index for Superfund Proximity	N/A	N/A	N/A
EJ Index for RMP Proximity	N/A	N/A	N/A
EJ Index for Hazardous Waste Proximity	N/A	N/A	N/A
EJ Index for Wastewater Discharge Indicator	N/A	N/A	N/A



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

April 20, 2021

1/3



EJSCREEN Report (Version 2020)

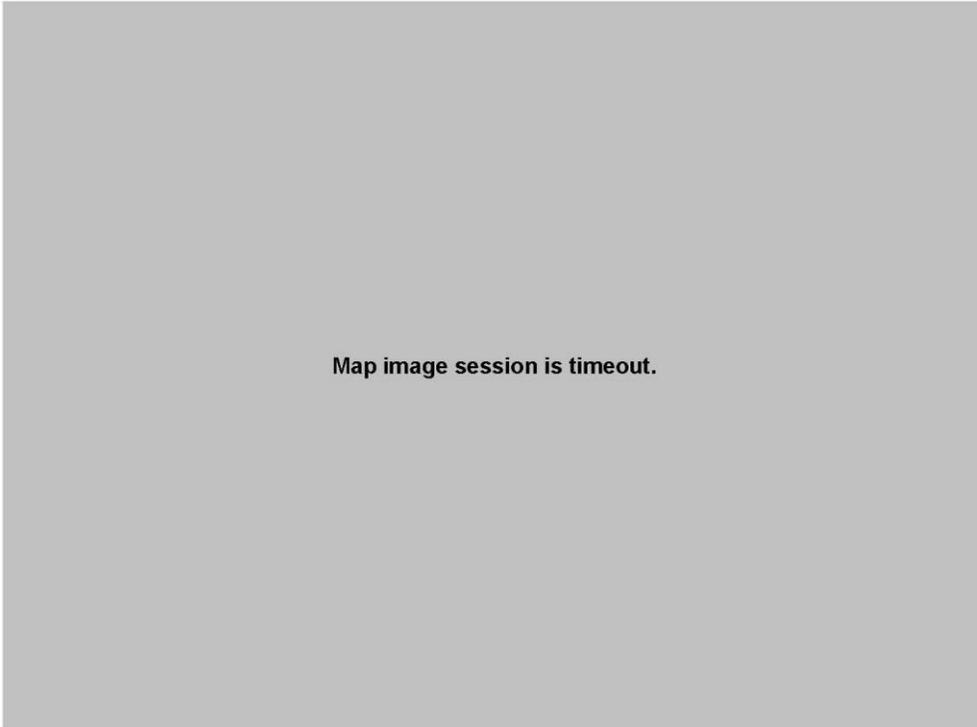


the User Specified Area, NORTH CAROLINA, EPA Region 4

Approximate Population: 0

Input Area (sq. miles): 2.47

(The study area contains 1 blockgroup(s) with zero population.)



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0



EJSCREEN Report (Version 2020)



the User Specified Area, NORTH CAROLINA, EPA Region 4

Approximate Population: 0

Input Area (sq. miles): 2.47

(The study area contains 1 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)	N/A	8.25	N/A	8.57	N/A	8.55	N/A
Ozone (ppb)	N/A	42.9	N/A	38	N/A	42.9	N/A
NATA* Diesel PM ($\mu\text{g}/\text{m}^3$)	N/A	0.309	N/A	0.417	N/A	0.478	N/A
NATA* Cancer Risk (lifetime risk per million)	N/A	34	N/A	36	N/A	32	N/A
NATA* Respiratory Hazard Index	N/A	0.46	N/A	0.52	N/A	0.44	N/A
Traffic Proximity and Volume (daily traffic count/distance to road)	N/A	230	N/A	350	N/A	750	N/A
Lead Paint Indicator (% Pre-1960 Housing)	N/A	0.16	N/A	0.15	N/A	0.28	N/A
Superfund Proximity (site count/km distance)	N/A	0.082	N/A	0.083	N/A	0.13	N/A
RMP Proximity (facility count/km distance)	N/A	0.39	N/A	0.6	N/A	0.74	N/A
Hazardous Waste Proximity (facility count/km distance)	N/A	1.3	N/A	0.91	N/A	5	N/A
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	N/A	0.16	N/A	0.65	N/A	9.4	N/A
Demographic Indicators							
Demographic Index	N/A	36%	N/A	37%	N/A	36%	N/A
People of Color Population	N/A	37%	N/A	39%	N/A	39%	N/A
Low Income Population	N/A	36%	N/A	36%	N/A	33%	N/A
Linguistically Isolated Population	N/A	2%	N/A	3%	N/A	4%	N/A
Population With Less Than High School Education	N/A	13%	N/A	13%	N/A	13%	N/A
Population Under 5 years of age	N/A	6%	N/A	6%	N/A	6%	N/A
Population over 64 years of age	N/A	15%	N/A	17%	N/A	15%	N/A

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <https://www.epa.gov/national-air-toxics-assessment>.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

April 20, 2021

3/3



EJSCREEN ACS Summary Report



Location: User-specified polygonal location
 Ring (buffer): 0-miles radius
 Description:

Summary of ACS Estimates		2014 - 2018
Population		0
Population Density (per sq. mile)		0
People of Color Population		0
% People of Color Population		0%
Households		0
Housing Units		0
Housing Units Built Before 1950		0
Per Capita Income		0
Land Area (sq. miles) (Source: SF1)		1.78
% Land Area		100%
Water Area (sq. miles) (Source: SF1)		0.01
% Water Area		0%

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	0	0%	12
Population Reporting One Race	0	0%	72
White	0	0%	12
Black	0	0%	12
American Indian	0	0%	12
Asian	0	0%	12
Pacific Islander	0	0%	12
Some Other Race	0	0%	12
Population Reporting Two or More Races	0	0%	12
Total Hispanic Population	0	0%	12
Total Non-Hispanic Population	0		
White Alone	0	0%	12
Black Alone	0	0%	12
American Indian Alone	0	0%	12
Non-Hispanic Asian Alone	0	0%	12
Pacific Islander Alone	0	0%	12
Other Race Alone	0	0%	12
Two or More Races Alone	0	0%	12
Population by Sex			
Male	0	0%	12
Female	0	0%	12
Population by Age			
Age 0-4	0	0%	12
Age 0-17	0	0%	12
Age 18+	0	0%	12
Age 65+	0	0%	12

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
 N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2014 - 2018



EJSCREEN ACS Summary Report



Location: User-specified polygonal location
 Ring (buffer): 0-miles radius
 Description:

	2014 - 2018 ACS Estimates	Percent	MDE (±)
Population 25+ by Educational Attainment			
Total	0	0%	12
Less than 9th Grade	0	0%	12
9th - 12th Grade, No Diploma	0	0%	12
High School Graduate	0	0%	12
Some College, No Degree	0	0%	12
Associate Degree	0	0%	12
Bachelor's Degree or more	0	0%	12
Population Age 5+ Years by Ability to Speak English			
Total	0	0%	12
Speak only English	0	0%	12
Non-English at Home ¹⁺²⁺³⁺⁴	0	0%	12
¹ Speak English "very well"	0	0%	12
² Speak English "well"	0	0%	12
³ Speak English "not well"	0	0%	12
⁴ Speak English "not at all"	0	0%	12
³⁺⁴ Speak English "less than well"	0	0%	12
²⁺³⁺⁴ Speak English "less than very well"	0	0%	12
Linguistically Isolated Households*			
Total	0	0%	12
Speak Spanish	0	0%	12
Speak Other Indo-European Languages	0	0%	12
Speak Asian-Pacific Island Languages	0	0%	12
Speak Other Languages	0	0%	12
Households by Household Income			
Household Income Base	0	0%	12
< \$15,000	0	0%	12
\$15,000 - \$25,000	0	0%	12
\$25,000 - \$50,000	0	0%	12
\$50,000 - \$75,000	0	0%	12
\$75,000 +	0	0%	12
Occupied Housing Units by Tenure			
Total	0	0%	12
Owner Occupied	0	0%	12
Renter Occupied	0	0%	12
Employed Population Age 16+ Years			
Total	0	0%	12
In Labor Force	0	0%	12
Civilian Unemployed in Labor Force	0	0%	12
Not In Labor Force	0	0%	12

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.

N/A means not available. Source: U.S. Census Bureau, American Community Survey (ACS)

*Households in which no one 14 and over speaks English "very well" or speaks English only.



EJSCREEN ACS Summary Report



Location: User-specified polygonal location
 Ring (buffer): 0-miles radius
 Description:

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	N/A	N/A	N/A
English	N/A	N/A	N/A
Spanish	N/A	N/A	N/A
French	N/A	N/A	N/A
French Creole	N/A	N/A	N/A
Italian	N/A	N/A	N/A
Portuguese	N/A	N/A	N/A
German	N/A	N/A	N/A
Yiddish	N/A	N/A	N/A
Other West Germanic	N/A	N/A	N/A
Scandinavian	N/A	N/A	N/A
Greek	N/A	N/A	N/A
Russian	N/A	N/A	N/A
Polish	N/A	N/A	N/A
Serbo-Croatian	N/A	N/A	N/A
Other Slavic	N/A	N/A	N/A
Armenian	N/A	N/A	N/A
Persian	N/A	N/A	N/A
Gujarathi	N/A	N/A	N/A
Hindi	N/A	N/A	N/A
Urdu	N/A	N/A	N/A
Other Indic	N/A	N/A	N/A
Other Indo-European	N/A	N/A	N/A
Chinese	N/A	N/A	N/A
Japanese	N/A	N/A	N/A
Korean	N/A	N/A	N/A
Mon-Khmer, Cambodian	N/A	N/A	N/A
Hmong	N/A	N/A	N/A
Thai	N/A	N/A	N/A
Laotian	N/A	N/A	N/A
Vietnamese	N/A	N/A	N/A
Other Asian	N/A	N/A	N/A
Tagalog	N/A	N/A	N/A
Other Pacific Island	N/A	N/A	N/A
Navajo	N/A	N/A	N/A
Other Native American	N/A	N/A	N/A
Hungarian	N/A	N/A	N/A
Arabic	N/A	N/A	N/A
Hebrew	N/A	N/A	N/A
African	N/A	N/A	N/A
Other and non-specified	N/A	N/A	N/A
Total Non-English	N/A	N/A	N/A

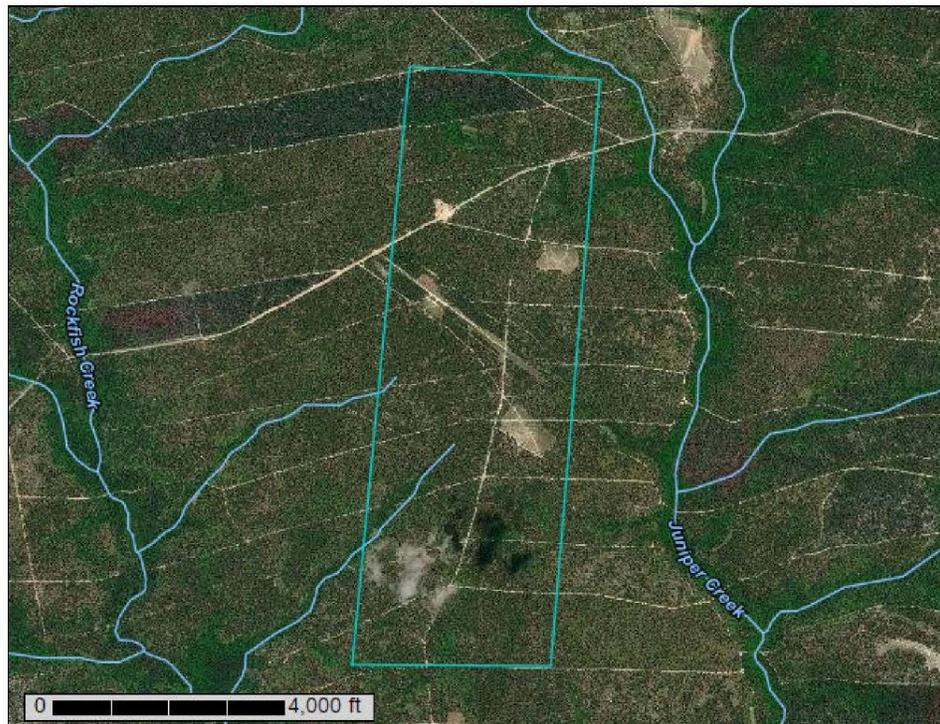
Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
 N/A means not available. Source: U.S. Census Bureau, American Community Survey (ACS) 2014 - 2018.
 *Population by Language Spoken at Home is available at the census tract summary level and up.

Inclusion S: Soil Survey



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hoke County, North Carolina



March 19, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Hoke County, North Carolina.....	13
BaB—Blaney loamy sand, 2 to 8 percent slopes.....	13
BaD—Blaney loamy sand, 8 to 15 percent slopes.....	14
CaB—Candor sand, 1 to 8 percent slopes.....	15
CaD—Candor sand, 8 to 15 percent slopes.....	16
DhA—Dothan loamy sand, 0 to 2 percent slopes.....	17
FuB—Fuquay sand, 0 to 4 percent slopes.....	18
GdB—Gilead loamy sand, 2 to 8 percent slopes.....	19
JT—Johnston loam.....	21
VaB—Vaucluse loamy sand, 2 to 8 percent slopes.....	22
VaD—Vaucluse loamy sand, 8 to 15 percent slopes.....	24
References	26

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

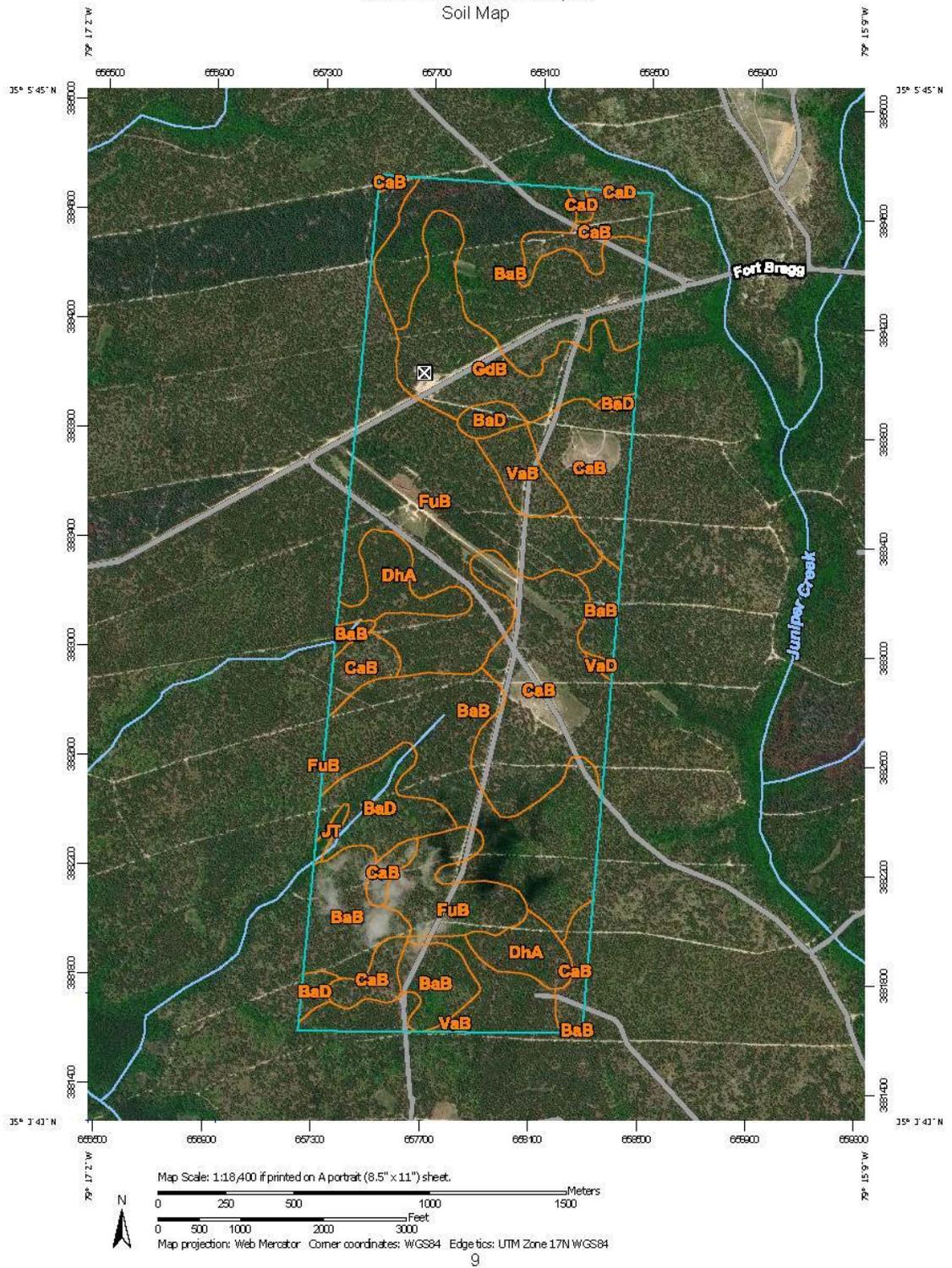
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND		MAP INFORMATION
Area of Interest (AOI)		The soil surveys that comprise your AOI were mapped at 1:24,000.
 Area of Interest (AOI)	 Spoil Area	
Soils		Please rely on the bar scale on each map sheet for map measurements.
 Soil Map Unit Polygons	 Stony Spot	
 Soil Map Unit Lines	 Very Stony Spot	Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG 3857)
 Soil Map Unit Points	 Wet Spot	
Special Point Features		Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.
 Blowout	 Other	
 Borrow Pit	 Special Line Features	This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.
 Clay Spot	Water Features	
 Closed Depression	 Streams and Canals	Soil Survey Area: Hoke County, North Carolina Survey Area Data: Version 16, Sep 16, 2019
 Gravel Pit	Transportation	
 Gravelly Spot	 Rails	Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.
 Landfill	 Interstate Highways	
 Lava Flow	 US Routes	Date(s) aerial images were photographed: Jun 15, 2015—Dec 4, 2017
 Marsh or swamp	 Major Roads	
 Mine or Quarry	 Local Roads	The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
 Miscellaneous Water	Background	
 Perennial Water	 Aerial Photography	
 Rock Outcrop		
 Saline Spot		
 Sandy Spot		
 Severely Eroded Spot		
 Sinkhole		
 Slide or Slip		
 Sodic Spot		

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BaB	Blaney loamy sand, 2 to 8 percent slopes	262.5	33.2%
BaD	Blaney loamy sand, 8 to 15 percent slopes	39.1	4.9%
CaB	Candor sand, 1 to 8 percent slopes	168.7	21.3%
CaD	Candor sand, 8 to 15 percent slopes	1.9	0.2%
DhA	Dothan loamy sand, 0 to 2 percent slopes	34.2	4.3%
FuB	Fuquay sand, 0 to 4 percent slopes	168.8	21.3%
GdB	Gilead loamy sand, 2 to 8 percent slopes	66.1	8.4%
JT	Johnston loam	2.1	0.3%
VaB	Vaucluse loamy sand, 2 to 8 percent slopes	46.4	5.9%
VaD	Vaucluse loamy sand, 8 to 15 percent slopes	1.3	0.2%
Totals for Area of Interest		791.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

Custom Soil Resource Report

management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hoke County, North Carolina

BaB—Blaney loamy sand, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: w75g

Elevation: 160 to 660 feet

Mean annual precipitation: 38 to 52 inches

Mean annual air temperature: 61 to 70 degrees F

Frost-free period: 210 to 245 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Blaney and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blaney

Setting

Landform: Low hills

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: loamy sand

E - 4 to 25 inches: loamy sand

Bt - 25 to 62 inches: sandy clay loam

C - 62 to 80 inches: loamy coarse sand

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: C

Ecological site: Loamy Summit Woodland - PROVISIONAL (F137XY002GA)

Hydric soil rating: No

BaD—Blaney loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: w75h
Elevation: 160 to 660 feet
Mean annual precipitation: 38 to 52 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 210 to 245 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Blaney and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blaney

Setting

Landform: Low hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: loamy sand
E - 4 to 25 inches: loamy sand
Bt - 25 to 62 inches: sandy clay loam
C - 62 to 80 inches: loamy coarse sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy Backslope Woodland - PROVISIONAL (F137XY006GA)
Hydric soil rating: No

CaB—Candor sand, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: w75q
Elevation: 80 to 330 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 210 to 265 days
Farmland classification: Not prime farmland

Map Unit Composition

Candor and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candor

Setting

Landform: Ridges on marine terraces
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and loamy marine deposits and/or eolian sands

Typical profile

A - 0 to 8 inches: sand
E - 8 to 26 inches: sand
Bt - 26 to 38 inches: loamy sand
E' - 38 to 62 inches: sand
B't - 62 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: Dry Sandy Upland Woodland (F137XY001GA)
Hydric soil rating: No

CaD—Candor sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: w75r
Elevation: 80 to 330 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 210 to 265 days
Farmland classification: Not prime farmland

Map Unit Composition

Candor and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Candor

Setting

Landform: Ridges on marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and loamy marine deposits and/or eolian sands

Typical profile

A - 0 to 8 inches: sand
E - 8 to 26 inches: sand
Bt - 26 to 38 inches: loamy sand
E' - 38 to 62 inches: sand
B^t - 62 to 80 inches: sandy clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: Dry Sandy Backslope Woodland - PROVISIONAL (F137XY004GA)
Hydric soil rating: No

DhA—Dothan loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wb8y
Elevation: 50 to 660 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 220 to 280 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dothan and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dothan

Setting

Landform: Interfluves
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy marine deposits

Typical profile

Ap - 0 to 8 inches: loamy sand
E - 8 to 12 inches: loamy sand
Bt - 12 to 45 inches: sandy clay loam
Btv - 45 to 79 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 36 to 59 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Forage suitability group: Loamy and clayey soils on rises and knolls of mesic uplands (G133AA321FL)
Hydric soil rating: No

Minor Components

Norfolk

Percent of map unit: 7 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Fuquay

Percent of map unit: 4 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Goldsboro

Percent of map unit: 4 percent
Landform: Interfluves
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

FuB—Fuquay sand, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: w767
Elevation: 160 to 660 feet
Mean annual precipitation: 38 to 52 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 210 to 245 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Fuquay and similar soils: 85 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fuquay

Setting

Landform: Low hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest

Custom Soil Resource Report

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

Ap - 0 to 8 inches: sand
E - 8 to 34 inches: sand
Bt1 - 34 to 45 inches: sandy loam
Bt2 - 45 to 50 inches: sandy clay loam
Btv - 50 to 96 inches: sandy clay loam
C - 96 to 109 inches: loamy sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: 35 to 60 inches to plinthite
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Bibb, undrained

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

GdB—Gilead loamy sand, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: w768
Elevation: 160 to 660 feet
Mean annual precipitation: 38 to 52 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 210 to 245 days
Farmland classification: All areas are prime farmland

Custom Soil Resource Report

Map Unit Composition

Gilead and similar soils: 90 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilead

Setting

Landform: Low hills

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy and clayey marine deposits

Typical profile

Ap - 0 to 5 inches: loamy sand

Bt1 - 5 to 8 inches: sandy loam

Bt2 - 8 to 42 inches: sandy clay

Bt3 - 42 to 52 inches: sandy clay loam

C1 - 52 to 76 inches: clay

C2 - 76 to 80 inches: gravelly sand

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Bibb, undrained

Percent of map unit: 3 percent

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: Yes

Johnston, undrained

Percent of map unit: 2 percent

Landform: Flood plains

Down-slope shape: Concave

Across-slope shape: Linear

Custom Soil Resource Report

Hydric soil rating: Yes

JT—Johnston loam

Map Unit Setting

National map unit symbol: w76f
Elevation: 80 to 330 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 210 to 265 days
Farmland classification: Not prime farmland

Map Unit Composition

Johnston, undrained, and similar soils: 85 percent
Johnston, drained, and similar soils: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Johnston, Undrained

Setting

Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy and loamy alluvium

Typical profile

A - 0 to 30 inches: mucky loam
Cg1 - 30 to 34 inches: loamy fine sand
Cg2 - 34 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Ponded
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Description of Johnston, Drained

Setting

Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy and loamy alluvium

Typical profile

A - 0 to 30 inches: mucky loam
Cg1 - 30 to 34 inches: loamy fine sand
Cg2 - 34 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Pondered
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

VaB—Vaucluse loamy sand, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: w779
Elevation: 80 to 660 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 210 to 265 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Vaucluse and similar soils: 80 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vaucluse

Setting

Landform: Low hills

Custom Soil Resource Report

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy and sandy marine deposits

Typical profile

Ap - 0 to 6 inches: loamy sand
E - 6 to 15 inches: loamy sand
Bt - 15 to 29 inches: sandy clay loam
Btx - 29 to 58 inches: sandy clay loam
BC - 58 to 80 inches: sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 15 to 35 inches to fragipan
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Ecological site: Loamy Summit Woodland - PROVISIONAL (F137XY002GA)
Hydric soil rating: No

Minor Components

Bibb, undrained

Percent of map unit: 3 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

Johnston, undrained

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

VaD—Vaucluse loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: w77b
Elevation: 80 to 660 feet
Mean annual precipitation: 38 to 55 inches
Mean annual air temperature: 59 to 70 degrees F
Frost-free period: 210 to 265 days
Farmland classification: Not prime farmland

Map Unit Composition

Vaucluse and similar soils: 80 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vaucluse

Setting

Landform: Low hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy and sandy marine deposits

Typical profile

Ap - 0 to 6 inches: loamy sand
E - 6 to 15 inches: loamy sand
Bt - 15 to 29 inches: sandy clay loam
Btx - 29 to 58 inches: sandy clay loam
BC - 58 to 80 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 15 to 35 inches to fragipan
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy Backslope Woodland - PROVISIONAL (F137XY006GA)
Hydric soil rating: No

Minor Components

Bibb, undrained

Percent of map unit: 3 percent

Landform: Flood plains

Landform position (two-dimensional): Toeslope

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: Yes

Johnston, undrained

Percent of map unit: 2 percent

Landform: Flood plains

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: Yes

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelp2rb1043084>

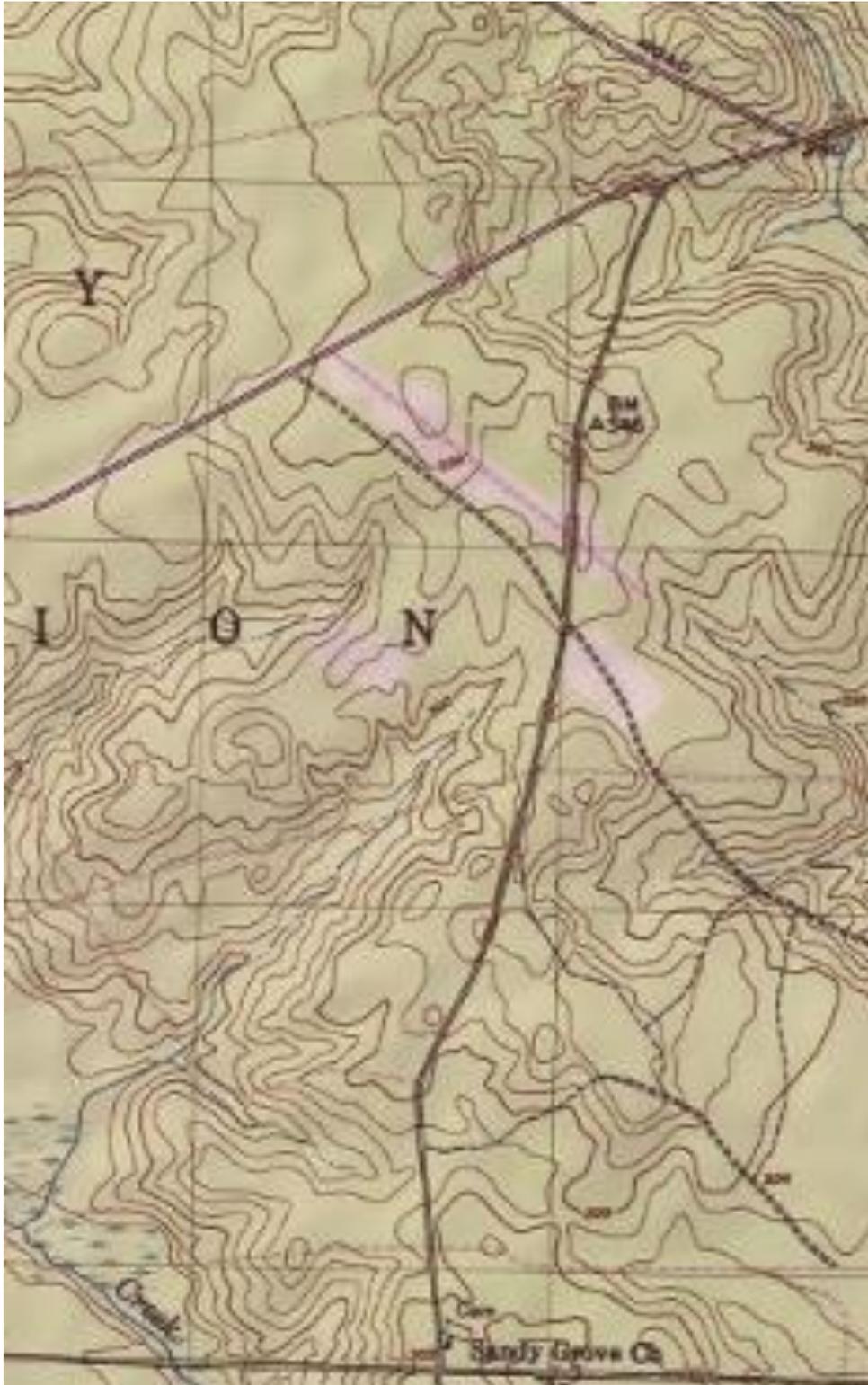
Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Inclusion T: MPTR topographic map



Inclusion U: BA and BA Addendum

BA Dated 1 December 2021

**DEPARTMENT OF THE ARMY
DIRECTORATE OF PUBLIC WORKS
U.S. ARMY GARRISON FORT BRAGG
INSTALLATION MANAGEMENT COMMAND
FORT BRAGG, NORTH CAROLINA**

BIOLOGICAL ASSESSMENT
For The
Construction and Operation of the Multipurpose Training Range (MPTR)
At Fort Bragg Military Installation, North Carolina

Prepared by
Department of the Army
Directorate of Public Works
Environmental Division

Fort Bragg, North Carolina

November 2021

(Page left blank intentionally)

Table of Contents

List of Figures.....	iii
List of Tables.....	v
1. Introduction	1
2. Action Area.....	1
3. Consultation History	6
4. Description of Proposed Action	7
5. Status of Protected Species within the Action Area.....	9
6. Methodology.....	18
7. Analysis of Effects.....	25
8. Conservation Measures	57
9. Conclusion	66
10. References.....	69
11. List of Preparers.....	73
12. List of Contributors / Persons Consulted.....	73

(Page left blank intentionally)

List of Figures

Figure 1.	Location of Fort Bragg Military Installation, Cumberland, Harnett, Hoke and Moore County, NC and Camp Mackall, Moore, Richmond and Scotland County, NC.....	3
Figure 2.	Location of Major Training Areas on Fort Bragg Military Installation, NC.	4
Figure 3.	Location Map of MPTR.....	5
Figure 4.	MPTR Layout.....	8
Figure 5.	Federal Endangered Plant Species Distribution on Fort Bragg and Camp Mackall.	9
Figure 6.	Location of the RCW NC Sandhills East Primary Core population and NC Sandhills West Essential Support population, NC Sandhills Physiographic Region.	11
Figure 7.	RCW Cluster Distribution on Fort Bragg and Camp Mackall.	12
Figure 8.	SDZ for Small Arms Direct-Fire Weapons.....	19
Figure 9.	Rare Plants.....	24
Figure 10.	RCW Cluster Projected Take	26
Figure 11.	RCW Cavity Trees Lost	30
Figure 12.	RCW Cluster 251 Cavity Tree Proximities to MPTR.....	37
Figure 13.	Group Level Analysis.....	39
Figure 14.	Neighborhood Level Analysis	43
Figure 15.	American Chaffseed Site	49
Figure 16.	MFP Tank and Maneuver Trails	52
Figure 17.	Projected Locations of Tactical Equipment Maintenance Facilities (TEMFs)	53
Figure 18.	Projected Location for Future Infantry Platoon Battle Course.....	55
Figure 19.	Projected Location for Future Scout/Recce Range.....	56
Figure 20.	Projected Location for Future Auto Record Fire Range.....	57
Figure 21.	Location of Sandy Grove TAG.....	60

List of Figures (cont.)

Figure 22. Timber Stands: Priority Thinning	61
Figure 23. Planned Thinning Operations	62
Figure 24. RCW Monitoring Area.....	64

List of Tables

Table 1. Active Clusters and PBGs on Fort Bragg and Camp Mackall, 1998-2020.....	13
Table 2. Individual Plant Counts of American Chaffseed (<i>Schwalbea americana</i>).....	18
Table 3. FHA Summary.....	28
Table 4. RCW Cavity Tree Analysis.....	31
Table 5. Landscape Density Analysis: active clusters w/in 1.25 miles from center of clusters adjacent to project area	40
Table 6. Neighborhood Level Analysis.....	44

List of Appendices

Rare Plant Survey MemorandumAppendix 1
RCW Forage Assessment ReportsAppendix 2
RCW Monitoring Memorandum.....Appendix 3

1. Introduction

The proposed action is for the construction and operation of a multipurpose training range (MPTR) at Fort Bragg, North Carolina (NC). Fort Bragg is deficient of mounted gunnery ranges according to the 8-9 October 2019 planning charrette lead by the Department of the Army Combined Arms Center. Fort Bragg requires a mounted gunnery range allowing long-distance firing for Soldiers to both train and qualify. The proposed automated range would support mounted vehicles to include the new mobile protected firepower (MPF) vehicle. The MPF is capable of firing 105 millimeter (mm) or 120 mm rounds following gunnery standard for the mobile gun system (MGS or M1). The three Infantry Brigade Combat Teams (IBCT) at Fort Bragg would be equipped with MPF vehicles.

The proposed MPTR is specifically designed to satisfy the training and qualification requirements for the crews, teams, and sections of combat units. This range would support dismounted infantry squad tactical live-fire operations, either independently of, or simultaneously with supporting vehicles. The range would be utilized to train and test armor, infantry, and aviation teams, crews, and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets would be fully automated, and the event specific target scenario would be computerized and operated from an on-site control tower. Captured audio/video would be compiled and available to the unit at the after action review (AAR).

This Biological Assessment has been prepared to assess the proposed construction and operation of the MPTR located on Fort Bragg Military Installation, North Carolina and its effects on federally listed species in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 V.S.C. 1531 etseq.).

2. Action Area

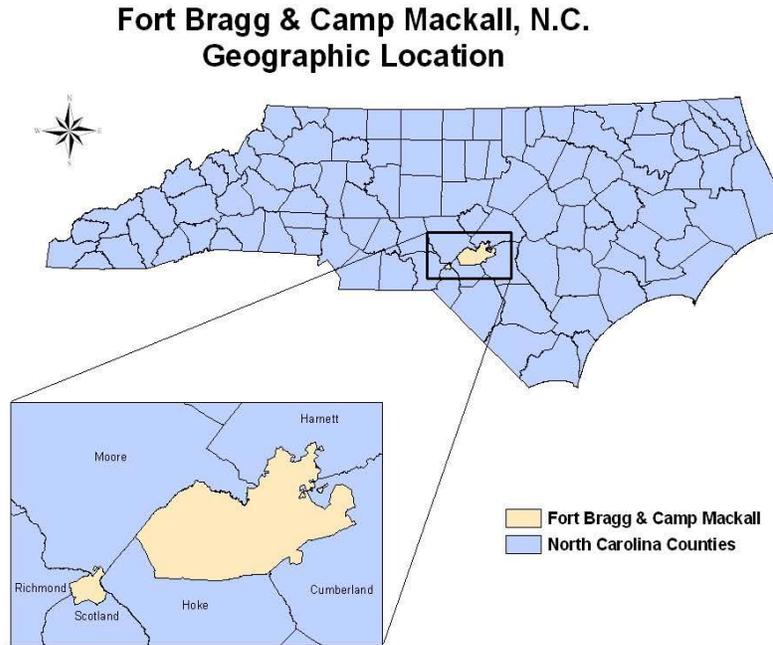
The Endangered Species Consultation Handbook (USFWS and NMFS 1998) defines the Action Area as all areas to be affected directly and indirectly by the Federal action and not merely the immediate area involved in the action. The Action Area includes all areas on Fort Bragg and areas outside of the Installation, but within the RCW "neighborhood" and/ or within the RCW survey area for the proposed action (**Figure 1**). This area encompasses the area of the proposed MPTR that would be considered the Project Area.

Fort Bragg Military Installation (hereafter, the "Installation") is located near Fayetteville, North Carolina. The installation encompasses 153,562 acres (62,140 hectares (ha)) within four counties (Cumberland, Harnett, Hoke, and Moore) in south central NC. Total installation acreage is 162,597 acres (65,800 hectares (ha)), including Army-acquired portions of Pope Army Air Field (PAAF).

Fort Bragg and Camp Mackall contain one of the largest remaining contiguous blocks of longleaf pine forest, which once dominated the entire southeastern Coastal Plain from southern Virginia to Texas. Longleaf pine communities support some of the greatest

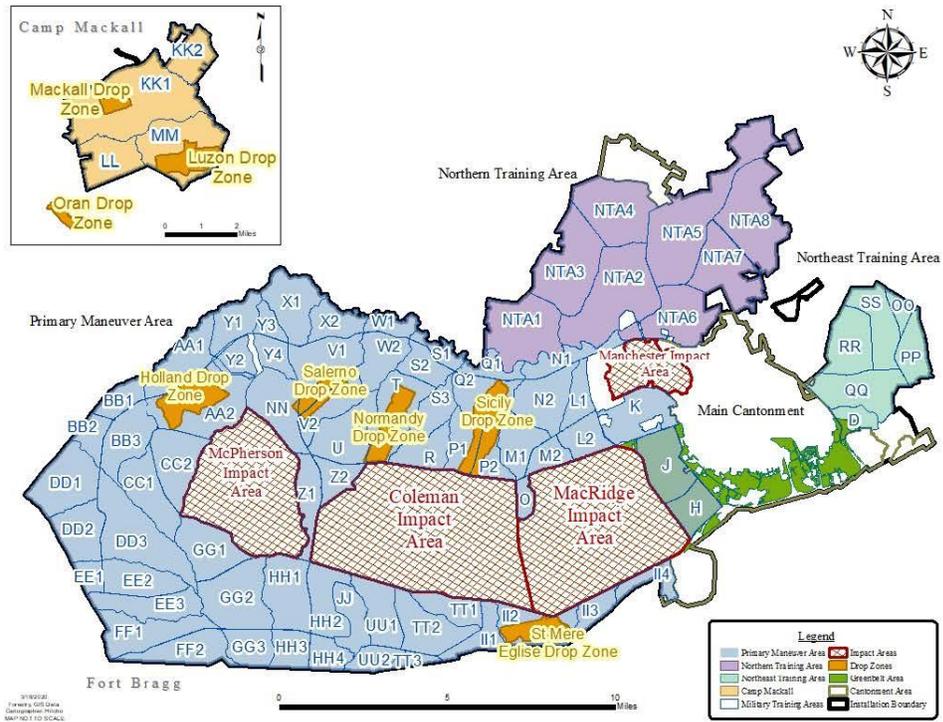
species richness in temperate North America (up to 52 species of plants in a single square meter), and contain more rare species than any other community type in the state (Schafale and Weakley, 1990). In the North Carolina Sandhills, the dominant natural vegetation consists of pine-scrub oak sandhill and xeric sandhill scrub communities. These communities are characterized by an open overstory of longleaf pine, an understory of scattered scrub oaks, and a diverse herbaceous stratum that includes wiregrass as a dominant species.

Figure 1. Location of Fort Bragg Military Installation, Cumberland, Harnett, Hoke and Moore County, NC and Camp Mackall, Moore, Richmond and Scotland County, NC.



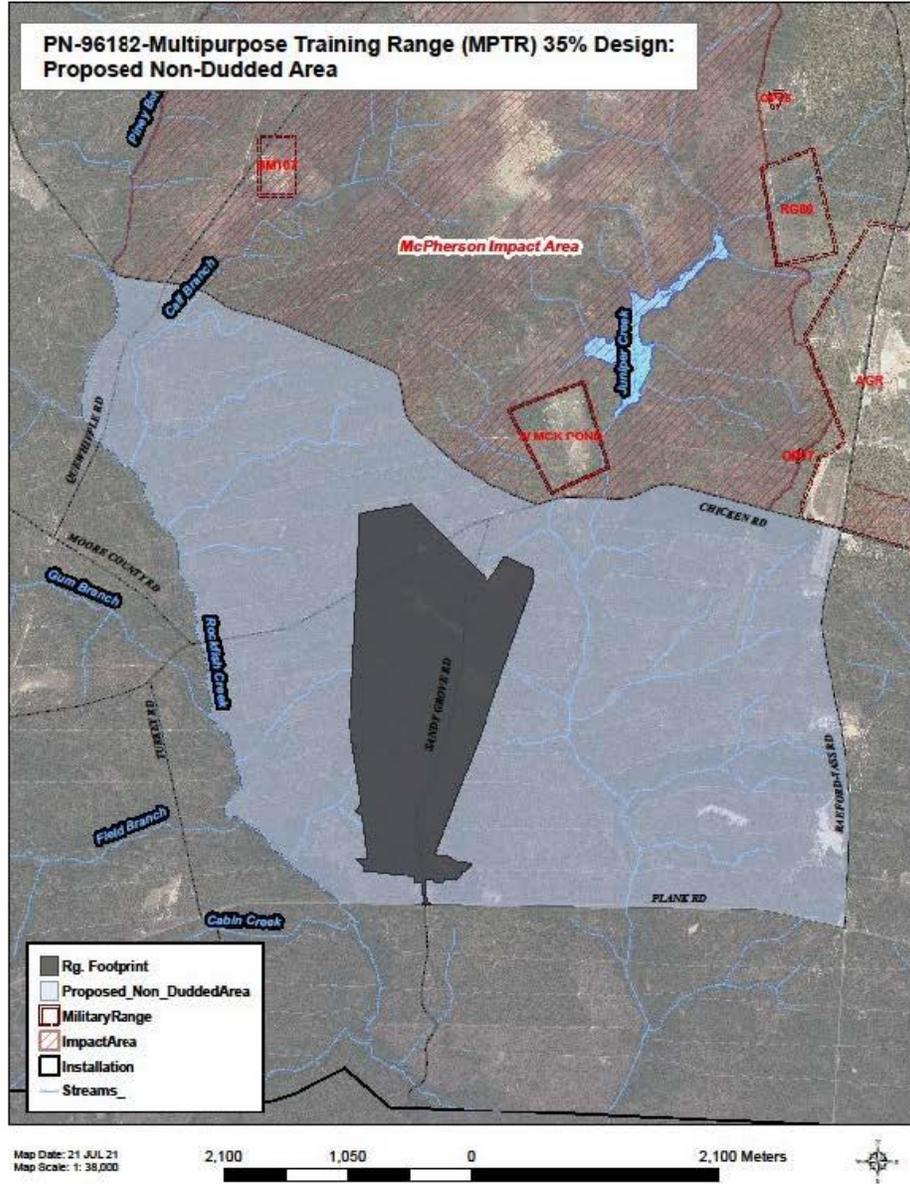
The majority of Fort Bragg lands consist of range and training areas. Geographically, Range and Training Areas are divided into the following five major areas from east to west: the Northeast Training Area (NEA), the Main Cantonment Area (MCA), the Northern Training Area (NTA), the Primary Maneuver Area, and Camp Mackall. The primary maneuver training area, which is 74,834 acres, encompasses major training facilities to include maneuver areas, ranges, impact areas, and drop zones. Fort Bragg has four impact areas (Manchester, Coleman, MacRidge, and McPherson) encompassing a total area of 33,000 acres, and seven major parachute drop zones. The distribution of Range and Training Areas on Fort Bragg and Camp Mackall are shown in **Figure 2**.

Figure 2. Location of Major Training Areas on Fort Bragg Military Installation, NC.



The MPTR proposed location is south of the existing McPherson Impact Area. Implementation of this range construction would expand McPherson Impact Area west to Rockfish Creek, east to Raeford Vass Road, and south to Plank Road. The MPTR would start north of Plank Road at Firebreak 7 expanding north in order to avoid demolition of Sandy Grove Church and the associated cemetery located at Plank Road. The newly expanded portion of McPherson Impact Area would be non-duded (**Figure 3**).

Figure 3. Location Map of MPTR



3. Consultation History

The following is a list of relevant consultations between Fort Bragg and the U.S. Fish and Wildlife Service, Raleigh Field Office:

1. Woodland Management Plan, November 25, 1980.
2. Multi-Purpose Range Complex, March 15, 1984.
3. Fort Bragg 5-Year Range Modernization Program and Main Cantonment Projects, May 10, 1985.
4. Effects of Military and Associated Activities at Fort Bragg, Camp Mackall, and the Sandhills Game Lands, February 2, 1990.
5. Military Activities in the Coleman Danger Area (CDA), Fort Bragg, NC, July 31, 1992.
6. Military Activities in the MacRidge Danger/Impact Area (MDA), Fort Bragg, NC, December 8, 1994.
7. Management Guidelines for the RCW on Army Installations, October 25, 1996.
8. Fort Bragg and Camp Mackall ESMP at Fort Bragg, NC, December 4, 1997.
9. Digital Multipurpose Range Complex (DMPRC), Range 78/79 at Fort Bragg, NC, August 17, 2006.
10. Endangered Species Management Component (ESMC) at Fort Bragg Military Installation, NC, February 27, 2009.
11. Integrated Natural Resources Management Plan, 2011-2015, Fort Bragg and Camp Mackall, NC, August 15, 2012.
12. Aerial Gunnery Range (AGR), Fort Bragg Military Installation, NC, October 5, 2012.
13. Construction of a new small arms Range 61, Fort Bragg Military Installation, NC, April 12, 2016.
14. Integrated Natural Resources Management Plan, 2019-2023, Fort Bragg and Camp Mackall, NC, March 25, 2020.

4. Description of Proposed Action

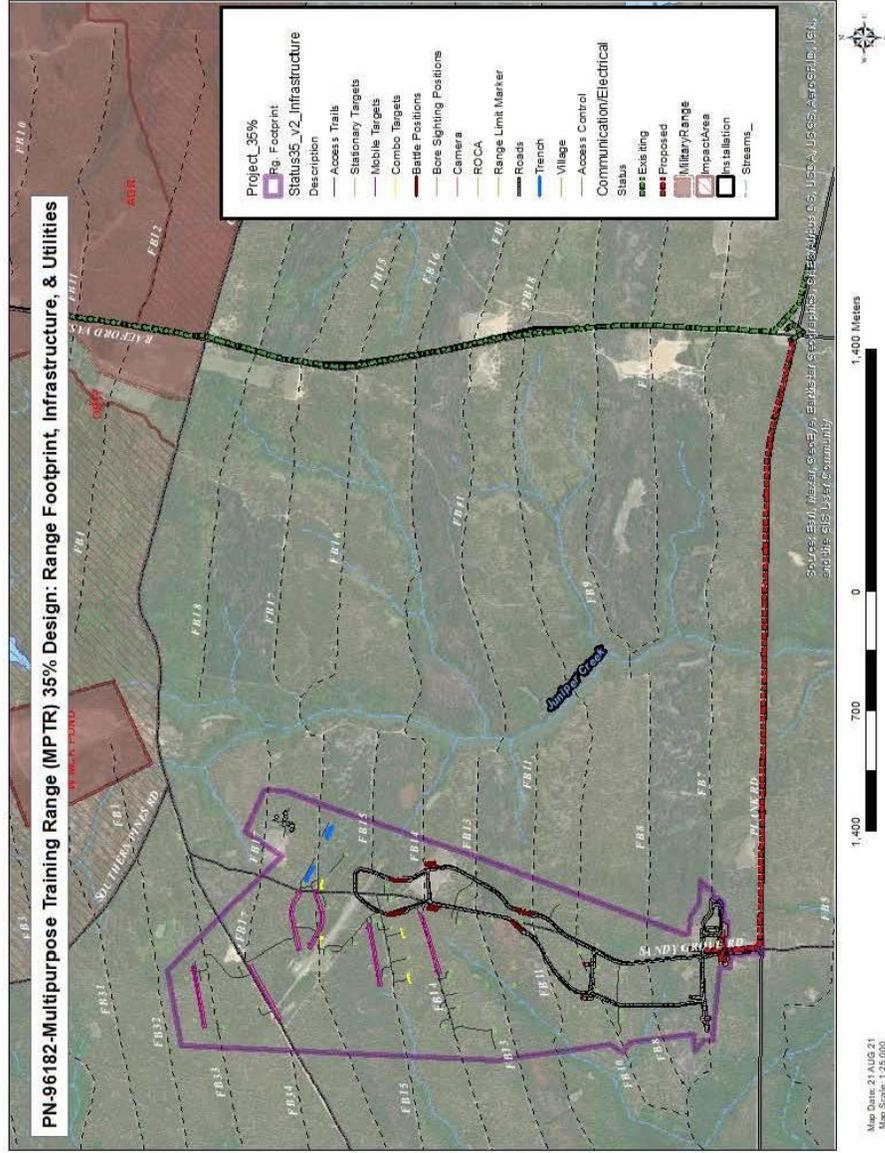
The proposed action would construct and operate an automated training range that would support mounted vehicles to include the new mobile protected firepower (MPF) vehicle. The MPF is capable of firing 105 millimeter (mm) or 120 mm rounds following gunnery standard for the mobile gun system (MGS or M1).

Range construction would begin in FY2023. Primary facilities include a 578 square foot (ft²) control tower, one 1800 ft² operations facility, port-a-john pads with three sided wind walls, a 726 ft² bleacher enclosure, 800 ft² covered mess, 1064 ft² instrumented range after action review building, 450 ft² ammunition loading dock, six bivouac pads (15 by 25 feet each), and unit storage. The range would consist of six moving ammunition targets, 30 stationary targets and berms, four moving infantry targets, 122 stationary infantry targets, ten battle positions, five urban facades, one urban cluster consisting of seven buildings, one helicopter tactical landing area, four camera towers and two machine gun bunkers. The project would require utilities to include, storm drainage, fencing, paving, electricity, and communications. This would include connecting to electrical utilities approximately 13,000 linear feet (LF) from the site; and direct-burying 13,000 LF of fiber optic cable lines from an existing communication node along Plank Road to the proposed project area. Potable water will be trucked on site and a portable toilet contract will provide wastewater services.

Additional construction would include a 17,000 LF by 20 foot (ft)-wide tank trail; 35,000 LF by 8 ft-wide maintenance trail; site clearing and grading; fencing; and gravel parking area. Range road construction will be 20-feet wide and road construction within the administrative facility section used for control and administrative reasons (range operations control area) will be 24-feet wide. The entire range will be cleared of vegetation (816 acres) and approximately 20% of the range will be grubbed (160 acres) (**Figure 4**).

Construction, operation and maintenance of the proposed project will occur throughout the year, during all times of day and through all phases of the species life cycles analyzed within this BA. The disturbance from the proposed electrical utilities and communication lines will occur in linear fashion mostly along previously disturbed road or electrical utility right-of-ways.

Figure 4. MPTR Layout

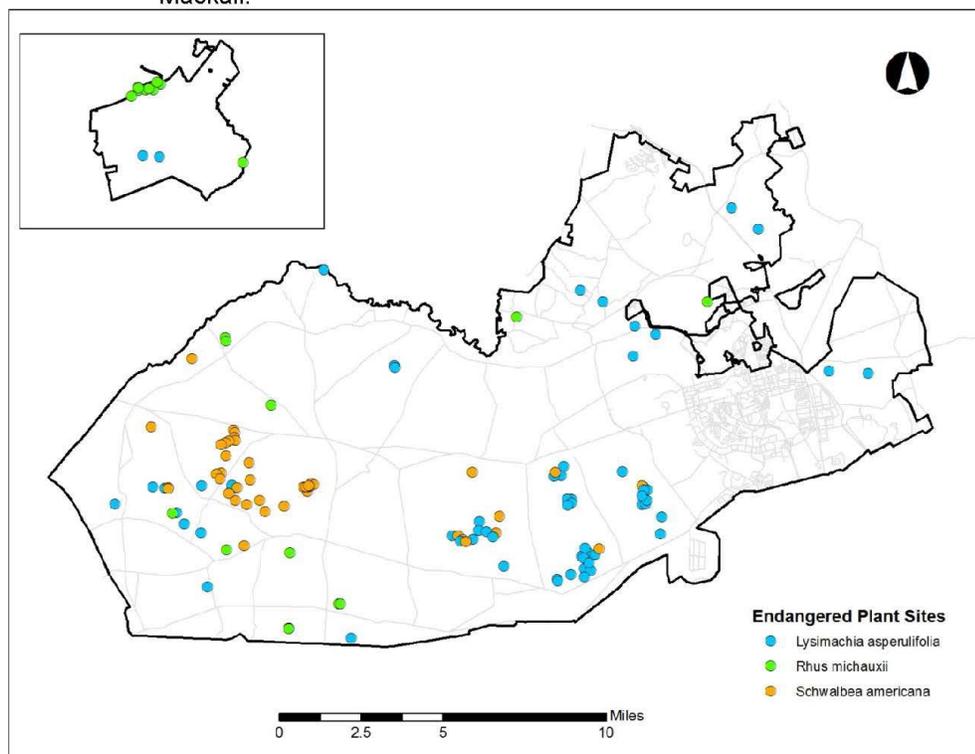


5. Status of Protected Species within the Action Area

Federally listed species include those listed as endangered or threatened by the United States Fish and Wildlife Service (USFWS) under the authority of the ESA. Fort Bragg is home to 5 federally endangered species. They include the Red-cockaded woodpecker (*Dryobates borealis*), Rough-leaved loosestrife (*Lysimachia asperulaefolia*), Michaux's sumac (*Rhus michauxii*), American chaffseed (*Schwalbea americana*), and the Saint Francis' Satyr butterfly (*Neonympha mitchellii francisci*).

Locations of the three federally listed plant species are widely distributed throughout the installation (**Figure 5**). The Saint Francis' Satyr (SFS) locations are protected and not depicted because of threat from collectors. The status for each of the federally listed species known to occur within the action area (Fort Bragg and Camp Mackall) is described below.

Figure 5. Federal Endangered Plant Species Distribution on Fort Bragg and Camp Mackall.



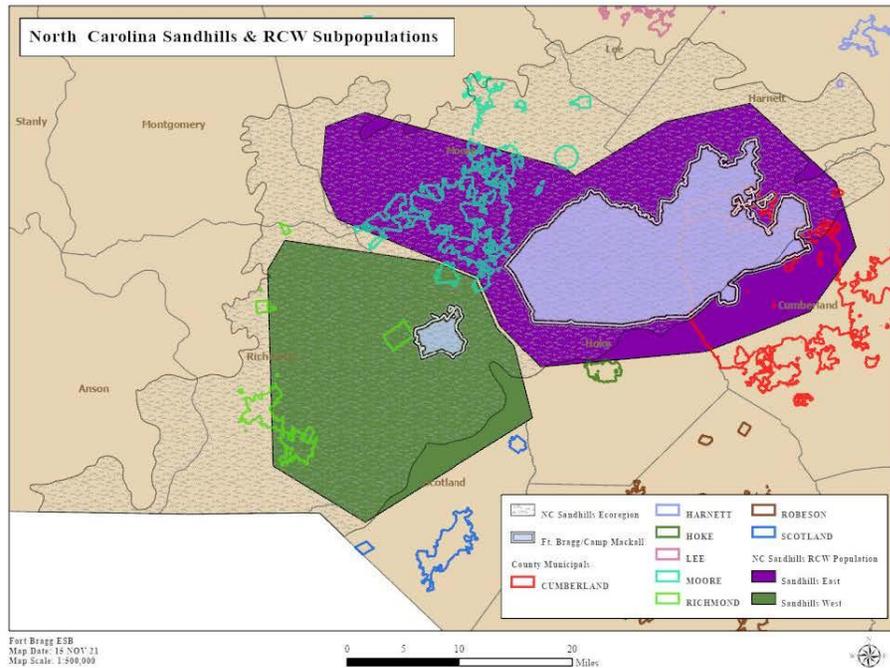
a. Red-cockaded woodpecker

Population Demographics and Goals

Sandhills East and West

The NC Sandhills is home to the second largest RCW population and is designated as one of thirteen Primary Core Recovery Populations in the RCW Recovery Plan (USFWS, 2003). Field data and a recent simulation modeling study indicate two demographically independent subpopulations exist in the sandhills, Sandhills East and Sandhills West. Sandhills East consists of all of Fort Bragg, areas of private land east of Fort Bragg in Cumberland County, south of Fort Bragg in Hoke County, the state-owned McCain tract, Weymouth Woods Sandhills Nature Preserve, and private lands in the Southern Pines Pinehurst (SOPI) area northwest of Fort Bragg. Sandhills West includes Camp Mackall, the Sandhills Game Lands (SGL), the Blue tract and other private lands in the vicinity of these areas. The Fort Bragg NEA functions demographically as part of the Sandhills East rather than as a separate, third subpopulation (Walters et al., 2004). Walters described that the two units (Sandhills East and Sandhills West) were once part of a single continuous population, connected by additional woodpecker groups inhabiting what is now known as the “gap”. In the 1980s, the birds in the gap were extirpated and as a result the Sandhills East and Sandhills West have become two distinct populations rather than a single population (**Figure 6**).

Figure 6. Location of the RCW NC Sandhills East Primary Core population and NC Sandhills West Essential Support population, NC Sandhills Physiographic Region.



Fort Bragg and Camp Mackall Populations

Fort Bragg contains the majority of the second largest population of RCWs, which are well distributed across the installation landscape (**Figure 7**). In 1998, the acquisition of the Overhills tract added 46 active RCW clusters to the Fort Bragg population. In 1998, there were 298 active clusters and an estimated 231 Potential Breeding Groups (PBGs) on Fort Bragg. The RCW population has continued to expand with the implementation of aggressive habitat management, which has included growing season prescribed burns, hardwood midstory control, thinning of dense stands of young pines, and a proactive artificial cavity program. In 2005, with the addition of PBGs on NCSCP lands, Fort Bragg became the first military installation and primary core population to reach its population goal (350 PBGs) under the 2003 RCW Recovery Plan. Monitoring during the 2020 breeding season documented 521 active clusters and an estimated 461 PBGs on Fort Bragg (**Table 1**). The NCSCP, a program that has increased the number of clusters counted towards recovery goals by protecting additional groups on adjacent lands in perpetuity, added 33 PBGs. Monitoring during

the 2020 season, also documented 19 active clusters and an estimated 19 PBGs on Camp Mackall.

Figure 7. RCW Cluster Distribution on Fort Bragg and Camp Mackall.

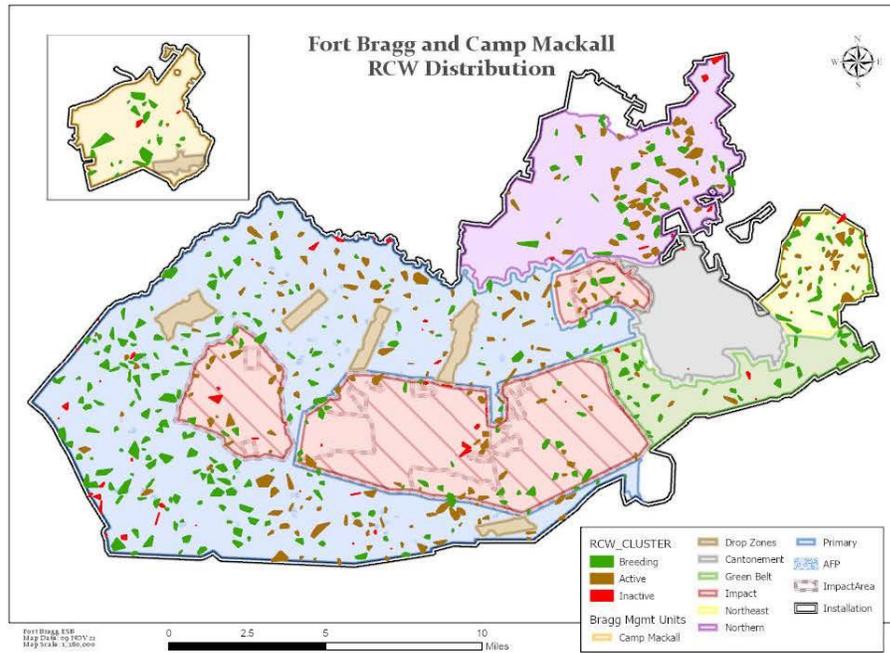


Table 1. Active Clusters and PBGs on Fort Bragg and Camp Mackall, 1998-2020.

Clusters not counted within #PBG	Sandhills East					Sandhills West	
	YEAR	Managed	# ACT	Fort Bragg #PBG	Partnership Lands	Camp Mackall	
						PBG	ACT
	1998		298	231	n/a	9	11
	1999		305/350 ^b	238	n/a	7	11
	2000		304/350 ^b	288 ^c	18	7	11
	2001		355	290	17	9	12
	2002		376	303	18	11	12
	2003		384	310	18	10	13
	2004	396	396	322	18	10	12
	2005	429	414	347	21	13	14
	2006	438	419	365	22	12	14
279	2007	448	436 ^d	371	20	13	14
279	2008	452	442	374	21	13	13
65 ^e ;279	2009	456	442	389	21	11	13
65;279	2010	461	450	396	20	10	12
184;279	2011	467	456	402	21	12	13
184;65	2012	472	461	405	22	11	14
276;184;65;298	2013	483	471	413	22	14	15
	2014	490	483	424	23	14	14
	2015	493	488	431	23	14	15
	2016	501	493	434	24	14	15
	2017	510	504	445	26	15	16
	2018	518	515	453	29	15	16
	2019	524	518	458	33	16	17
	2020	528	521	461	33	19	19

^aActive clusters and PBGs estimated for Fort Bragg and known for Camp Mackall.

^bIndicates increase in active clusters due to Overhills purchase (1998).

^cIndicates increase in PBGs to include Overhills (2000).

^dIncludes cluster 279.

^eExcludes cluster 279.

The 2003 RCW Recovery Plan outlines individual recovery units. For each recovery unit, population goals are identified. Recovery unit goals are expressed as the number of PBGs required at the time of delisting. PBGs are defined as an adult male and adult female that occupy the same cluster, whether or not they attempt nesting or fledge young. Fort Bragg's population comprises most of the Sandhills East Primary Core Population, which is one of two primary core populations in the Sandhills Recovery Unit (Fort Benning is the other). Camp Mackall comprises part of the Sandhills West Essential Support Population. The 2003 RCW Recovery Plan established a population goal of 350 PBGs for the Sandhills East population.

The 2007 Army RCW Guidelines require the establishment of clear installation population goals in accordance with the recovery unit population goals established in the 2003 RCW Recovery Plan (Dept. of the Army, 2007). The guidelines also instruct installations that have achieved population goals to continue proactive management and the establishment of recruitment clusters to achieve habitat carrying capacity consistent with mission requirements. Fort Bragg has established goals at the installation level to facilitate management for habitat carrying capacity. Installation goals consider all RCW clusters, including inactive clusters and those occupied by a solitary male or female.

In the Fall of 2007, 448 actively managed RCW clusters were identified on Fort Bragg. Some of these were recruitment clusters, while others were a result of budding or pioneering. In addition to the actively managed clusters, the 1997 ESMP installation goal included 42 planned recruitment clusters that had yet to be established. These additional planned recruitment clusters included 39 recruitment clusters on the NTA and three recruitment clusters on the Overhills tract. These planned recruitment clusters increased the Fort Bragg population goal to 489 managed clusters. Fort Bragg contains areas of unoccupied suitable habitat that could support additional RCW groups. Additional RCW groups could enhance Fort Bragg's ability to maintain the population at recovery levels by providing critical demographic connectivity. Fort Bragg contains 105,629 acres of potentially suitable habitat. Prior to 2011, biologists evaluated 45 sites on Fort Bragg for recruitment potential using 200 acres of potentially suitable habitat as minimum requirement for suitability. This evaluation identified 19 of 45 sites as suitable for recruitment, and these additional recruitment sites brought Fort Bragg's total cluster-level population goal to 517 clusters. A more recent review (Nov 2016) of the population goal taking newly budded and pioneered clusters into account over the past five years has brought the population goal to a total of 547. The installation population goal is not a static goal and may increase or decrease in response to RCW budding or pioneering and changes in the habitat carrying capacity.

Stability and growth of the Camp Mackall population are also important as a component of the Sandhills West Essential Support Population. In recognition of the importance of this support population, biologists and military trainers agreed to consider the long-term management of 18 clusters, including four recruitment clusters, on Camp Mackall. In 2013, a pioneered cluster on Camp Mackall increased the long-term population goal to 19 clusters, with three clusters slated as Future Recruitment Clusters.

Greenbelt Area, Northeast Area (NEA), and Northern Connector

The combination of Army development in the Main Cantonment Area (MCA) and private development to the north in Harnett County is gradually isolating RCW groups in Fort Bragg's NEA from the remainder of the Fort Bragg population. Consequently, the NEA is an area of concern for the RCW regarding genetic and demographic isolation. RCW groups in the NEA are currently connected to the remainder of the Fort Bragg population by a narrow corridor of fragmented habitat known as the Greenbelt, which runs along the southern and western boundaries of the MCA. The Greenbelt functions

as a forested corridor connecting approximately 40 RCW groups on the NEA with the remaining Fort Bragg population. Approximately 80 percent of the Greenbelt is composed of contiguous forested lands, while the remaining 20 percent is fragmented by roads, a golf course, power line right-of-ways, housing areas, and numerous other installation facilities. In 1992, the USFWS issued a Biological Opinion for a Greenbelt construction project that mandated the formulation of a plan for prioritizing habitat restoration and establishing occupied RCW clusters within this corridor (USFWS, 1992). Ensuing efforts to improve this demographic link included years of habitat improvements and translocations aimed at stabilizing and increasing the number of active clusters within the Greenbelt.

Increasing development pressure on the Greenbelt, and the Army's acquisition of the Overhills tract, led the North Carolina Sandhills Conservation Partnership (NCSCP) RCW Strategy Working Group to propose a northern connector. The northern connector would link RCW groups in the NEA with those occurring on the Overhills tract. Research indicates that the majority of dispersals from the NEA involve birds that have initially dispersed to the Overhills tract through the northern connector (Walters et al., 2004). Consequently, the northern connector is currently recognized as a critical link for maintaining demographic connectivity between the NEA and the remainder of Fort Bragg (Walters, 2005a). The Greenbelt continues to be a priority management area and efforts are also focused on the protection of forested lands between the NEA and the Overhills tract.

Impact Areas

The three largest impact areas (McPherson, Coleman, and MacRidge) are located in the central portion of Fort Bragg. Fort Bragg's impact areas and firing ranges contain approximately 85 active RCW clusters (Fort Bragg, Unpublished 2015 Activity Status Data). The interior portions of the two largest impact areas (McPherson and Coleman) are mostly devoid of mature trees; however, these impact areas contain quality peripheral habitat that is critically important for maintaining demographic connectivity of the overall population. The McPherson and Coleman impact areas contain a total of 48 active clusters. The remaining two impact areas on Fort Bragg (MacRidge and Manchester) contain a total of 37 active clusters in both peripheral and interior areas. Although some clusters within the interior portions of impact areas were historically color-banded, none are currently banded or intensively monitored.

The majority of the clusters in the MacRidge, McPherson, and Manchester impact areas are not accessible for intensive monitoring. Consequently, the number of PBGs in these areas cannot be estimated from the 30 percent sample that is used to estimate the number of PBGs elsewhere on Fort Bragg. However, an alternative method for estimating impact area PBGs was developed through a collaborative effort between RCW research biologists and a biological statistician (Pollock et al., 2001). Based on this method, 72 percent of the clusters that can be confirmed as active are counted as PBGs toward the recovery goal. In 2020, the number of clusters that were counted towards recovery included 12 in the MacRidge impact area, 16 in the McPherson impact area and 12 in the Manchester impact area. The number of accessible active clusters

in the Coleman impact area is sufficient to allow its inclusion in the overall 30 percent population sampling design. Therefore, the number of PBGs in the Coleman impact area can be estimated along with the overall Fort Bragg population.

Although researchers have developed a method for estimating the number of PBGs within inaccessible impact areas, the inclusion of these clusters in recovery-level population estimates requires access for activity status checks during the spring and habitat management activities during the fall. Access to these clusters is dependent on training activity and approval from Range Control. Range Control also provides guidance regarding high risk areas where access requires an Explosive Ordnance Disposal (EOD) escort. Breeding season access to RCW clusters is required to determine activity status, since biologists conduct most habitat management activities (including artificial cavity construction) during the fall post clean-up. During the nesting season, the collection of critical reproductive data from selected clusters requires early morning access to areas on or adjacent to ranges.

Significant portions of the impact areas and ranges are managed for the RCW. Habitat management activities include prescribed fire, herbicide treatments, and pine thinning. Prescribed fires are especially important for ecosystem management and as a means of reducing the potential for wildfires in these areas. Fort Bragg's prescribed fire program attempts to mimic the natural wildland fire regime by scheduling managed woodlands for implementation during the growing season on a one to three-year rotation. Approximately one-third of the installation is scheduled for prescribed burning each year. Site-specific fire prescriptions are prepared based on restoration status and habitat management objectives. Prescriptions include provisions to avoid adverse effects on overstory pines, endangered species habitats, and other significant habitat features. Habitat restoration and management within these areas are equally beneficial to the training mission.

b. Saint Francis' Satyr

Currently, the SFS butterfly is only known to exist on a few square miles of Fort Bragg with a large portion of the population located in restricted areas (Hall, 1993; Hall and Hoffman, 1994). Since 2002, SFS colonies located outside the restricted impact areas have been intensively monitored using mark-recapture and visual counts. Estimations for SFS populations outside the restricted area fluctuate between 200 and 1000 individuals (Haddad et al., 2007). Due to limited access, colonies located in restricted areas are not surveyed and current total population numbers are unknown.

c. Rough-leaved loosestrife

Rough-leaved loosestrife generally occurs on acidic, moist to seasonally saturated sands and shallow organic soils overlying sands, but also occurs on deep peat soils of low pocosins and Carolina bays. Rough-leaved loosestrife occurs most often along the ecotone between longleaf pine uplands and pond pine pocosins, but has also been found in longleaf pine flatwoods, Sandhill seeps, pond and lake margins, and ecotones between pocosins and longleaf pine savannas. Occurrences have also been

documented in disturbed habitats such as roadside depressions, firebreaks, and powerline easements (USFWS, 1995).

On Fort Bragg and Camp Mackall, there are 23 known sites within training areas and 37 known sites within impact areas. The majority of the training area sites are small, isolated occurrences that rarely flower; however, there are some larger occurrences within powerline easements. Occurrences in the three major impact areas range in size from a few to several thousand stems, with the largest sites located along dendritic stream systems. Significantly large occurrences are located along Bones Creek and Little Rockfish Creek in the MacRidge Impact area and Rays Creek in the Coleman impact area.

d. Michaux's sumac

Michaux's sumac typically grows in sandy or rocky, open woods in association with basic soils (USFWS, 2008). In the Sandhills, populations typically occur in submesic, loamy swales. Michaux's sumac is shade intolerant and grows best in habitats that are maintained by disturbance. All of its former habitats were probably maintained by fire, and many of the extant populations occur on roadsides, power line easements, and other artificially maintained clearings.

On Fort Bragg and Camp Mackall, typical natural habitats include pine/scrub oak sandhill loamy soil variant and pine/scrub oak sandhill blackjack-mixed oak variant communities (Schafale and Weakley, 1990). Other habitats on Fort Bragg and Camp Mackall include small wildlife food plots, forest clear-cuts, abandoned building sites, and sparse to moderately dense pine or pine/hardwood forests. Currently there are 11 known sites of Michaux's sumac on Fort Bragg and 11 known sites on Camp Mackall, with individual sites ranging in size from 10 to >1000 stems.

e. American chaffseed

American chaffseed typically grows in sandy (sandy peat, sandy loam), acidic, and seasonally moist to dry soils. American chaffseed is a shade-intolerant species that depends on fire or other forms of disturbance to maintain open conditions. It is generally found in fire-maintained habitats such as moist pine flatwoods, pine/wiregrass savannas, and ecotonal areas between peaty wetlands and xeric sandy soils. Habitats typically have a diverse, species-rich herbaceous stratum comprised of grasses, sedges, and forbs (USFWS, 1995). In North Carolina, natural communities that represent suitable habitat include mesic pine flatwoods, pine/scrub oak sandhill, pine savanna, and Sandhill seep (Schafale and Weakley, 1990).

There are 19 extant occurrences in North Carolina, 17 of which occur on Fort Bragg. Due to the high frequency of fires, the impact areas support large occurrences of American chaffseed. These large occurrences establish Fort Bragg as one of three major population centers along with eastern South Carolina and southwestern Georgia/northwestern Florida. Occurrences outside of the impact areas, where burns are less frequent, are limited to five sites with low numbers of individuals. **Table 2**

shows individual plant counts from 2012-2021 for the sites outside of the impact areas where more intense surveys can occur.

Table 2. Individual Plant Counts of American Chaffseed (*Schwalbea americana*)

ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SCAM021A	0	0	0	0	0	0	0	0	0	0
SCAM023A	67	56	59	40	42	23	52	19	12	8
SCAM024A	0	0	0	0	0	0	0	0	0	0
SCAM025A	3	6	4	4	3	1	1	0	0	0
SCAM025B	10	7	5	6	6	0	0	0	0	0
Totals	80	69	68	50	51	24	53	19	12	8

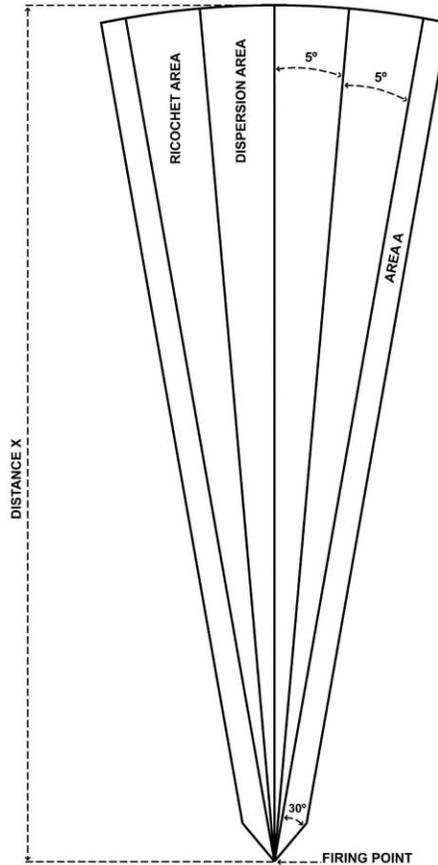
6. Methodology

a. Overview

The MPTR project was assessed and evaluated to determine direct or indirect impacts on five federally listed species (RCW, Saint Francis' satyr, Rough-leaved loosestrife, Michaux's sumac, and American chaffseed) occurring within the Action Area. Cumulative impacts were determined and assessed for each species accordingly. Habitat analysis and habitat evaluations were performed through field surveys and geographic information system (GIS) using ArcMap.

Project impacts were determined using the clearing limits of the range footprint and the area downrange where live operations could potentially impact RCW forage and cavity trees within the surface danger zone (SDZ). The SDZ is a depiction of the mathematically predicted area a projectile will return to earth either by direct fire or by ricochet. SDZs are built on the assumption that 99% of the rounds fired will remain in the direct firing line (DFL). For the purpose of this biological assessment, the DFL was determined to be the area outside the range footprint where munitions could travel from the firing position to target position and beyond and have impact on RCW habitat. The maximum effective range or the maximum distance a projectile is expected to cause damage was determined to be 1800 meters. This is based on the ballistics of munitions that are expected to be fired with the frequency, duration, and intensity to cause damage downrange. The Dispersion Area (DA) within the SDZ is located between the DFL and the ricochet area (RA) (**Figure 8**). The DA accounts for human error, gun or cannon tube wear, propellant temperature, and so forth. For the purpose of this biological assessment, the DA for impact to RCW trees was determined to be five degrees to each side of the DFL.

Figure 8. SDZ for Small Arms Direct-Fire Weapons



Live fire impacts to RCW trees and habitat are anticipated only in the DFL and DA portions of the SDZ with the highest probability of direct impacts to occur within the DFL. Over time, the DFL zone is expected to lose some of the existing forest from live fire activities with trees remaining between firing lanes, at farther distances from the firing points and within areas spared from impacts due to topography. However, so as not to underestimate impacts, this assessment is analyzing direct impacts to RCW cavity trees and habitat using a “worse case” scenario and assumes all suitable habitat within the DFL will be lost.

The project area was surveyed for endangered plants to determine presence or absence for each species and their suitable habitats (Appendix 1). Forest stands were surveyed for RCW cavity and start trees. In accordance with the “Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker (*Dryobates borealis*) Recovery Plan: *Second*

Revision", a forage habitat analyses (FHA) was conducted for project-related impacts to each RCW cluster.

In addition to running a FHA, the projects were assessed for non-forage related impacts. For example, project-related impacts to nesting habitat, amount of fragmentation, RCW harassment/disturbance, *etc.* were considered. These issues were evaluated and assessed for each of the impacted clusters/groups on a case-by-case basis.

b. Forage Habitat Analysis (FHA)

RCW forage area was determined using GIS to create forage partitions based on previous foraging guidelines that all foraging habitat be allocated within 0.5 miles of the center of the cluster. This technique creates Thiessen polygons from the epicenter of each cluster, and then applying tabular data of stand characteristics to determine availability of foraging habitat within each partition. Where foraging circles overlap, the habitat is divided up equally among clusters. If a partition has no overlap, it is extended out to a 0.5-mile radius circle, unrestrained (Henry, 1989). The revised partition development method was created by Lipscomb in the early 1990s and takes into account the complication of allocating forage area for overlapping forage partitions (Lipscomb and Williams, 1996, 1998).

The RCW Foraging Matrix Application (Matrix) was used to conduct an analysis to determine quantity and quality of forage habitat pre-project and post-project (USFWS, 2005). The Matrix evaluated the overall quality and quantity of forage stands within the partition/s. The FHA evaluated project impacts in relation to the two forage habitat standards: the Standard for Managed Stability (SMS) and Recovery Standard (RS). SMS defines the minimum foraging habitat requirements considered necessary to avoid foraging habitat-related incidental take. If a partition will not meet SMS, a determination of "is likely to adversely affect" will normally be made and incidental take will be warranted. In very rare circumstances, and on a case-by-case basis with the support of local demographic data, a "not likely to adversely affect" may be determined for forage partitions that currently do not meet the SMS or are currently above but will go below the SMS. RS defines foraging habitat requirements considered necessary to meet or retain recovery within an individual population.

In particular, the Matrix determined if the RS requirement of 120 acres of contiguous 30+ year old pine stands, Potential Good Quality Forage Habitat (PGQFH), is met pre- and post-project. Additionally, the analysis determined if the SMS requirement is met, partitions are required to have a minimum of 75 acres of suitable foraging habitat for pine stands > 30 years of age and > 3,000 square feet (ft²) of basal area (ba) for pine trees > 10-inch diameter at breast height (dbh).

The Matrix analysis assessed several habitat-related parameters that affect RCW demographics (*e.g.*, neighborhood dynamics), group fitness (*e.g.*, reproduction, group size, and adult survival), and dispersal. Stand-level characteristics assessed by the Matrix program include but are not limited to:

- Stand age
- Average pine ba > 10-inch dbh between 40 and 70 ft²/ac
- Average pine ba for 10-inch dbh pines < 20 ft²/ac
- Total ba of all pines > 10-inch dbh with a minimum of 40 ft²/ac
- Overstory hardwood canopy percent <10%, < 80 ft²/ac
- More than 18 stems/ac of pines > 60 years of age and 14-inch dbh with minimum ba of 20 ft²/ac
- BA of pines between 10- and 14-inch dbh is between 0 and 40 ft²/ac
- Preferable that 50% or more of this habitat lies within the 0.25 mile area
- 40% or more herbaceous ground cover
- No hardwood midstory persists and is not to exceed height (<7 ft) and sparse density
- Frequent growing season fire return interval and season of last prescribed burn, *etc.*

All of this information was used collectively to formulate a FHA summary (**Table 3**). The Matrix totals were summarized and the overall suitability and quality of stand scores and values in the RS and SMS were determined through various reports. Some examples of partition level characteristics assessed in the Matrix include: available total acres of foraging habitat (*i.e.*, good quality vs. potential), total acres of pines > 30 years of age, number of contiguous acres, total partition score, *etc.*

Since the SMS and RS do not consider fragmentation effects to surrounding clusters, which relates to demographics and surrounding group fitness, *etc.*, careful consideration was given to fragmentation issues within the group and neighborhood level analyses. Project impacts were evaluated for potential impacts to surrounding group fitness and demographics.

c. Group Level Analysis (GLA)

GLA involves examining a project's impact on the demographic health of a group. As such, overall total quality and quantity of foraging habitat post-project are important, as well as issues of group isolation, forest fragmentation, group fitness, *etc.*

Project impacts were examined on group fitness (e.g. reproductive success, group size, adult survival) which relates, in part, to quality and quantity of foraging habitat (Engstom and Sanders, 1997; Hardesty *et al.*, 1997; James *et al.*, 1997, 2001; and Walters *et al.*, 2000, 2002a). It is recognized that there is a correlation between RCW group fitness and stand integrity (structure, quantity, and quality) of available forage. This relationship is confirmed by the fact that as foraging habitat quality increases, the group home range decreases (Engstom and Sanders, 1997).

Since habitat quality ultimately affects group demographics, stand configuration, or remaining suitable habitat was evaluated post-project. This analysis identifies whether partitions affected by the project will meet the managed stability standard, recovery standard, or somewhere in between. Stand contiguity was considered to assess degree of group isolation. If affected groups will be isolated post-project, a determination of "is

likely to adversely affect” and incidental take may be warranted. Also, since isolation affects group fitness, it is believed that a certain density of groups is considered necessary to maintain demographic health. To date, most studies have evaluated group fitness based on the number of groups within 1.25 miles of the project area or target group (Conner and Rudolph, 1991; Hooper and Lennartz, 1995; Crowder *et al.*, 1998).

Group fitness is also interrelated and interdependent with demographics. The ability of dispersing birds to locate potential breeding vacancies, to achieve helper status, or to replace a lost bird in a group is very important to group stability. As such, project impacts were closely evaluated and assessed for fragmentation of nearby adjacent groups. The project impacts were analyzed based on size, location, and juxtaposition.

Typically, negligible habitat loss in an occupied cluster or unoccupied habitat would result in a “No Effect” determination. However, a “Likely to Adversely Affect” determination may be warranted if such habitat loss could demonstrate indirect adverse effects on nearby groups. This concern is especially important in areas where group density is precariously low.

d. Neighborhood Level Analysis (NLA)

Demographic viability of groups, neighborhoods, and populations is primarily dependent of the ability for group members to disperse. Neighborhood groups are those groups not directly impacted by the project, but which occur adjacent to, or within the population’s mean dispersal distance of groups that are directly affected by the project. A neighborhood analysis is typically warranted when a partition level or group level analysis concludes a “Likely to Adversely Affect” determination. The status, size and reproduction of neighborhood groups may be affected if dispersal opportunities are limited or inhibited by a project, even if adequate foraging habitat remains post-project for individual groups. Neighborhood analyses provide further information on whether a population may or may not be able to reach its population goal.

RCW dispersal distances and social, environmental, and genetic factors affecting dispersal have been evaluated most extensively by data from long-term studies of a virtually completely banded population in the North Carolina Sandhills and Marine Corps Base Camp Lejeune (e.g. Walters *et al.*, 1988; Walters *et al.*, 1992; Daniels and Walters, 2000; Pasinelli and Walters, 2002; Pasinelli *et al.*, 2004; Kesler *et al.*, 2010). Female juvenile RCWs disperse following extraterritorial forays from their natal territory to explore and interact with other groups, with maximum foray distances from 6-9 km (3.7 – 5.6 mi) (Kesler *et al.*, 2010). Overall, median dispersal distances of juvenile males and helper males are lesser. The 6 km (3.7 mi) distance is the 95% percentile of all observed juvenile female forays by Kesler *et al.* (2010).

Although neighborhood size can vary by project, this biological assessment will assess RCW groups at the neighborhood level that occur within 3.7 miles of groups directly affect by the proposed action.

e. Population Level Analysis (PLA)

A PLA assesses whether a “Likely to Adversely Affect” determination and associated anticipated loss of groups (based on foraging partition, group, and/or neighborhood analyses) that will potentially result in the population’s inability to meet its recovery goal (USFWS, 2005). This determination can be made if demographics of surrounding clusters are disrupted post-project from fragmentation (Conner and Rudolph, 1991). If population specific density and its relationship to group demographic health are minimally affected or impacted from the project, then the determination at the population level will warrant a “Not Likely to Adversely Affect” determination. If the impacts are severe they may warrant a “Likely to Adversely Affect” determination. If forage partition deficiencies or group isolation affects neighboring group demographics then populations may have an inability to meet or sustain their recovery goal (Dept. of the Army, 2019; USFWS, 2005). Under this scenario, the RCW population could be in jeopardy.

f. Additional Surveys

(1) RCW

Forest stands within the proposed project area were surveyed for RCW cavity and start trees in 2019. A re-survey of the entire Sandy Grove Training Area Group (TAG) will occur over the next two years prior to construction of the MPTR.

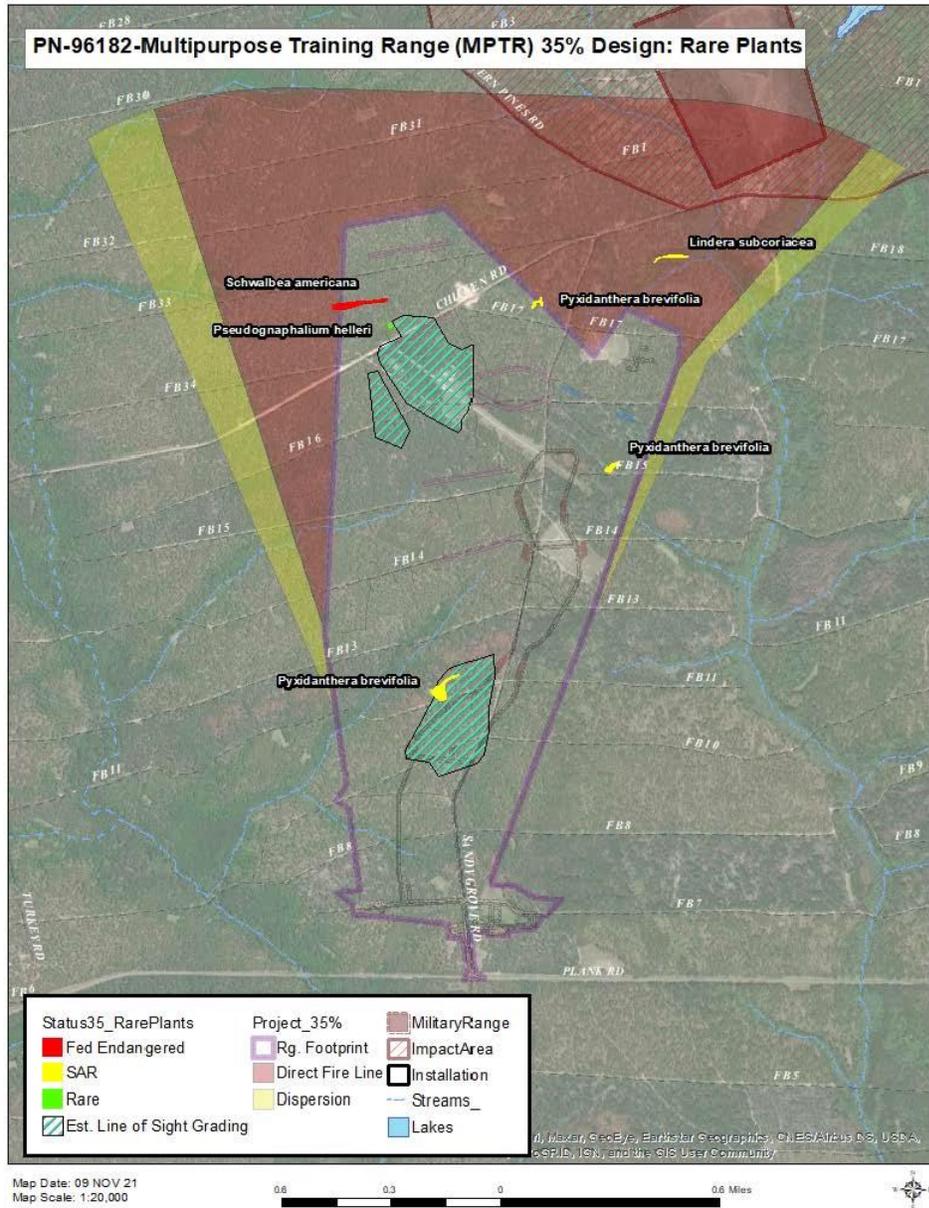
(2) Saint Francis' Satyr

There are no documented occurrences of Saint Francis' Satyr within the project area (Hall, 1993). A field evaluation determined no suitable habitat for SFS occurs in the project area.

(3) Rare Flora

A rare plant survey within the MPTR footprint was completed in 2021 (**Figure 9**). The survey documented the presence/absence of the following federally protected plant species listed by the USFWS: Rough-leaved loosestrife, *Lysimachia asperulifolia*; American chaffseed, *Schwalbea americana*; Pondberry, *Lindera melissifolia*; and Michaux's sumac, *Rhus michauxii*. In addition, the following Army Species at Risk (SAR) species were also surveyed: Georgia leadplant; *Amorpha georgiana* var. *georgiana*; Sandhills milkvetch, *Astragalus michauxii*; Pickering's dawnflower, *Stylisma pickeringii* var. *pickeringii*; Sandhills pyxie moss, *Pyxidantha brevifolia*; bog spicebush, *Lindera subcoriacea*; and Sandhills lily, *Lilium pyrophilum*. The survey documented multiple occurrences of Army SAR species and verified the one occurrence of American chaffseed, *Schwalbea americana* within the project area. There is no potentially suitable habitat for pondberry, Michaux's sumac, and Rough-leaved loosestrife within the project footprint. American chaffseed has limited suitable habitat with one known plant site within the project area (Appendix 1).

Figure 9. Rare Plants



7. Analysis of Effects

Under section 7 (a)(2) of the ESA, “effects of the action” refers to direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. Under section 7, the federal agency is responsible for analyzing these effects. The effects of the proposed projects are added to the environmental baseline to determine the future baseline.

This section of the assessment will analyze the direct and indirect effects (beneficial and adverse) to federally protected species from the proposed project. Direct impacts will occur from the clearing, grading and grubbing for range construction and from range operation specifically habitat loss due to munitions. The operation of the new MPTR from live fire will likely cause direct impacts to RCW cavity/start trees within the DFL and DA of the SDZ.

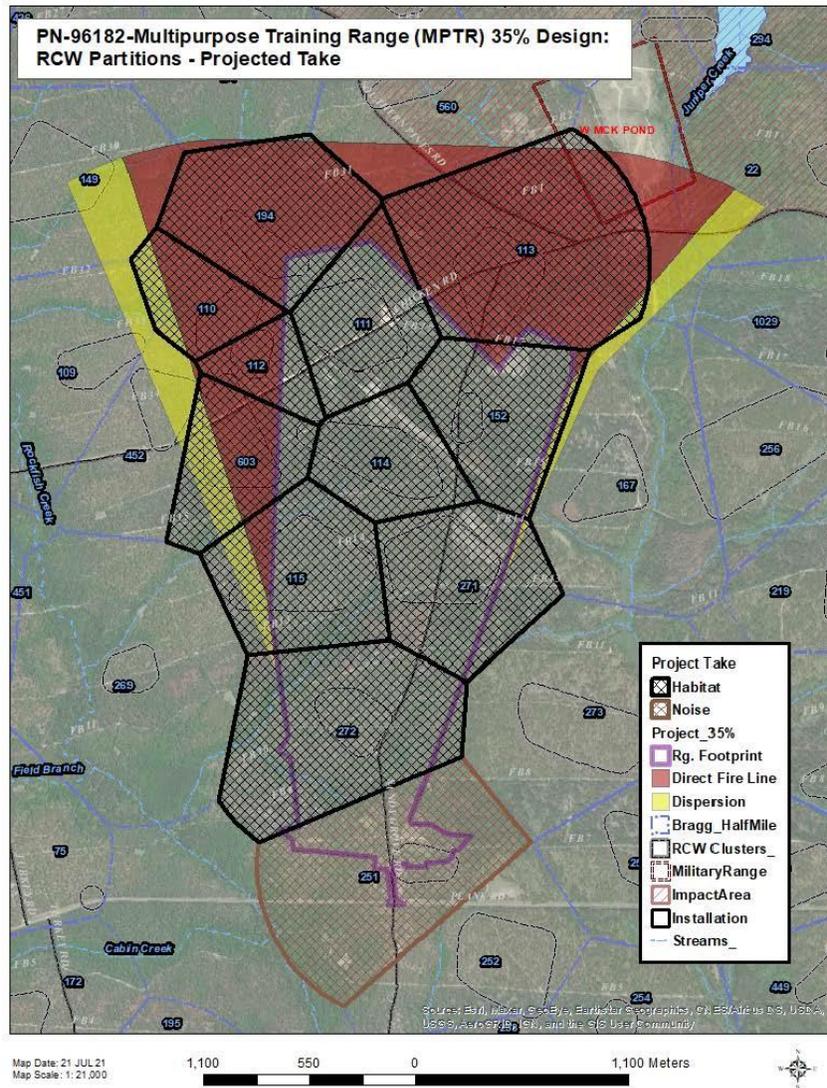
Direct and Indirect Effects

a. RCW

Forage Habitat Analysis

Direct impacts to managed RCW groups will occur primarily from range construction and range operation. Direct impacts were determined using the clearing limits of the range footprint and the area downrange where live operations could potentially impact RCW forage within the SDZ. The direct impacts assessment determined that 18 RCW Clusters will be impacted from the construction and operation of the MPTR. Eleven of the 18 clusters (clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272 and 603) will be directly impacted and incur substantial loss to forage habitat as a result of clearing or direct fire impacts (**Figure 10**). These clusters will not meet the minimum SMS of 75 acres of suitable foraging habitat for pine stands > 30 years of age and > 3,000 square feet (ft²) of basal area (ba) for pine trees > 10-inch diameter at breast height (dbh). The significant loss of forage habitat would likely adversely affect or “take” these clusters.

Figure 10. RCW Cluster Projected Take



A conservative approach toward assessing forage related impacts from range operation was taken so not to underestimate potential forage loss over time; therefore all habitat within the DFL (from the firing position to target position and 1800 meters beyond) was calculated assuming that, most if not all forage within this zone would eventually be lost. Direct impacts to forage from munitions within the DA are anticipated to be minimal or insignificant based on the fact that 99% of the impacts from munitions are anticipated to occur within the DFL. Therefore, forage habitat within the DA is anticipated to remain structurally intact and was not counted within the analysis to be lost. Six additional clusters (clusters 22, 149, 151, 167, 251, and 560) will incur some loss of forage habitat but will retain >120 acres of PGQFH post-project. In addition, cluster 452 will retain <120 acres of PGQFH (108.6 acres) but will incur minimal forage loss (0.7%) post-project. **Table 3** summarizes the forage habitat analysis for each of the 18 RCW clusters and provides the pre-project PGQFH and the post-project PGQFH based on impacts from range construction and direct fire. RCW forage assessment reports for the 18 RCW clusters will be provided electronically as Appendix 2.

Table 3. FHA Summary

Project Area	Partition #	Status	PGQFH Pre-Project	Project Removal (PGQFH) Range & DFL	% Removal	PGQFH Post-Project
Direct Fire	22	ACT	275.19	0	0.0%	275.19
Range/Direct	110	ACT	68.13	53.93	79.2%	14.2
Range/Direct	111	BRE	108.22	108.22	100.0%	0
Range/Direct	112	BRE	45.92	45.92	100.0%	0
Range/Direct	113	BRE	207.21	205	98.9%	2.21
Range	114	BRE	82.86	82.86	100.0%	0
Range/Direct	115	BRE	153.81	118.44	77.0%	35.37
Direct Fire	149	BRE	225.56	16.57	7.3%	208.99
Direct Fire	151	BRE	197.91	1.3	0.7%	196.61
Range/Direct	152	BRE	121.02	112.24	92.7%	8.78
Direct Fire	167	BRE	209.69	1.1	0.5%	208.59
Range/Direct	194	BRE	157.88	156.81	99.3%	1.07
Range	251	BRE	209.33	47.54	22.7%	161.79
Range	271	BRE	143.62	103.56	72.1%	40.06
Range	272	BRE	233.11	165.94	71.2%	67.17
Direct Fire	452	BRE	109.33	0.73	0.7%	108.6
Direct Fire	560	ACT	168.49	33.31	19.8%	135.18
Range/Direct	603*	BRE*	105.72	63.22	59.8%	42.5
*2021 Data		18				
Total: Acres			2,823.00	1,316.69	46.6%	1,506.31
						1,506.31

Post Acres		
Clusters > 120	6	
Clusters > 75 < 120	1	
Clusters < 75	11	
	1	Habitat Harassment / Noise

TAKE

RCW Cavity Trees

Direct Impacts to RCW cavity trees will occur with range construction and direct fire impacts from munitions primarily within the DFL. However, as a conservative approach and as a precaution not to underestimate possible loss of an active cavity tree, all RCW cavity trees with the DA will be considered lost from live fire activities. **Figure 11** shows the extent of RCW cavity trees within the range footprint, the DFL, and the DA that will be lost from the construction and operation of the MPTR. This assessment has determined that the majority of the cavity trees within 11 RCW clusters (clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272 and 603) will be lost from the clearing and operation of the MPTR. 84 cavity trees within eight RCW clusters will be lost from clearing within the range footprint. 63 cavity trees are anticipated to be lost within six clusters from the direct firing of munitions over time. In addition, two inactive cavity trees within cluster 149, one advanced start tree within cluster 603, one start tree within cluster 452 and one tree no longer managed are anticipated to be lost within the DA. Four cavity trees within cluster 251 will be lost from the clearing of the range. Of the four cavity trees, one has an active, suitable cavity. The other three cavity trees are unsuitable (one relic, one inactive, enlarged cavity and one active, sub- start). Clusters 149, 452, and 251 will retain enough suitable cavities for viable roosting and nesting. **Table 4** summarizes the direct impacts to RCW cavity trees for each cluster within the associated project impact area.

Figure 11. RCW Cavity Trees Lost

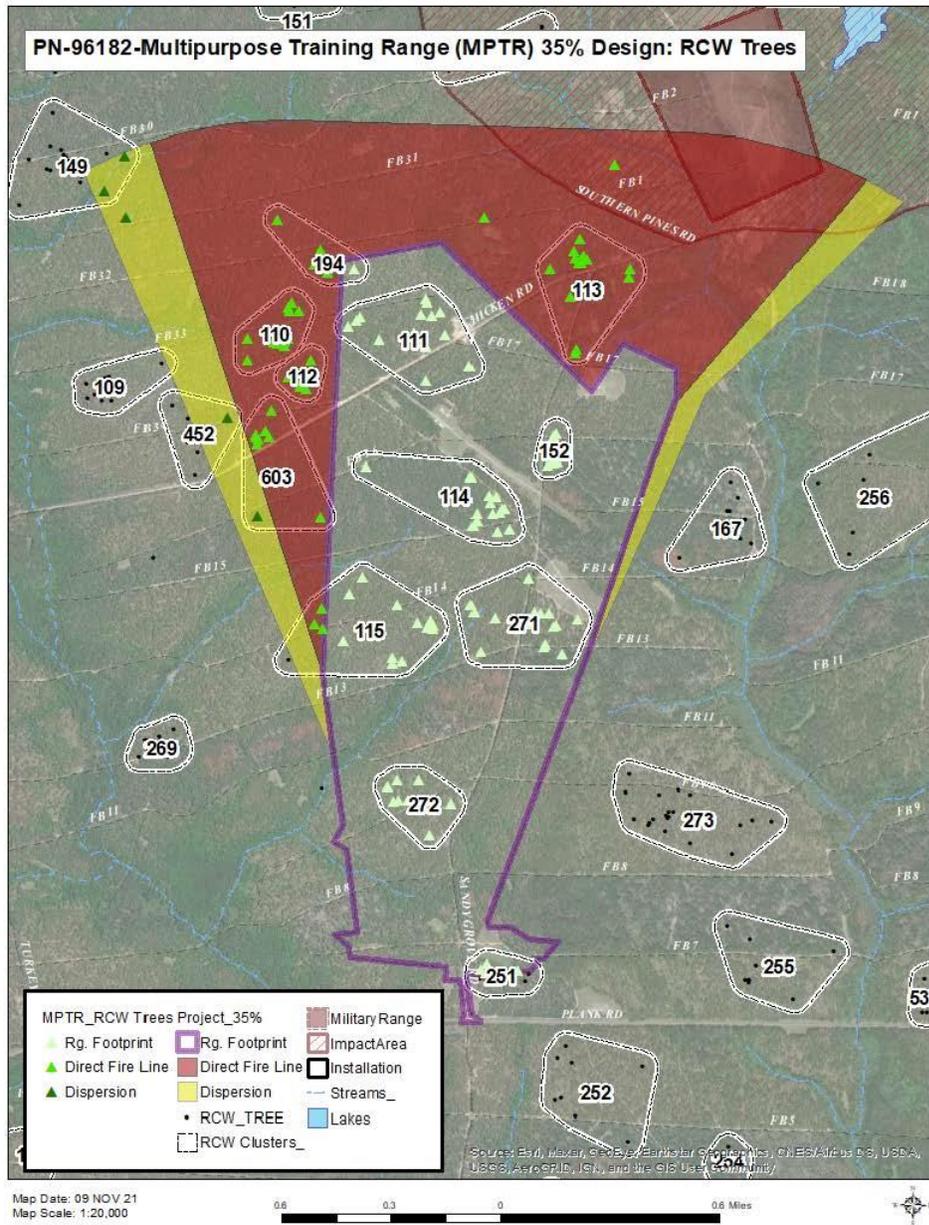


Table 4. RCW Cavity Tree Analysis

Range Clearing													
Cluster: Total Trees	Cluster #	Tree #											
17	111	2597	2598	2600	5078	5080	5090	5450	9105	9916	10289	11520	11521
# Impacted	17	12760	18208	1946E	1990E	2672E							
% Removal	100.0%												
16	114	0209E	0210E	2795	3400	4666	5430	5431	5432	9047	9109	9264	9995
# Impacted	16	18071	2842E	3202E	3203E								
% Removal	100.0%												
17	115	2801	2811	2814	6556	9450	9947	9976	11901	12843	1625E	1626E	1627E
# Impacted	13	2827E											
% Removal	76.5%												
9	152	9491	9492	9909	9977	10705	12888	2349E	2350E	2399E			
# Impacted	9												
% Removal	100.0%												
13	194	18292											
# Impacted	1												
% Removal	7.7%												
12	251	2774	3618	4618	14500								
# Impacted	4												
% Removal	33.3%												
15	271	0182E	0184E	2803	2804	2805	2806	2807	2808	5048	12724	14820	18004
# Impacted	15	2728E	2825E	2826E									
% Removal	100.0%												
9	272	2765	2766	3048	4620	4642	12838	18003	2425E	2449E			
# Impacted	9												
% Removal	100.0%												

Direct Firing Line													
Cluster: Total Trees	Cluster #	Tree #											
19	110	198E	2609	2610	2611	3613	5002	5079	9110	9234	9479	9910	9952
# Impacted	19	9983	1734E	1735E	18209	2003E	3063E	3064E					
% Removal	100.0%												
5	112	5073	5074	9233	18212	18213							
# Impacted	5												
% Removal	100.0%												
12	113	2794	4650	5050	9266	12139	12803	1415E	18079	1818E	18207	1989E	2147E
# Impacted	12												
% Removal	100.0%												
17	115	18242	18243	18244									
# Impacted	3												
% Removal	5.9%												
13	194	2615	2617	9235	9918	1156E	1157E	12733	1392E	1393E	18293	2671E	2727E
# Impacted	12												
% Removal	92.3%												
9	603	2593	2594	2596	5486	9997	1947E	2828E	2829E				
# Impacted	8												
% Removal	88.9%												
Not Mngd	2500	2601	2618	2793	3649								
# Impacted	4												
% Removal	N/A												

Dispersion			
Cluster: Total Trees	Cluster #	Tree #	
14	603	9086	
# Impacted	1		
% Removal	7.1%		
16	149	2622	2832
# Impacted	2		
% Removal	6.3%		
13	452	12753	
# Impacted	1		
% Removal	7.7%		
Not Mngd	2500	2621	
# Impacted	1		
% Removal	N/A		

Construction and Operations Noise / Harassment

The use of heavy equipment, increased traffic on infrequently used road and an increase in human activity from timber clearing operations and project construction could have a “harassment” impact on RCW groups in the area (Delaney et al., 2002, 2004; Hayden et al., 2002; Walters et al., 2005b; Perkins, 2006). This is of particular concern if active RCW cavity trees occur within 200 ft. of the activity, especially during the nesting season. Disturbance around cavity trees can cause RCWs to flush from their cavities and, if the disturbance continues or there is insufficient daylight, to open-roost. This leaves RCWs unprotected from environmental hazards such as inclement weather and predators. Disturbances can also result in increased flushing while incubating eggs and reduced brooding and feeding of nestlings, which can lead to nest failure (Delaney et al., 2004; USFWS, 2003, 2006; J. Walters, NC State University, unpublished report). Clusters with active cavity trees within 200 feet of project construction limits or range operations areas were assessed for harassment impacts.

During construction phase of the project, there will be noise created from vehicles, contractors, and heavy machinery within the range footprint or limits of clearing. Noise related impacts will vary in intensity, frequency and duration and will depend on the type of activity. The majority of noise impacts from construction would occur to RCW groups within the range clearing limits or within close proximity. RCW clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272 and 603 will be lost due to significant forage habitat loss and/or cavity tree loss. RCW clusters 167, 273 and 251 are the only other clusters that would be in close proximity that potentially could be affected by noise or harassment. Cavity trees within clusters 167 and 273, located east of the MPTR footprint, are over 1,000 feet from the construction limits with the exception of one tree within cluster 167 which is approximately 800 feet away. Cluster 251 located on the southern portion of the MPTR is the closest cluster where noise/harassment impacts from construction and operations could potentially occur (**Figure 12**). Three cavity trees within cluster 251 will be lost from clearing. The remaining cavity trees within the core cluster are located outside of the project clearing limits but are all less than 200 feet from construction activities and range operations.

During the operation phase of the MPTR, there will be noise created from vehicles and live fire training activities. Vehicle operational noise is expected to range from approximately 90 decibels (dB) at idle to 120dB at full operational velocity. Live fire exercises will generate impulse noise. The MPF's main cannon is expected to generate Sound Pressure Levels (SPLs) up to 180dB at ignition with an equal SPL at impact downrange. The smaller-caliber coaxial weapons are expected to generate SPLs up to 165dBs.

The response of RCWs to different types and levels of noise has been investigated in two studies: Doresky et al. (2001) at Fort Benning and Delaney et al. (2002, 2004) at Fort Stewart. Doresky et al. (2001) recorded noise and vibration levels at treatment clusters (clusters adjacent to in or close proximity to significant noise sources, e.g., firing of small arms and artillery) and control clusters (clusters free of military

disturbance). Details of this study are provided in the above citation and incorporated herein by reference. No significant differences were found between treatment and control clusters for number of eggs, nestlings or adults, mass of nestlings, or return rates of adults feeding nestlings. Based on these findings, Doresky et al. (2001) concluded: (1) military activity had no significant effect on the reproductive success of RCWs, and (2) the RCW is apparently adaptable to the type and duration of the disturbances monitored.

Noise sources evaluated during the Delaney et al. (2002) study included: artillery simulators, .50-caliber blank fire, large-caliber live fire, small-arms live fire, grenade simulators, and helicopters. Anecdotal observations of RCW response to other types of military noise, including vehicle maneuver training, aircraft flights, MLRS fire, and Stinger/Drone Missile fire, were also recorded. RCW response was evaluated using demographic (e.g., number of young fledged) and behavioral (e.g., flushing response and return to nest time) data.

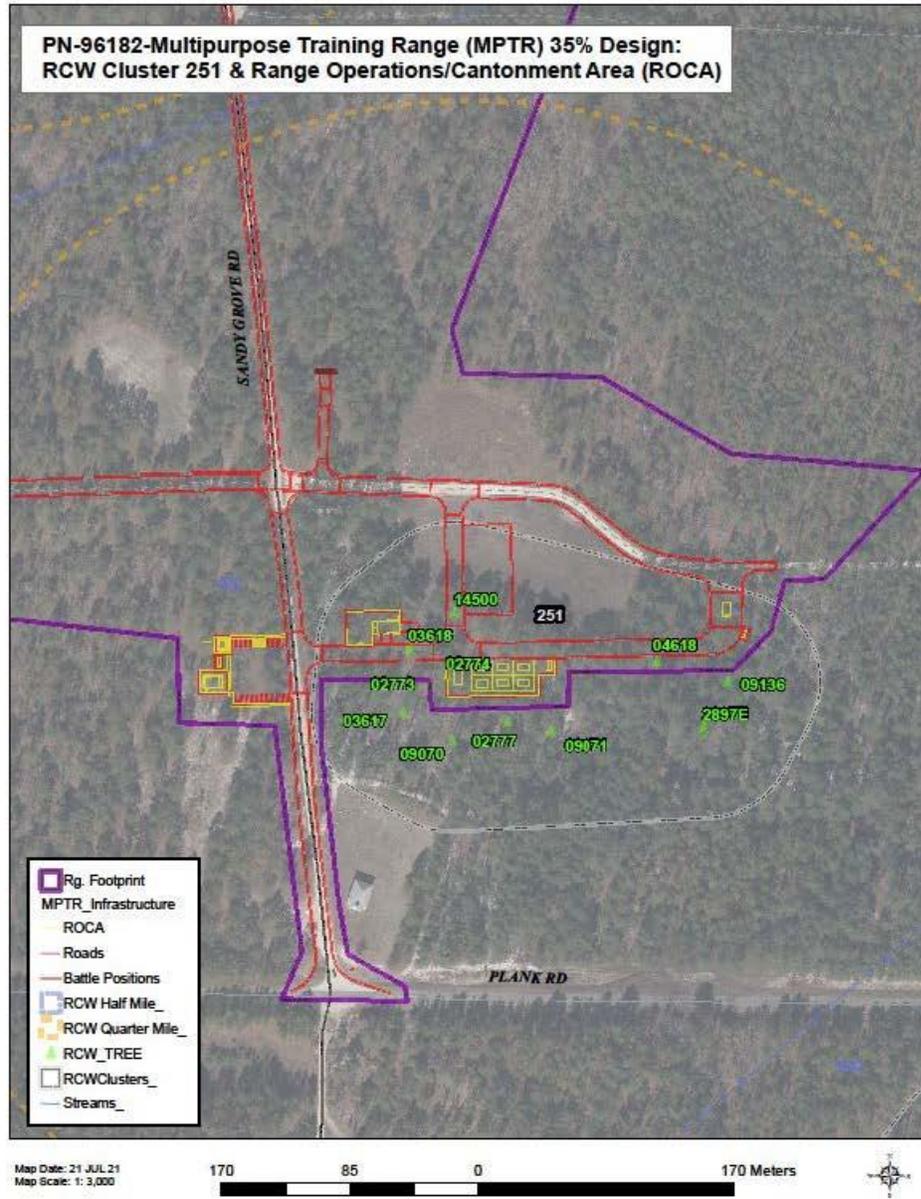
Delaney et al. (2002, 2004) found no significant differences in nesting success or number of young fledged between control and treatment groups for the level (i.e., noise levels, stimulus distances, and frequency of noise events) and types of noise sources tested. However, as distance of noise stimulus decreased, flush frequency increased for some noise stimuli. No flushing occurred when stimulus was beyond 152 m (498 ft). Post-flushing, RCWs returned to their nests, on average, within 4.4 minutes (16.2 min max) (artillery simulators) and 6.3 min (26.8 min max) (.50 caliber fire). In spite of increased flushing response, no nests were abandoned and "disturbed" (via noise) groups had similar fitness rates as undisturbed groups. In summary, Delaney et al. (2002) concluded "...that infrequent, short duration (less than two hours) military training exercises [resulting in noise] that are in close proximity to active RCW nest sites will not significantly impact RCW fitness rates on military installations."

Based on the current design layout of the MPTR, the closest point along the course road or battle position where live firing will occur is approximately 700 ft from the nearest cavity tree within RCW cluster 251. The closest point along the course road or battle position where live firing will occur from the nearest cavity tree within RCW clusters 167 and 273 is approximately 1,700 ft and 1,800 ft respectively. Noise or harassment impacts are not anticipated in clusters 167 and 273 due to extended distances from cavity trees to the construction and operation activities within the MPTR footprint. Noise or harassment impacts could potentially occur in cluster 251 due to the close proximity of cavity trees to possible construction and operation activities. Potential adverse impacts to nesting and roosting from construction and operational activities to include noise will likely be determined by intensity, frequency, duration and timing.

All seven of the remaining cavity trees within cluster 251 are in close proximity of the clearing limits and the Range Operations Control Area (ROCA) (**Figure 12**). The RCW cavity trees and their closest respective distances to clearing limits/ROCA are as follows: 02773 (1 ft.), 03617 (60ft.), 09070 (70ft.), 02777 (30ft.), 09071 (55ft.), 09136 (25ft.), and 2897E (125ft.). The ROCA is the center for overall control and operation of

the range, training exercises, administrative services and support facilities. Primary facilities with the ROCA are control tower, small after action review building, operations/storage building, latrine, bleacher enclosure, covered mess, ammunition loading dock, unit staging area and six bivouac pads. All vehicular pavement will be constructed of aggregate base course except for high wear areas that will be constructed of concrete. It is anticipated due to close proximities of cluster 251 cavity trees to the ROCA, construction and operational activities are likely to adversely affect RCW behavior during roosting and nesting to include frequent flushing during roosting/incubation and/ or less frequent feeding of nestlings, which can cause a reduction in nest success or the number of young fledged. RCW cluster 251 is anticipated to be "taken" due to harassment from the clearing of the range footprint, construction of facilities and from operational noise and everyday activities associated with the ROCA.

Figure 12. RCW Cluster 251 Cavity Tree Proximities to MPTR



Group Level Analysis (GLA)

Retaining sufficient foraging habitat alone does not ensure the persistence of an RCW group. The continued occupation of a cluster not only depends on the amount of foraging habitat, but also depends on the density of active clusters around it (Hooper and Lennartz, 1995). Research has shown that the more aggregated RCW clusters are, the higher the probability of persistence, even with substantial foraging habitat loss (Crowder et al., 1998; Letcher et al., 1998). RCW groups in moderately dense to dense populations have been shown to be less sensitive (i.e., group size and productivity) to drastic loss in habitat than in sparser populations with seemingly more available foraging habitat (Hooper and Lennartz, 1995). Therefore, when active RCW clusters are to be "taken" for a project, it is necessary to assess the impact of that loss on the demographic stability of neighboring RCW groups. This is done by examining the density of active RCW clusters on the landscape.

For the group density analyses in this document, a 1.25 mile radius buffer was drawn around the cluster center for every active cluster within 0.5 mile of a project's clearing limits, adjacent to a cluster "taken" (direct or indirect) or affected by the MPTR (some foraging habitat or cavity trees removed) (**Figure 13**). For each cluster analyzed, the number of active clusters within 1.25 miles of its cluster center was calculated. All clusters with a core cluster area (minimum convex polygon of all cavity trees and a 200 ft. buffer around them) within 1.25 miles of the target cluster's center were included in the cluster density totals. These totals did not include the subject cluster if it was expected to be "taken" by the MPTR project. However, "taken" clusters were included in the pre-project density totals of their neighboring clusters.

Eleven active RCW cluster centers fell within 0.5 mile of the project clearing limits and were analyzed (**Table 5**). A total of 46 active or breeding clusters are within 1.25 miles of these clusters with 39 maintaining over 120 acres of PGQFH and 7 clusters maintaining greater than 75 acres but less than 120 acres of PGQFH. The 11 clusters analyzed had pre-project densities between 13 and 20 groups (average density = 17.45) and post-project densities between nine and 14 groups (average density = 11.27) within 1.25 miles of the target cluster's center. Research has shown that clusters with ≤ 2.5 active clusters within 1.25 miles were considered "sparse," and therefore more vulnerable to abandonment because of lack of emigration/immigration (Conner and Rudolph, 1991). Group densities, like those found on Fort Bragg, are much higher now and abandonment is rare due to active management like cavity replacement (Walters, 2021). All clusters analyzed within 1.25 miles had densities ≥ 9.0 active groups post-project and are considered to be unaffected by the associated project.

Figure 13. Group Level Analysis

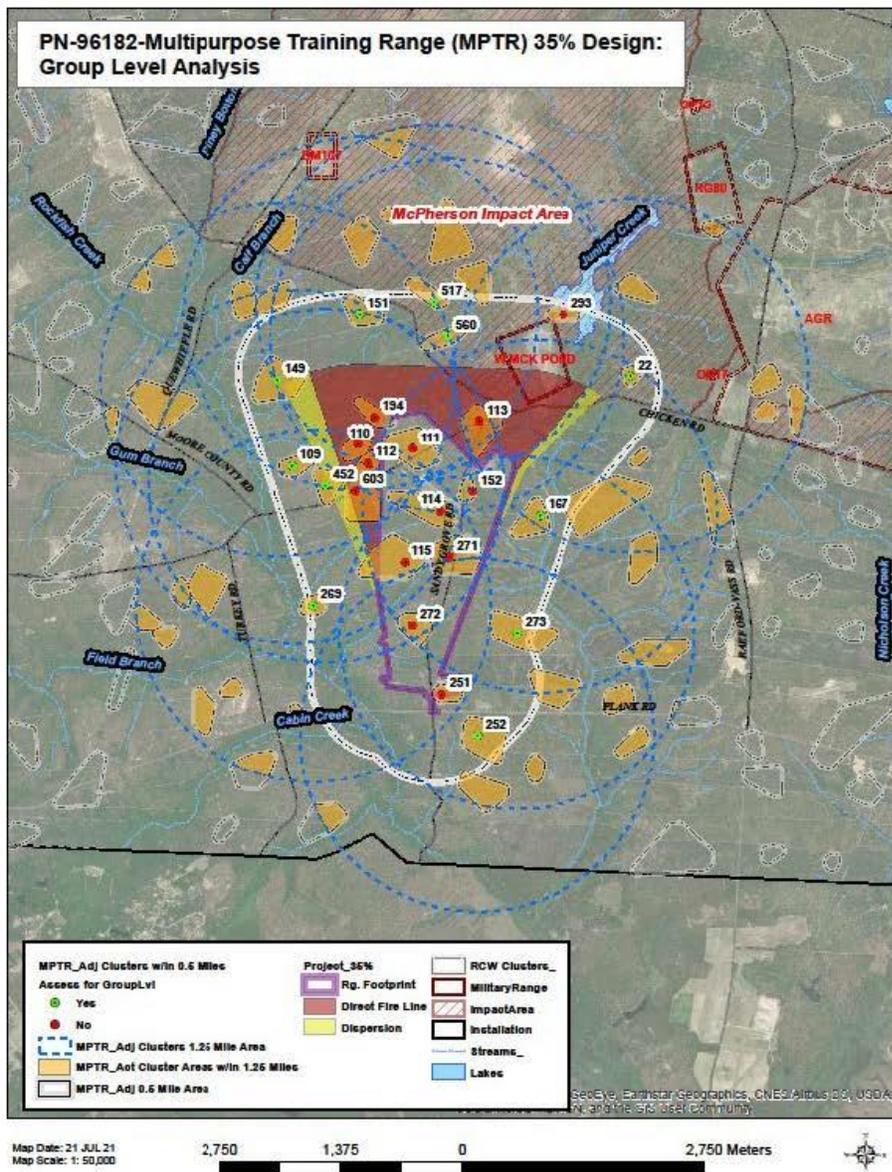


Table 5. Landscape Density Analysis: active clusters w/in 1.25 miles from center of clusters adjacent to project area

(*NOTE - Project Area includes Range Footprint and Direct Fire Line)

	Active Cluster Areas w/in 1.25 miles of Adjacent Clusters														Post-	Pre-	
	22	116	117	153	167	219	256	294	387	560	583	585	1029		Project	Project	
Adjacent Cluster Centers (w/in 0.5 miles of Project Area)	Post-project count	1	1	1	1	1	1	1	1	1	1	1	1		13	14	
	109	109	146	148	149	151	216	269	426	451	452	560			Total		
	Post-project count	1	1	1	1	1	1	1	1	1	1	1			11	20	
	149	40	51	109	146	148	149	151	193	248	426	450	452	517	560	Total	
	Post-project count	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	19
	151	40	51	109	146	149	151	153	292	426	452	517	546	560		Total	
	Post-project count	1	1	1	1	1	1	1	1	1	1	1	1	1		13	18
	167	22	167	219	221	255	256	273	387	1029						Total	
	Post-project count	1	1	1	1	1	1	1	1	1						9	18
	252	53	195	221	252	253	254	255	273	449						Total	
	Post-project count	1	1	1	1	1	1	1	1	1						9	13
	269	75	76	109	172	216	269	270	273	451	452	588				Total	
	Post-project count	1	1	1	1	1	1	1	1	1	1	1				11	19
	273	53	54	167	219	221	252	253	254	255	256	273	449			Total	
	Post-project count	1	1	1	1	1	1	1	1	1	1	1	1			12	18
	452	109	148	149	151	216	269	451	452	560						Total	
	Post-project count	1	1	1	1	1	1	1	1	1						9	19
	517	40	51	146	149	151	153	292	426	517	546	560				Total	
	Post-project count	1	1	1	1	1	1	1	1	1	1	1				11	16
	560	51	109	146	149	151	153	292	294	452	517	546	560			Total	
Post-project count	1	1	1	1	1	1	1	1	1	1	1	1			12	18	

Table 5 (continued)

Cluster #	Status	Pre-project PGQFH	Post-project PGQFH
22	ACT	275.19	275.19
40	BRE	175.78	175.78
51	ACT	142.14	142.14
53	BRE	93.14	93.14
54	ACT	159.00	159.00
75	BRE	181.91	181.91
76	BRE	186.73	186.73
109	BRE	127.29	127.29
116	BRE	76.39	76.39
117	ACT	163.47	163.47
146	BRE	123.32	123.32
148	BRE	269.88	269.88
149	BRE	225.56	208.99
151	BRE	197.91	196.61
153	ACT	239.40	239.40
167	BRE	209.69	208.59
172	BRE	167.32	167.32

Cluster #	Status	Pre-project PGQFH	Post-project PGQFH
193	BRE	138.11	138.11
195	BRE	208.60	208.60
216	BRE	105.78	105.78
219	ACT	227.69	227.69
221	ACT	203.63	203.63
248	BRE	162.23	162.23
252	BRE	156.19	156.19
253	ACT	246.61	246.61
254	BRE	223.07	223.07
255	ACT	172.00	172.00
256	ACT	139.07	139.07
269	BRE	276.18	276.18
270	BRE	81.63	81.63
273	BRE	229.42	229.42
292	ACT	192.03	192.03
294	ACT	226.74	226.74
387	ACT	236.49	236.49

Cluster #	Status	Pre-project PGQFH	Post-project PGQFH
426	BRE	170.83	170.83
449	ACT	221.65	221.65
450	BRE	128.65	128.65
451	BRE	175.76	175.76
452	BRE	109.33	108.60
517	ACT	111.18	111.18
546	ACT	165.13	165.13
560	ACT	168.49	135.18
583	ACT	232.16	232.16
585	BRE	213.13	213.13
588	BRE	103.92	103.92
1029	ACT	231.54	231.54

Adjacent to Project	
Clusters > 120	39
Clusters >75 <120	7
Clusters < 75	0
Total Clusters	46

Neighborhood Level Analysis (NLA)

The neighborhood analysis addresses potential adverse effects on the RCW groups within the action area which are not directly affected by habitat loss within their partitions. These indirect effects result from demographic isolation and habitat fragmentation and are related to group density, similar to the group level analysis.

For the purpose of this assessment and based on the scale of this project, surrounding groups within a 3.7-mile radius were considered or analyzed because they fall within the natural dispersal distance of the proposed project. 130 RCW groups and/or habitat partitions were identified to be within 3.7 miles of the project footprint. Of the 130 groups, 116 are located on Fort Bragg and 14 are located on private lands. 113 of the 116 groups on Fort Bragg are identified as active or breeding (**see Table 6**). 98 RCW groups have over 120 acres of PGQFH, 17 groups have less than 120 acres but greater than 75 acres of PGQFH and one group (cluster 268) has less than 75 acres of PGQFH. A GIS analysis using the Matrix was completed for stand contiguity within the 3.7-mile radius (**Figure 14**).

The clearing limits of the MPTR are wide enough (greater than 1/3 mile) that the resulting gap will likely impede dispersal of foraging RCWs (Walters, 2021). Connectivity and dispersal around the MPTR will remain to the north between the MPTR and McPherson Impact Area through RCW clusters (560, 153, 517 and 292) and to the south through RCW clusters (252, 254, 172, 173 and 195). Maintaining connectivity post-project between RCW groups rather than augmenting cluster density in the areas around the project is most important. However, increasing the density of groups south of the MPTR could help in maintaining connectivity (Walters, 2021).

Although the construction and operation of the MPTR will have direct adverse impacts on loss of habitat and RCW groups, the dispersal of the surrounding neighborhood groups would not be adversely affected by group fitness, habitat fragmentation, or isolation.

Figure 14. Neighborhood Level Analysis

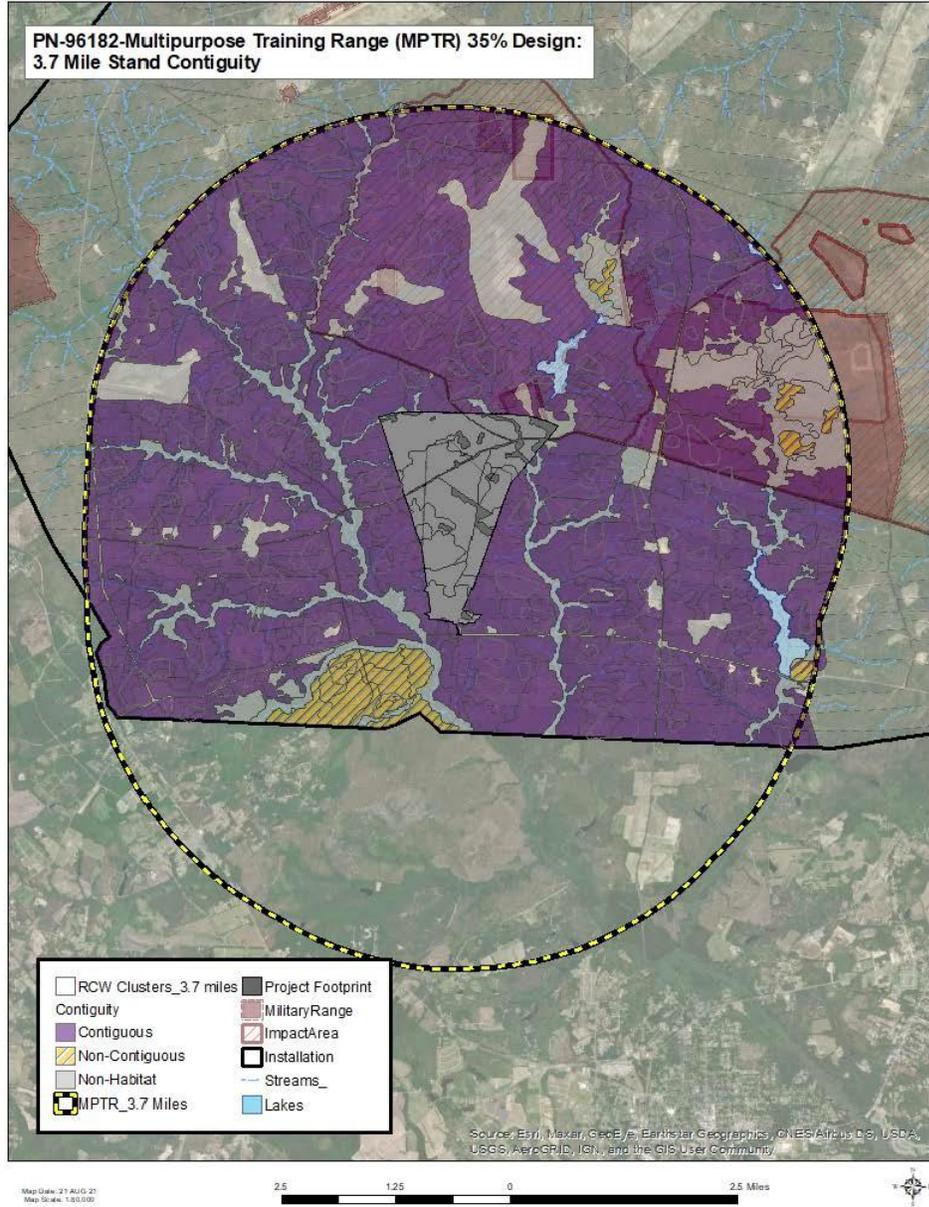


Table 6. Neighborhood Level Analysis

Property	Partition #	Status	Minimal Distance to Project	PGQFH (Current)
Bragg	5	BRE	Neighbor 3.7 Mile	209.44
Bragg	6	BRE	Neighbor 3.7 Mile	223.33
Bragg	16	ACT	Neighbor 3.7 Mile	159.53
Bragg	22	ACT	Neighbor 3.7 Mile	275.19
Bragg	23	ACT	Neighbor 3.7 Mile	119.48
Bragg	35	BRE	Neighbor 3.7 Mile	202.84
Bragg	40	BRE	Neighbor 3.7 Mile	175.78
Bragg	46	ACT	Neighbor 3.7 Mile	154.27
Bragg	47	ACT	Neighbor 3.7 Mile	192.55
Bragg	48	ACT	Neighbor 3.7 Mile	209.03
Bragg	49	ACT	Neighbor 3.7 Mile	209.94
Bragg	51	ACT	Neighbor 3.7 Mile	142.14
Bragg	53	BRE	Neighbor 3.7 Mile	93.14
Bragg	54	ACT	Neighbor 3.7 Mile	155.19
Bragg	69	BRE	Neighbor 3.7 Mile	246.13
Bragg	73	BRE	Neighbor 3.7 Mile	235.48
Bragg	75	BRE	Neighbor 3.7 Mile	176.12
Bragg	76	BRE	Neighbor 3.7 Mile	187.87
Bragg	77	BRE	Neighbor 3.7 Mile	142.33
Bragg	78	NBP	Neighbor 3.7 Mile	151.05
Bragg	79	BRE	Neighbor 3.7 Mile	146.78
Bragg	87	ACT	Neighbor 3.7 Mile	162.44
Bragg	109	BRE	Neighbor 3.7 Mile	129.57
Bragg	116	BRE	Neighbor 3.7 Mile	76.39

Property	Partition #	Status	Minimal Distance to Project	PGQFH (Current)
Bragg	117	ACT	Neighbor 3.7 Mile	157.72
Bragg	118	BRE	Neighbor 3.7 Mile	152.83
Bragg	119	BRE	Neighbor 3.7 Mile	153.56
Bragg	143	ACT	Neighbor 3.7 Mile	191.88
Bragg	146	BRE	Neighbor 3.7 Mile	121.9
Bragg	147	BRE	Neighbor 3.7 Mile	171.62
Bragg	148	BRE	Neighbor 3.7 Mile	269.88
Bragg	149	BRE	Neighbor 3.7 Mile	183.47
Bragg	150	BRE	Neighbor 3.7 Mile	123.08
Bragg	151	BRE	Neighbor 3.7 Mile	197.91
Bragg	153	ACT	Neighbor 3.7 Mile	139.56
Bragg	167	BRE	Neighbor 3.7 Mile	209.69
Bragg	168	NBP	Neighbor 3.7 Mile	190.61
Bragg	169	BRE	Neighbor 3.7 Mile	77.56
Bragg	170	BRE	Neighbor 3.7 Mile	91.03
Bragg	171	BRE	Neighbor 3.7 Mile	140
Bragg	172	BRE	Neighbor 3.7 Mile	167.32
Bragg	173	BRE	Neighbor 3.7 Mile	156.22
Bragg	192	BRE	Neighbor 3.7 Mile	197.75
Bragg	193	BRE	Neighbor 3.7 Mile	138.6
Bragg	195	BRE	Neighbor 3.7 Mile	197.55
Bragg	196	BRE	Neighbor 3.7 Mile	160.21
Bragg	197	BRE	Neighbor 3.7 Mile	135.48
Bragg	199	ACT	Neighbor 3.7 Mile	129.92

Property	Partition #	Status	Minimal Distance to Project	PGQFH (Current)
Bragg	209	ACT	Neighbor 3.7 Mile	115.65
Bragg	214	NBP	Neighbor 3.7 Mile	156.41
Bragg	215	BRE	Neighbor 3.7 Mile	228
Bragg	216	BRE	Neighbor 3.7 Mile	105.78
Bragg	219	ACT	Neighbor 3.7 Mile	212.35
Bragg	220	ACT	Neighbor 3.7 Mile	165.55
Bragg	221	ACT	Neighbor 3.7 Mile	203.63
Bragg	232	BRE	Neighbor 3.7 Mile	134.05
Bragg	244	BRE	Neighbor 3.7 Mile	204.5
Bragg	246	INA	Neighbor 3.7 Mile	89.86
Bragg	247	BRE	Neighbor 3.7 Mile	209.02
Bragg	248	BRE	Neighbor 3.7 Mile	161.91
Bragg	249	BRE	Neighbor 3.7 Mile	208.27
Bragg	252	BRE	Neighbor 3.7 Mile	156.19
Bragg	253	SOL	Neighbor 3.7 Mile	246.61
Bragg	254	BRE	Neighbor 3.7 Mile	223.07
Bragg	255	NBP	Neighbor 3.7 Mile	172
Bragg	256	ACT	Neighbor 3.7 Mile	139.07
Bragg	268	BRE	Neighbor 3.7 Mile	44.51
Bragg	269	BRE	Neighbor 3.7 Mile	276.96
Bragg	270	BRE	Neighbor 3.7 Mile	81.63
Bragg	273	BRE	Neighbor 3.7 Mile	229.66
Bragg	274	BRE	Neighbor 3.7 Mile	216.94
Bragg	275	ACT	Neighbor 3.7 Mile	139.25
Bragg	276	ACT	Neighbor 3.7 Mile	118.82
Bragg	287	ACT	Neighbor 3.7 Mile	176.99
Bragg	288	ACT	Neighbor 3.7 Mile	157.94

Property	Partition #	Status	Minimal Distance to Project	PGQFH (Current)
Bragg	289	ACT	Neighbor 3.7 Mile	105.87
Bragg	292	ACT	Neighbor 3.7 Mile	189.42
Bragg	294	ACT	Neighbor 3.7 Mile	226.74
Bragg	312	ACT	Neighbor 3.7 Mile	147.48
Bragg	313	BRE	Neighbor 3.7 Mile	174.24
Bragg	314	BRE	Neighbor 3.7 Mile	239.78
Bragg	315	ACT	Neighbor 3.7 Mile	156.67
Bragg	316	ACT	Neighbor 3.7 Mile	142.8
Bragg	317	ACT	Neighbor 3.7 Mile	268.18
Bragg	335	BRE	Neighbor 3.7 Mile	221.91
Bragg	336	ACT	Neighbor 3.7 Mile	166.23
Bragg	365	BRE	Neighbor 3.7 Mile	103.4
Bragg	387	ACT	Neighbor 3.7 Mile	237.03
Bragg	389	INA	Neighbor 3.7 Mile	341.23
Bragg	409	BRE	Neighbor 3.7 Mile	124.61
Bragg	424	BRE	Neighbor 3.7 Mile	128.44
Bragg	425	ACT	Neighbor 3.7 Mile	120.31
Bragg	426	BRE	Neighbor 3.7 Mile	168.96
Bragg	446	BRE	Neighbor 3.7 Mile	203.11
Bragg	449	ACT	Neighbor 3.7 Mile	210.94
Bragg	450	BRE	Neighbor 3.7 Mile	136.59
Bragg	451	BRE	Neighbor 3.7 Mile	175.76
Bragg	452	BRE	Neighbor 3.7 Mile	109.33
Bragg	517	ACT	Neighbor 3.7 Mile	111.5
Bragg	520	BRE	Neighbor 3.7 Mile	114.1
Bragg	525	BRE	Neighbor 3.7 Mile	121.46
Bragg	527	ACT	Neighbor 3.7 Mile	226.04

Property	Partition #	Status	Minimal Distance to Project	PGQFH (Current)
Bragg	533	ACT	Neighbor 3.7 Mile	85.27
Bragg	534	ACT	Neighbor 3.7 Mile	166.87
Bragg	537	ACT	Neighbor 3.7 Mile	168.68
Bragg	546	ACT	Neighbor 3.7 Mile	178.56
Bragg	555	BRE	Neighbor 3.7 Mile	127.21
Bragg	560	ACT	Neighbor 3.7 Mile	168.49
Bragg	566	BRE	Neighbor 3.7 Mile	172.65
Bragg	583	ACT	Neighbor 3.7 Mile	234.16
Bragg	585	BRE	Neighbor 3.7 Mile	213.13
Bragg	588	BRE	Neighbor 3.7 Mile	103.92
Bragg	1000	ACT	Neighbor 3.7 Mile	165.97
Bragg	1001	BRE	Neighbor 3.7 Mile	208.3
Bragg	1020	NTM	Neighbor 3.7 Mile	248.11
Bragg	1029	ACT	Neighbor 3.7 Mile	231.04
PVT	HOKE 007		Neighbor 3.7 Mile	
PVT	HOKE 008		Neighbor 3.7 Mile	

Property	Partition #	Status	Minimal Distance to Project	PGQFH (Current)
PVT	HOKE 009		Neighbor 3.7 Mile	
PVT	HOKE 010		Neighbor 3.7 Mile	
PVT	HOKE 011		Neighbor 3.7 Mile	
PVT	HOKE 013		Neighbor 3.7 Mile	
PVT	HOKE 014		Neighbor 3.7 Mile	
PVT	HOKE 016		Neighbor 3.7 Mile	
PVT	HOKE 017		Neighbor 3.7 Mile	
PVT	HOKE 018		Neighbor 3.7 Mile	
PVT	HOKE 020		Neighbor 3.7 Mile	
PVT	HOKE 021		Neighbor 3.7 Mile	
PVT	HOKE 022		Neighbor 3.7 Mile	
PVT	RC C		Neighbor 3.7 Mile	

Total	130	19,541.03
-------	-----	-----------

Clusters > 120 acres	98
Clusters 120 > < 75 acres	17
Clusters < 75 acres	1
Unk	14

Population Level Analysis (PLA)

The Population Level Analysis considers the ability of Fort Bragg to meet its RCW recovery goal for the Sandhills East population (350 potential breeding pairs (PBGs) post-project. In 2020, Fort Bragg documented 521 active clusters and an estimated 461 PBGs on Fort Bragg. The effects analysis determined that the proposed action will incur incidental take of 12 RCW groups. The additional loss of four cavity trees within cluster 251 will occur from the clearing of the range. Two cavity trees within cluster 149 and one cavity tree within cluster 452 are anticipated to be lost within the DA. No adverse impacts are anticipated at the group or neighborhood levels which would affect dispersal or group fitness in the remaining population. After subtracting all RCW groups expected to be “taken” after the construction and operation of the MPTR, Fort Bragg will be able to manage approximately 450 PBG's, well above the population recovery goal established in the 2003 RCW Recovery Plan.

The following is a list of other endangered species that were assessed and evaluated for project impacts:

b. Saint Francis' Satyr

GIS analysis and surveys confirmed no suitable habitat is present within the project area; therefore, no impacts are expected.

c. Rough-leaved Loosestrife

GIS analysis and surveys confirmed no individuals or suitable habitat is present within the project area; therefore no impacts are expected. (Appendix 1).

d. Michaux's Sumac

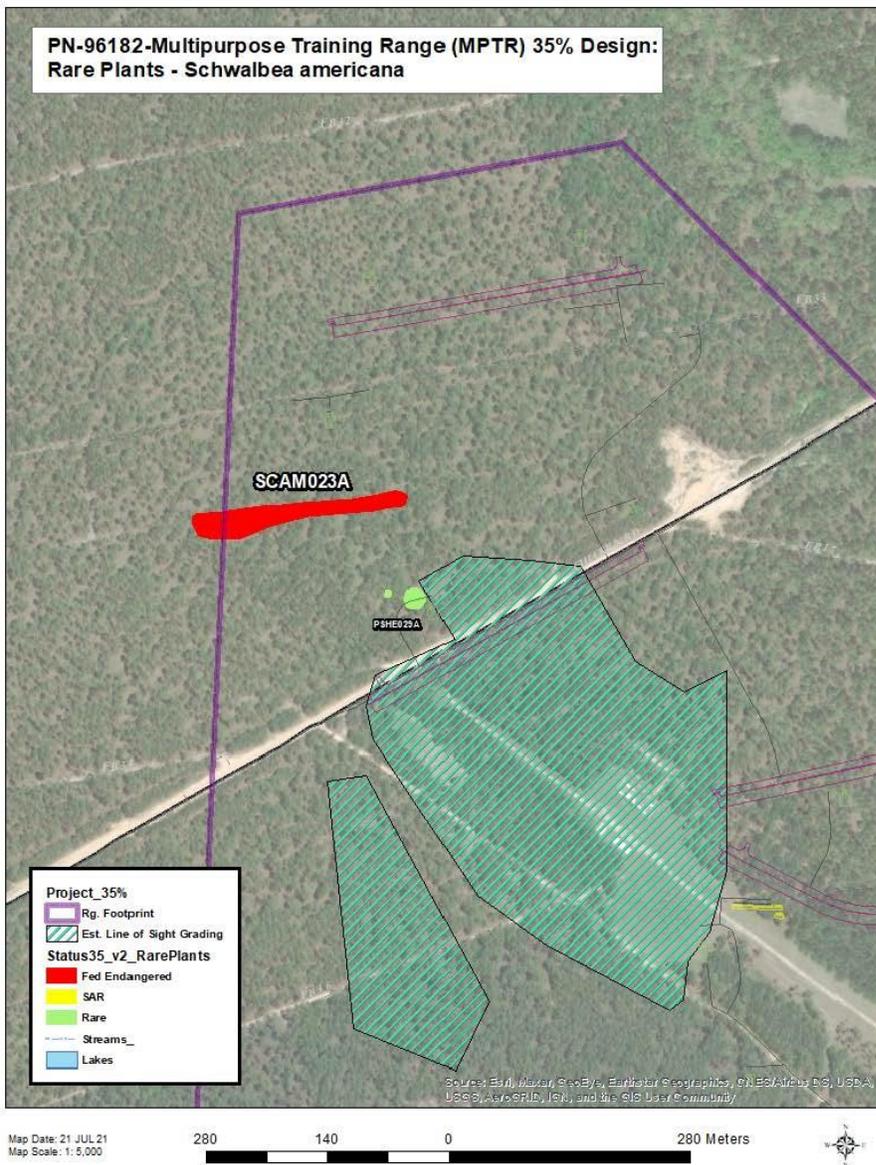
GIS analysis and surveys confirmed no individuals or suitable habitat is present within the project area; therefore no impacts are expected. (Appendix 1).

e. American Chaffseed

GIS analysis and field surveys confirmed there is one (1) known plant site present within the project area (**Figure 15**). Plant site ID# SCAM023A is one of five chaffseed plant sites that occur outside the impact area. Approximately 1.15 acres of the 1.4 acre site falls within the project footprint and would be cleared. All trees within 1.15 acres would need to be removed due to direct line-of-site from firing points to targetry located behind the plant site. Grubbing or grading within the plant site would not be required. Potential direct impacts to the American chaffseed include damage to plants from tree harvesting, ground disturbance from tree harvesting as well as the loss of canopy cover. It is anticipated that the execution of this project will result in the destruction of these rare plant occurrences (personal communication with Stacy Huskins, Fort Bragg Botanist). Although current site population densities are low, it would likely be unknown how many plants will be lost or damaged from construction activities. The boundaries of the plant

site will be posted and designated off limits to foot and vehicular traffic. No adverse impacts are anticipated from operational activities. Increased fire frequency from range operations may have a beneficial impact on the plant site as seen in the impact area populations.

Figure 15. American Chaffseed Site



Interdependent and Interrelated Actions

The following are projects related to the proposed action and have been or will be assessed for impacts to federally listed species on Fort Bragg.

MPF Tank and Maneuver Trails

The MPF will require adequate road infrastructure to access the proposed MPTR range (**Figure 16**). The existing tank trail was rehabilitated within the existing footprint in 2020 to accommodate the Soldier Vehicle Assessment (SVA) portion of the MPF; the repaired trails will continue to support MPF movement from the main cantonment area to the proposed MPTR. On 20 May 2021 DPW Engineering, Environmental, and Roads personnel met with DPTMS personnel to discuss MPF infrastructure capability. According to DPW and DPTMS personnel, the MPF will utilize existing infrastructure. Existing firebreaks and maneuver trails have been or will be rehabilitated. In addition, maneuver trails can support MPF operations, but will require repair to support sustained use. Completed and future planned work to maintain maneuver trails to support the MPF has and will continue to be vetted through the Training Lands Working Group (TLWG) and environmental review process to assess impacts. Impacts to federally listed species have been determined to be insignificant or discountable for trail rehabilitation work already completed. Future actions are also anticipated to have no effect; however, actions that are determined to have a “may affect” on listed species will be assessed in accordance with section 7 consultation requirements.

Tactical Equipment Maintenance Facilities (TEMF)

Each Brigade will require a TEMF to store and maintain vehicles including the MPF. Project 12289 anticipated construction will occur FY 2028. Projects 93098 and (project # to be determined) will occur at an unspecified future date. The proposed projects would construct a standard organizational tactical equipment shop with a seven-and-a-half ton bridge crane, deployment storage, fuel dispensing and storage, and hardstand to support the inbound MPF mission. Project 12289 will additionally construct an organizational storage facility and a privately owned vehicle parking lot. All three TEMF projects will have electrically operated rollup doors, vehicle exhaust ventilation, and compressed air. Each TEMF will include tying into existing facilities, site improvement and drainage, hardstand, fencing and a satellite accumulation area to temporarily place hazardous material and petroleum, oil, lubricants.

The current proposed location for TEMF facilities is north of Longstreet Road and west of Building A-1801 within the main cantonment area (**Figure 17**). TEMF 12289 is located on an approximate 5 acre site with the other two TEMFs located adjacent to the west on an approximate 12 acre site between two wetland fingers of McPherson Creek. All three TEMF projects occur within the quarter and half-mile forage partition of RCW cluster 405, which is located in the Greenbelt. The site plans for the three TEMFs are conceptual at this time; therefore, the effects on cluster 405 are not included in the

analysis. These projects will be assessed subject to the section 7 consultation process in the future once site plans are finalized.

Figure 16. MFP Tank and Maneuver Trails

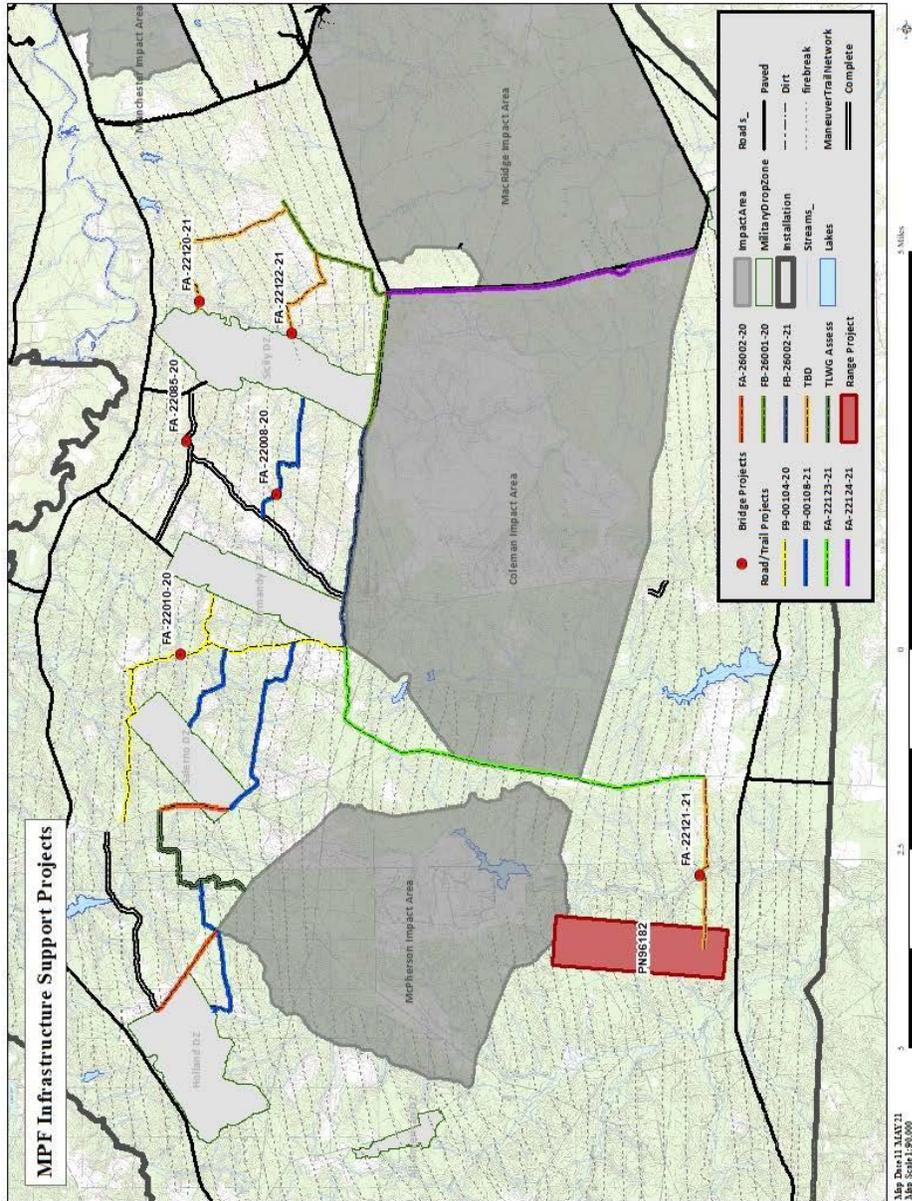
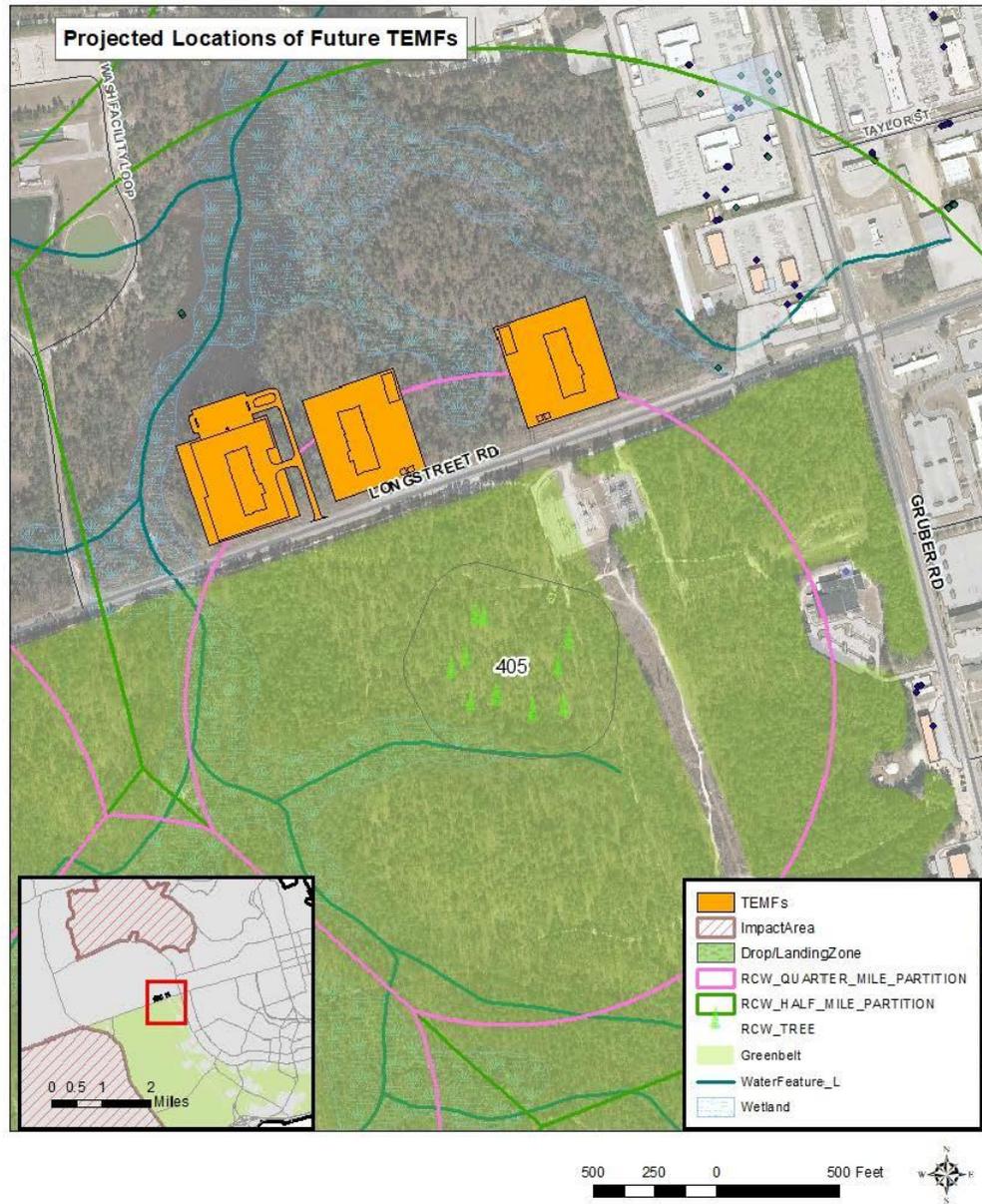


Figure 17. Projected Locations of Tactical Equipment Maintenance Facilities (TEMFs)



Cumulative Effects

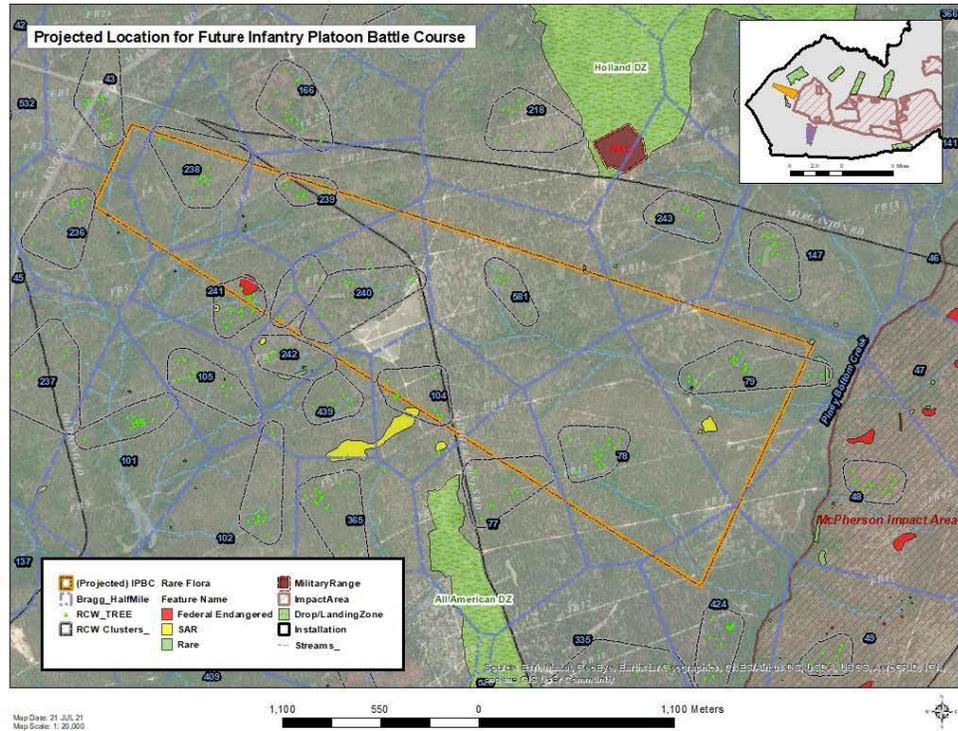
Cumulative effects are the sum of efforts of future private, state and tribal activities, as well as past, present and future projects, which are reasonably certain to occur in close proximity to the project area (NEPA 40 CFR 1500-1508 and USFWS Consultation Handbook, 1998). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

No state, local, private or tribal actions are forecasted to occur in the project area or surrounding adjacent dispersal areas.

Future Range Construction

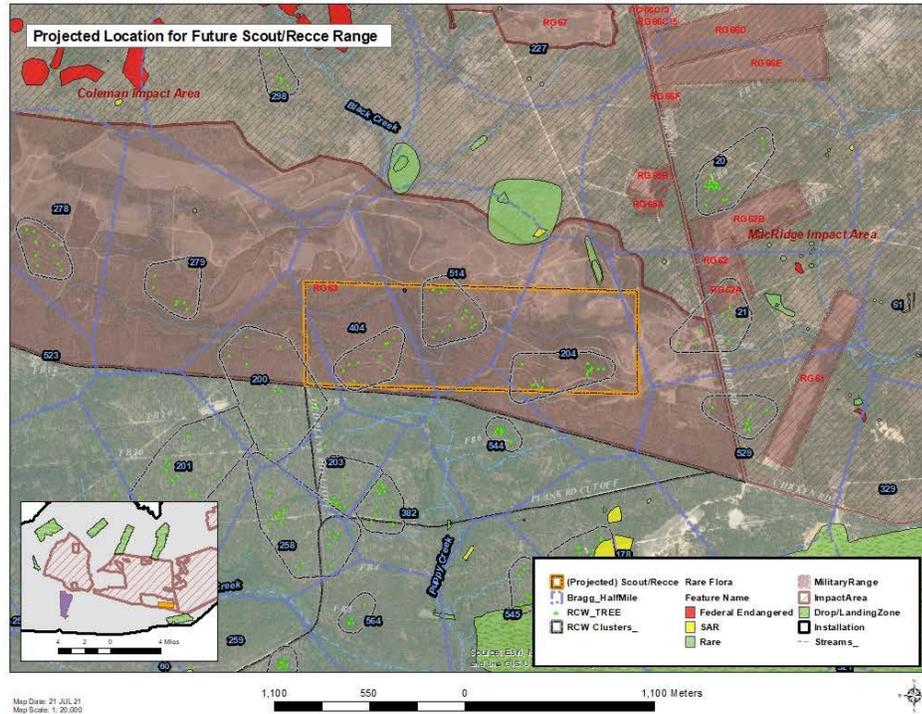
The construction of a new Infantry Platoon Battle Course (IPBC) range has been proposed north of the All American Landing Zone on the northwest side of Fort Bragg (**Figure 18**). The IPBC construction, which will support MPF operation has the potential to affect 17 RCW clusters, one American chaffseed site, and seven SAR flora sites. Species locations associated with the IPBC do not overlap the MPTR; therefore, RCW group analysis and threatened/endangered flora impacts will be IPBC-specific. MPTR effects to RCW and rare plant populations will have been factored into the environmental baseline when determining population level impacts from the construction of the IPBC. A design has not been issued to adequately analyze endangered species impacts; future consultation with the USFWS will be required.

Figure 18. Projected Location for Future Infantry Platoon Battle Course



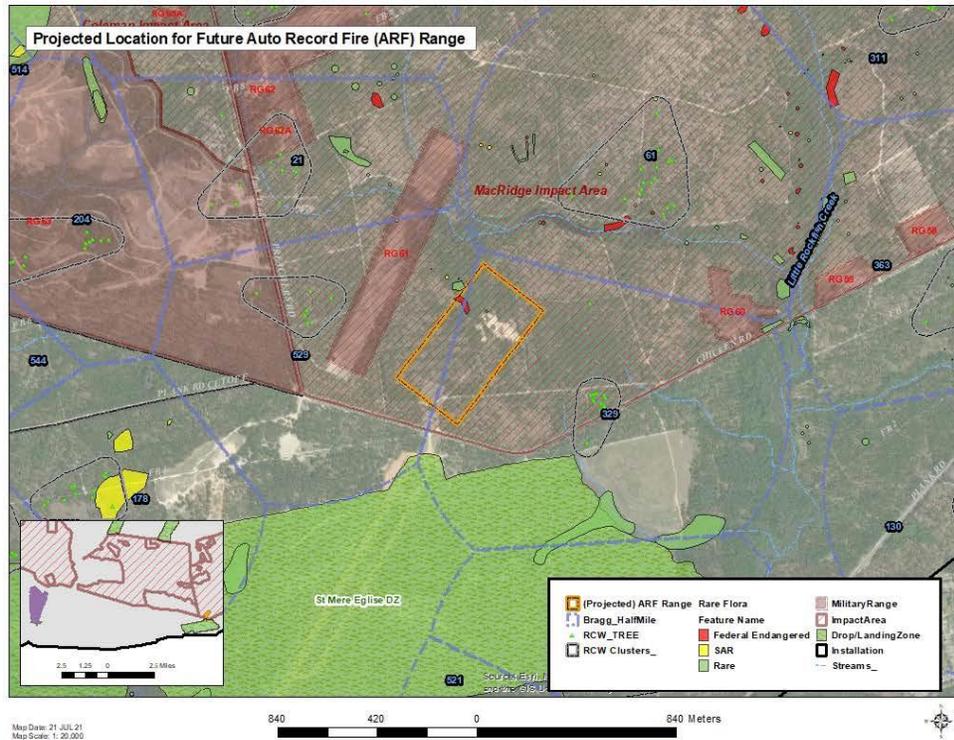
The construction of a new Scout/Recce Gunnery Complex (Scout) has been proposed on Range 63 to give Fort Bragg an initial mounted gunnery capability (**Figure 19**). The map provided only shows the projected general location and not a proposed layout of the range. The standard Scout range includes two course roads that extend approximately 1500 meters downrange. Individual target and target arrays extend to 2000 meters and the range is approximately 650 meters wide. The range includes an overlay of the four center lanes of a Multipurpose Machinegun (MPMG) range to support the scout units vehicle mounted and dismounted machinegun and sniper training. The Scout construction has the potential to affect seven RCW clusters. MPTR as well as other completed range project/s effects to RCW and rare plant populations will have been factored into the environmental baseline when determining the population level impacts from the construction of the Scout range. A design has not been issued to adequately analyze endangered species impacts; future consultation with the USFWS will be required.

Figure 19. Projected Location for Future Scout/Recce Range



The construction of a new Auto Record Fire (ARF) range has been proposed in the southwest corner of MacRidge Impact Area (**Figure 20**). The layout will be a 600 meter, 14-lane used for training and day/night qualification requirements with rifles and carbines, and specifically the Next Generation Squad Weapon (NGSW). The range will include a range operations area, control tower, classroom building, operations/storage building, bleacher enclosure, covered mess and ammunition breakdown building. Supporting facilities include electric service, site improvements and information systems. The general range footprint approximates 50 acres which does not include the SDZ. The ARF construction has the potential to affect three RCW clusters and one Rough-leaved loosestrife site. MPTR as well as other completed range project/s effects to RCW and rare plant populations will have been factored into the environmental baseline when determining the population level impacts from the construction of the ARF range. A design has not been issued to adequately analyze endangered species impacts; future consultation with the USFWS will be required.

Figure 20. Projected Location for Future Auto Record Fire Range



8. Conservation Measures

The following conservation measures will be implemented as a means to minimize project impacts to the RCW and American chaffseed:

a. Avoidance and Minimization

The avoidance and minimization measures described below are to be considered part of the proposed action. The following measures will be taken wherever applicable in order to minimize impacts to RCWs and American chaffseed affected by the proposed action:

Although many cavity trees are within the limits of construction analyzed for the MPTR, after personal communication with the Fort Bragg Range Officer, there could be some instances where the entire limits of construction or range footprint may not require 100% clearing. Fort Bragg personnel will work with USACE Project Managers and Range Operations representatives and their design firms during additional coordination meetings to identify and minimize impacts where practical.

All RCW cavities in trees designated to be cut will be screened to prevent RCWs use at the time of cutting. Cavity trees that are cut will be either destroyed onsite or collected for educational purposes with appropriate permitting from the USFWS. Active cavity trees will not be cut during the nesting season (April-July).

Clusters which are "taken" because of insufficient post-project foraging habitat or harassment due to projected impacts, could end up persisting on the landscape. If "take" clusters are found to remain active and productive, despite reduced foraging habitat and training disturbance, they could be petitioned for inclusion back into population goals. Fort Bragg will continue to protect, monitor, and provision (where applicable) clusters that are "taken" by the MPTR project for a period of no less than 5 years. These actions will support consultation and decisions with USFWS as to "take" cluster sustainability and inclusion towards the population's recovery goals. Any "taken" RCW clusters that remain active should aid in increasing (or maintaining) cluster density and population health, maintenance of demographic connectivity and continue to contribute fledglings for overall population stability and growth.

Fort Bragg will evaluate and provision habitat, where possible, in adjacent forested areas where surplus acreage will be identified that could potentially allow for refuge/opportunity for displaced RCW to establish new clusters. In addition, increasing densities of groups in adjacent areas, specifically the area south of the MPTR (around clusters 252, 254, 172, 173 and 195), could also benefit in maintaining connectivity between RCW groups to the east and west of the MPTR (Walters, 2021).

It is anticipated due to close proximities of cluster 251 cavity trees to the ROCA, construction and operational activities are likely to adversely affect RCW behavior during roosting and nesting. Fort Bragg Endangered Species Branch biologists, will provision (where applicable) additional cavity trees away from the ROCA to avoid or minimize potential noise/harassment to cluster 251.

All trees within 1.15 acres of an American chaffseed site within the project clearing limits would need to be removed due to direct line-of-sight from firing points to targetry located behind the plant site. Grubbing or grading within the plant site would not be required. In order to avoid and/or minimize damage to plants from tree harvesting, individual stems will be flagged if visible prior to harvest. The Fort Bragg botanist will coordinate with the Forestry Branch and USACOE Resident Forester to develop specific methods to mitigate impacts to the site during harvesting. The boundaries of the plant site will be posted/signed and designated off limits to foot and vehicular traffic.

b. Pine Thinning and Midstory Hardwood Removal

In 2020, the TLWG shifted focus and developed the management prescription for habitat improvements within the Sandy Grove (TAG). The planning and construction of the MPTR necessitated the prioritization. Pine stands were evaluated within the area for pine thinning and for hardwood midstory issues (**Figure 21**). Analysis of timber stands thru the USFWS RCW matrix and field observations have identified pine stands to be proposed for timer stand improvement. Within training areas GG1, GG2, HH1,

and DD3, one hundred and eighty (180) stands have been prioritized for thinning operations (3,743 total acres) (**Figure 22**).

GG1: 47 stands (1,094 acres)
GG2: 71 stands (1,291 acres)
HH1: 53 stands (1,175 acres)
DD3: 9 stands (183 acres)

To date, 915 acres of thinning operations within Sandy Grove TAG, P01 (491 acres) and P02 (424 acres), has been completed. Sandy Grove P03 (350 acres) and Sandy Grove P04 (364 acres) have been sold. Sale areas for Sandy Grove P05 (373 acres), Sandy Grove P06 (368 acres) and Sandy Grove P07 (207 acres) have been delineated for thinning operations (**Figure 23**). All stands will be thinned in accordance with Fort Bragg INRMP (INRMP, Forest Management Component Appendix 1, 2019) once vetted and approved through the TLWG. Planning for timber thinning actions will continue to be adjusted, if needed, to provide optimum habitat conditions for rare species post-project.

Fort Bragg will improve habitat quality in the Sandy Grove through hardwood midstory treatments to ensure it meets SMS requirements, as well for managing towards RS. Habitat conditions are annually observed and recorded within every RCW cluster core area, during the spring activity updates. Cluster core areas are defined as a buffer zone of continuous forest, 61 m (200 ft.) in width, is generally established around the minimum convex polygon containing a group's active and inactive cavity trees. Endangered species biologists observe midstory and stand structure conditions and identify and document for species, height, and density.

Areas for midstory restoration (hardwood and pine regeneration) will be addressed specifically within endangered species sites based on annual data collection. These will be more "spot" treatments as determined necessary by the Habitat Restoration Program Manager rather than landscape treatments. Most areas within the Sandy Grove TAG have already been prioritized and treated. Any future midstory restoration will be identified and treated after planned pine thinning actions. Additional management priorities, dictated by cluster activity status, group fitness, neighborhood analysis, or TLWG training area prescriptions, will be identified to reduce midstory issues within core cluster areas. All habitat restoration activities will be completed before operations begin on the MPTR.

Figure 21. Location of Sandy Grove TAG

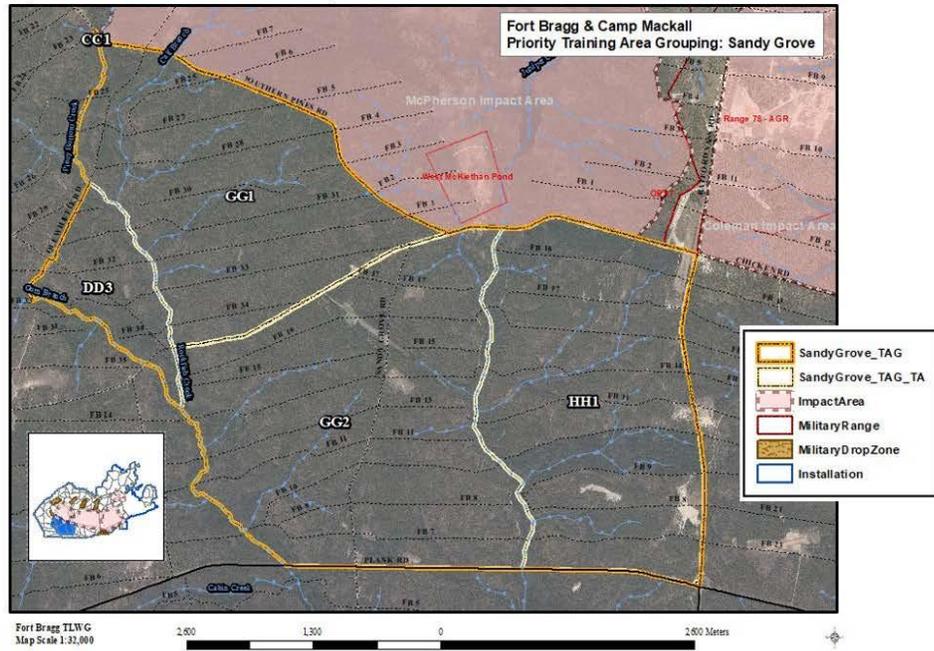


Figure 22. Timber Stands: Priority Thinning

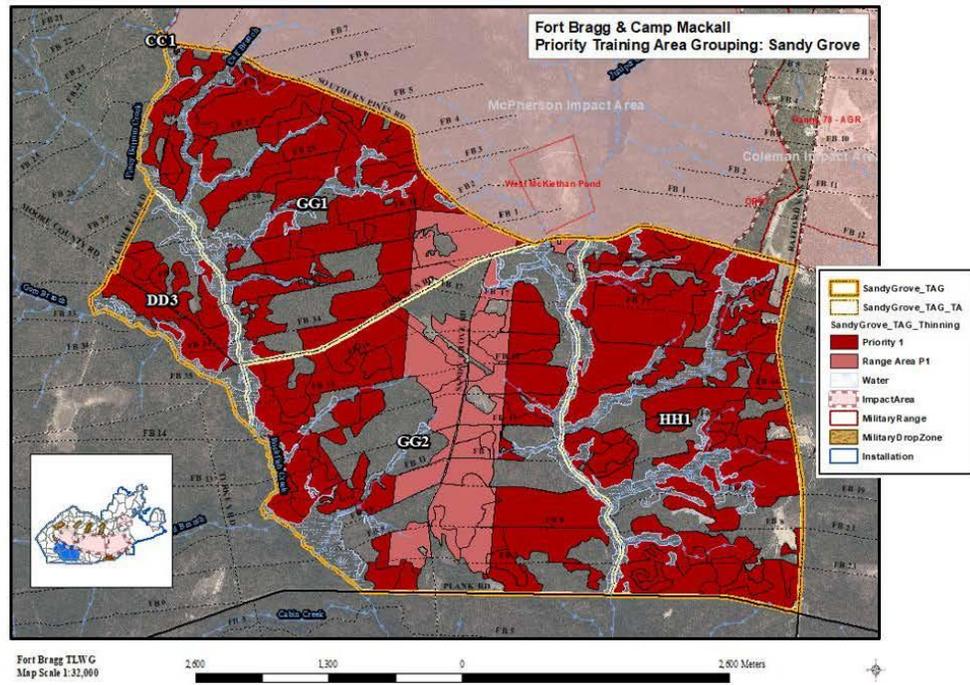
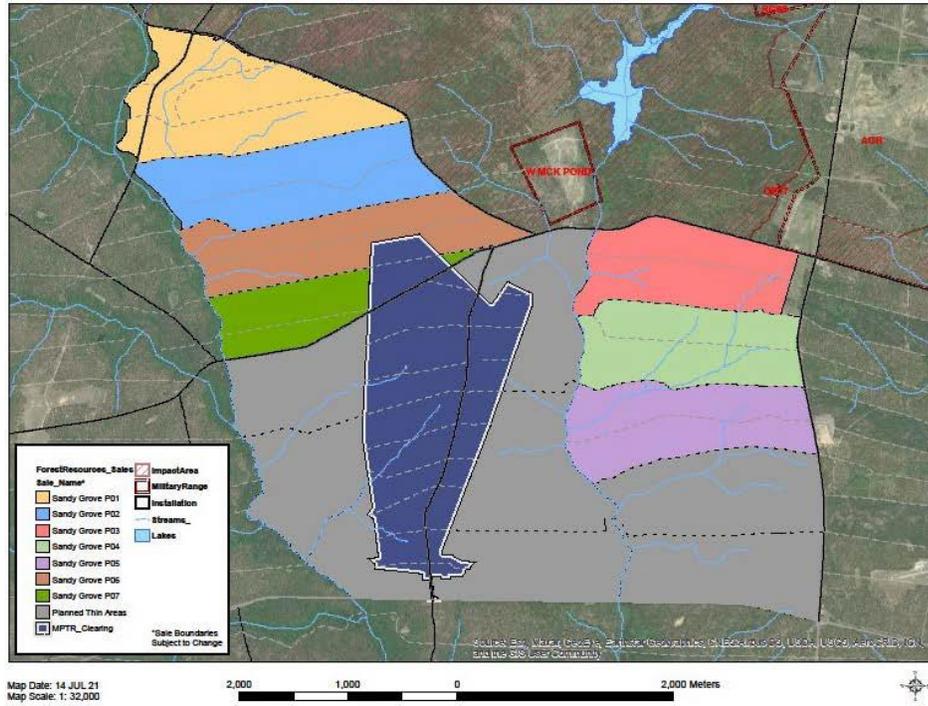


Figure 23. Planned Thinning Operations



c. Prescribe Burn and Wildfire

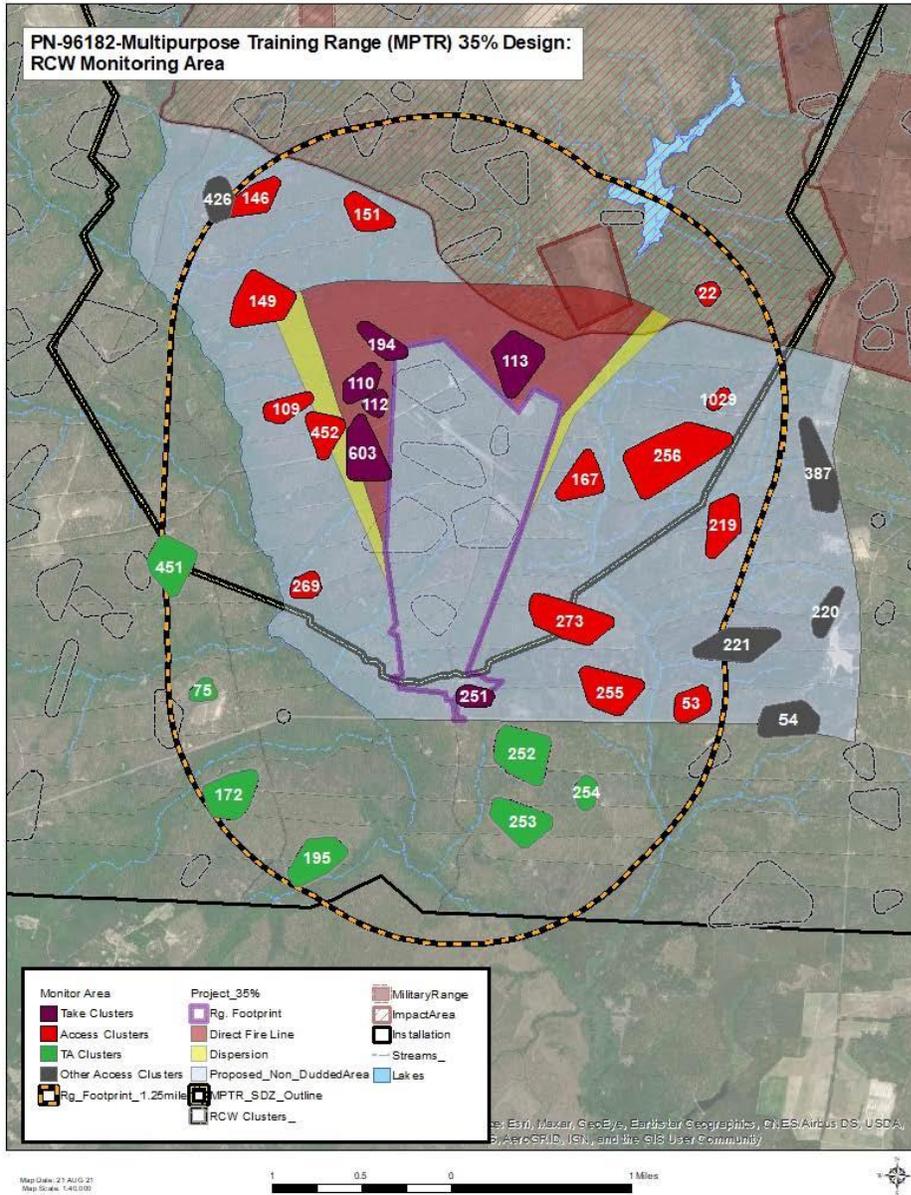
Wildland fire is a critical component for the propagation of many species and their habitats. Constraints related to wildland fire are individual RCW cavity trees across the landscape and protected plant sites. Fort Bragg will continue to prescribe burn managed forested areas, emphasizing growing season burns, on a one to three-year cycle. Fort Bragg will develop written burn prescriptions that include the fuel reduction or restoration needs of each burn block and the burning methodology that is needed to accomplish the stated objectives. Site-specific prescriptions will also include provisions to avoid adverse effects on endangered species habitats, RCW cavity trees, protected plant sites, and other significant habitat features. Restoration burns will be the preferred stand restoration tool to improve ground cover requirements. Fire managers will coordinate with Fort Bragg Range Control to schedule and access areas for prescribed burning similar to other danger areas around ranges.

Fort Bragg wildland fire personnel will continue to respond to wildfires within the MPTR and associated non-duded area. Access onto the MPTR and within the surrounding danger area by wildland fire personnel will be coordinated with Range Control. Personnel will rake or burn around the base of RCW trees, when possible, in order to protect the trees from fire damage. Fire frequencies from wildfires within the project area are likely to increase due to MPTR operations.

d. Monitoring

Fort Bragg will use the measurement of 1.25 miles (Hooper and Lennartz, 1995) to develop the RCW monitoring plan moving forward. Monitoring will require banding of adult and juvenile RCWs and will collect breeding season data including average number of eggs, nestlings, fledglings, and adults. All clusters within 1.25 miles of the footprint of the action area (range clearing) will be monitored (**Figure 24**). This comprises 12 clusters with proposed "take"; six within the range footprint (111, 114, 115, 152, 271 and 272), five additional within the direct-fire line (110, 112, 113, 194 and 603), and one adjacent to the ROCA (cluster 251, also partly within the range footprint). The remaining clusters are a subset of the clusters used to conduct the neighborhood analysis (extending 3.7 miles from the construction limits). Excluding the 12 clusters directly impacted by the MPTR, there are 29 clusters with cluster centers within 1.25 miles of the construction footprint. Three of these are "Not Managed" (NTM). Five active clusters and 2 of the 3 NTM clusters are in impact areas (access for monitoring purposes is unlikely). Twenty-one clusters, located outside of the range footprint, DFL, and ROCA, will be monitored (clusters 22, 53, 75, 109, 146, 149, 151, 167, 172, 195, 219, 252, 253, 254, 255, 256, 269, 273, 451, 452 and 1029). Only 13 (clusters 53, 109, 146, 149, 151, 167, 219, 255, 256, 269, 273, 452, and 1029) of the 21 clusters fall within the proposed "non-duded" areas, which will require coordination for access. One other cluster, 22, lies within the established McPherson "non-duded" area which is currently coordinated for monitoring purposes.

Figure 24. RCW Monitoring Area



Monitoring these 14 clusters, in addition to any of the 12 "take" clusters where active RCW trees remain on the landscape, will require weekly access approval from Range control during the breeding season. Currently, six clusters (110, 112, 113, 194, 251 and 603) are projected to retain enough cavity trees for monitoring. In total, 27 clusters will be monitored through a combination of in-house personnel and existing contract support, 20 within the range and "non-dudded" areas and seven within the adjacent training areas. Additionally, continued post police access will be needed for the five active Impact Area clusters, for cavity provisioning and activity status updates. Additional information on the collaboration between DPW and DPTMS Range Operations for the development, coordination and implementation of the RCW monitoring plan is provided in **Appendix 3**.

Breeding season data, including average number of eggs, nestlings, fledglings, PBG's and solitary bird clusters (post-project) will be compared to annual population and group averages of breeding season data over the past five years (pre-project), to evaluate possible impacts of cavity loss and adult dispersal from surrounding clusters. Only three of the managed 38 clusters have no pre-project monitoring data (22, 219, and 256). Group composition and breeder retention rates will be compared to identify statistical differences pre and post project.

Fort Bragg will continue to monitor the American chaffseed site (ID# SCAM023A) post-project to assess impacts associated with the MPTR and long-term viability of the plant site. The Fort Bragg botanist will coordinate with Range Control to schedule and access areas for monitoring.

9. Conclusion

In accordance with section 7(c) of the ESA, Fort Bragg has prepared this biological assessment and analyzed the effects to federal listed species for the proposed construction and operation of the MPTR. If during field surveys or analyses, additional project impacts are identified that were not analyzed in this BA, Fort Bragg will seek input from USFWS and reinitiate consultation, as necessary. Fort Bragg has determined the biological conclusions for the following listed species:

a. Red-cockaded Woodpecker

The impact analysis, through an FHA, a GIS analysis, and field evaluations considered: direct, indirect, interdependent/interrelated and cumulative impacts as they pertain to the forage habitat requirements; forest fragmentation; RCW harm/harassment/disturbance; demographics through group isolation; and impacts to roosting/nesting habitat.

RCW cavity trees and/or foraging habitat will be impacted in 18 active RCW clusters as a result of the construction and operation of the MPTR. FHAs were completed on all 18 clusters. Eleven of the eighteen clusters did not meet SMS and will be directly “taken” by loss of forage and/or cavity tree impacts from the proposed project. One additional cluster (cluster 251) will be taken due to noise/harassment impacts. Therefore, the total number of RCW clusters “taken” resulting from the construction and operation of the MPTR is 12.

Clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272 and 603 will be directly impacted and incur substantial loss to forage habitat that would likely adversely affect or “Take” these clusters as a result of clearing or direct fire impacts. Six additional clusters (clusters 22, 149, 151, 167, 251, and 560) will incur some loss of forage habitat but will retain >120 acres of PGQFH post-project. Cluster 452 will retain <120 acres of PGQFH (108.6 acres) but will incur minimal forage loss (0.7%) post-project.

Eighty-four (84) cavity trees within eight RCW clusters will be lost from clearing within the range footprint. Sixty-three (63) cavity trees are anticipated to be lost within six clusters from the direct firing of munitions over time. In addition, two inactive cavity trees within cluster 149, one advanced start tree within cluster 603, one start tree within cluster 452 and one tree no longer managed are anticipated to be lost within the DA. Four cavity trees within cluster 251 will be lost from the clearing of the range. Of the four cavity trees, one has an active, suitable cavity. The other three cavity trees are unsuitable (one relic, one inactive, enlarged cavity and one active, sub- start). Clusters 149, 452, and 251 will retain enough suitable cavities for viable roosting and nesting.

During construction and operations phases of the project, there will be noise created from vehicles, heavy machinery, personnel, live fire activities and etc. within the project area. Noise related impacts will vary in intensity, frequency and duration and will depend on the type of activity. RCW clusters 167, 273 and 251 are the only clusters

adjacent to the MPTR that would be in close proximity that potentially could be affected by noise or harassment. Cluster 251 located on the southern portion of the MPTR is the closest cluster where noise/harassment impacts from construction and operations are likely to occur. Although four cavity trees within cluster 251 will be lost from clearing, the remaining seven cavity trees within cluster 251 are less than 200 feet from the clearing limits and the ROCA. It is anticipated due to close proximities of the cavity trees to the ROCA, construction and operational activities are likely to adversely affect RCW behavior during roosting and nesting to include frequent flushing during roosting/incubation and/ or less frequent feeding of nestlings, which can cause a reduction in nest success or the number of young fledged. RCW cluster 251 is anticipated to be "taken" due to harassment from the clearing of the range footprint, construction of facilities and from operational noise and everyday activities associated with the ROCA.

No adverse impacts are anticipated at the group or neighborhood levels which would affect dispersal or group fitness in the remaining population. With the expected "take" of 12 RCW groups after the construction and operation of the MPTR, Fort Bragg will be able to manage approximately 450 PBG's, well above the population recovery goal established in the 2003 RCW Recovery Plan.

Biological Conclusion: May Affect, Likely to Adversely Affect

a. Saint Francis Satyr

Since no known populations of SFS are found within the project area, the implementation of the proposed project will have no effect on this species.

Biological Conclusion: No Effect

b. Rough-leaved Loosestrife

The Fort Bragg botanist surveyed suitable habitat within the project area but no plants were observed. Since no known occurrences of American chaffseed are found within the project area, the implementation of the proposed project will have no effect on this species.

Biological Conclusion: No Effect

c. Michaux's Sumac

The Fort Bragg botanist surveyed suitable habitat within the project area but no plants were observed. Since no known occurrences of American chaffseed are found within the project area, the implementation of the proposed project will have no effect on this species.

Biological Conclusion: No Effect

d. American Chaffseed

The Fort Bragg botanist verified that the one American Chaffseed site falls within the project area. Additional suitable habitat within the project area was surveyed but no other plants were observed. Approximately 1.15 acres of the 1.4 acre site falls within the project area.

Biological Conclusion: May Affect, Likely to Adversely Affect

10. References

- Conner, R. N. and D. C. Rudolph. 1991. Forest habitat loss, fragmentation, and red-cockaded woodpecker populations. *Wilson Bulletin*. 103:446-457.
- Crowder, L. B., J. A. Priddy, and J. R. Walters. 1998. Demographic isolation of red-cockaded woodpecker groups: a model analysis. Project Final Report, prepared for U.S. Fish and Wildlife Service.
- Daniels, S. J., and J. R. Walters. 2000. Between-year breeding dispersal in red-cockaded woodpeckers: multiple causes and estimated cost. *Ecology* 81:2473-2484.
- Department of the Army, 2007. Management Guidelines for the Red-cockaded Woodpecker on Army Installations. 27pp.
- Department of the Army, 2019. Fort Bragg Endangered Species Management Component. Fort Bragg, NC.
- Doresky, J.K., Morgan, L. Ragsdale, H. Townsend, M. Barron and M. West. 2001. Effects of military activity on reproductive success of red-cockaded woodpeckers. *Journal of Field Ornithology*. 72(2): 305-311
- Delaney, D., K. Larry L. Pater, Robert J. Dooling, Bernard Lohr, Beth F. Brittan-Powell, Linton L. Swindell, Tim A. Beaty, Larry D. Charlie, Eric W. Spadgenske, Bruce A. MacAllister, and Robert H. Melton. 2002. Assessment of Training Noise Impacts on the Red-Cockaded Woodpecker: 1998-2000.
- Delaney, D.K., L.L. Pater, R.J. Dooling, E.F. Brittan-Powell, T.A. Beaty, L.D. Carlile, E.W. Spadgenske, B.A. Macallister and R.H. Melton. 2004. Pages 141-142 *in* Red-cockaded Woodpecker: Road to Recovery, Red-cockaded Woodpecker Symposium IV, 27-31 January 2003, Savannah, GA.
- Haddad, N., B. Bartel, D. Kuefler, and J. Abbott. 2007. Research for Maintenance of Saint Francis' Satyr Butterfly Population at Fort Bragg. Report prepared for the Fort Bragg Endangered Species Branch.
- Hall, S.P. 1993. A Rangewide Status Survey of Saint Francis' Satyr (Lepidoptera: Nymphalidae). Report to the U.S. Fish and Wildlife Service, Southeast Region, Asheville Ecological Services Field Office.
- Hall, S.P. and E.L. Hoffman. 1994. Supplement to the Rangewide Status Survey of Saint Francis' Satyr, *Neonympha mitchellii francisci*, (Lepidoptera: Nymphalidae), 1993 Field Season. Report to the U.S. Fish and Wildlife Service, Southeast Region, Asheville Ecological Services Field Office.

Hall, S.P. 2003. Survey for the Saint Francis' Satyr (*Neonympha mitchellii francisci*) and Associated Ecosystems at Fort Bragg Exclusive of Artillery Impact Areas. Report to the Fort Bragg Endangered Species Branch.

Hayden, T.J., R.H. Melton, B. Willis, L.B. Martin, III and T. Beaty. 2002. Assessment of effects of maneuver training activities on the red-cockaded woodpecker populations on Fort Stewart, Georgia. US Army Corps of Engineers, CERL Technical report 02/17. 74 pp. GA

Henry, G, U.S Fish and Wildlife Service. 1989. Guidelines for preparation of biological assessments and evaluations for the red-cockaded woodpecker.

Hooper, R. G., and M. R. Lennartz. 1995. Short-term response of a high density red-cockaded woodpecker population to loss of foraging habitat. Pages 283-289 in D. L. Kulhavy, R. G. Hooper, and R. Costa, editors. Red-cockaded woodpecker: recovery, ecology and management. Center for Applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA.

James, Hess, and Kufirin. 1997. Species-Centered environmental analysis: Indirect effects of fire history on red-cockaded woodpeckers. *Ecological Applications*, 7 (1), PP. 118-129. Citation incomplete

Kesler, D. C., J. R. Walters, and J. J. Kappes. 2010. Social influences on dispersal and the fat-tailed dispersal distribution in red-cockaded woodpeckers. *Behavioral Ecology* 21:1337-1343.

Letcher, B.H., J.A. Priddy, J. R. Walters and L.B. Crowder. 1998. An individual-based, spatially-explicit simulation model of the population dynamics of the endangered red-cockaded woodpecker. *Biological Conservation* 86:1-14.

Lipscomb, D. J., and T. M. Williams. 1996. A technique for using PC-ARC/INFO GIS to determine red-cockaded woodpecker foraging areas on private lands. Pages 255-264 in Proceedings of the southern forestry geographic information systems conference. University of Georgia, Athens, Georgia, USA.

Lipscomb, D. J., and T. M. Williams. 1998. Spatial changes in RCW management constraint areas over a ten year period on Hobcaw Barony. Pages 57-68 in SOFOR GIS '98: 2nd southern forestry GIS conference. University of Georgia, Athens, Georgia, USA.

Pasinelli, G., and J. R. Walters. 2002. Social and environmental factors affect natal dispersal and philopatry of male red-cockaded woodpeckers. *Ecology* 83:2229-2239.

Pasinelli, G., K. Schiegg, and J. R. Walters. 2004. Genetic and environmental influences on natal dispersal distance in a resident bird species. *The American Naturalist* 164:660-669.

- Perkins, J. L. 2006. Effects of military training activity on red-cockaded woodpecker demography and behavior *and* new territory formation in the cooperatively breeding redcockaded woodpecker. Masters Thesis, Virginia Polytechnic University, Blackburg, VA. 68 pp.
- Pollock, K.H., M. Alldredge, J.R. Walters, and J.J. Britcher. 2001. A Conceptual Sampling Model and its Application to the Estimation of Population Demographics for Red- cockaded Woodpeckers on Fort Bragg. Report to the Fort Bragg Endangered Species Branch.
- Rudolph, D.C., and R. N. Conner. 1991. Cavity tree selection by red-cockaded woodpeckers in relation to tree age. *Wilson Bull.* 103:458-467.
- Schafale, M. P., and A. S. Weakley. 1990. Classification of the natural communities of North Carolina, 3rd Approximation. Department of Environment and Natural Resources, Division of Parks and Recreation, NC Natural Heritage Program. 325 pages.
- U.S. Fish and Wildlife Service. 1992. Biological Opinion for the proposed construction of the Installation Materials and Maintenance Division Complex on Fort Bragg, U.S. Fish and Wildlife Service, Atlanta, GA. 24pp.
- U.S. Fish and Wildlife Service. 1995. American Chaffseed (*Schwalbea Americana*) Recovery Plan. Hadley, Massachusetts. 62 pp.
- U.S. Fish and Wildlife Service. 2003. Red-cockaded woodpecker (*Picoides borealis*) Recovery Plan: Second Revision. U.S. Fish and Wildlife Service, Atlanta, GA.
- U.S. Fish and Wildlife Service. 2005. Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: Second Revision. U.S. Fish and Wildlife Service, Atlanta, GA.
- U.S. Fish and Wildlife Service. 2006. Protocol for monitoring project related traffic disturbance to red-cockaded woodpeckers during the nesting season.
- U.S. Fish and Wildlife Service. 2008. North Carolina's Threatened and Endangered Species. U.S. Fish and Wildlife Service, North Carolina Ecological Services Division, Raleigh, NC. On-line: <http://www.fws.gov/nc-es/es/es.html>.
- Walters, J. R., P. D. Doerr, and J. H. Carter III. 1988. The cooperative breeding system of the red-cockaded woodpecker. *Ethology* 78:275-305.
- Walters, J. R., C. K. Copeyon, and J. H. Carter III. 1992. Test of the ecological basis of cooperative breeding in red-cockaded woodpeckers. *Auk* 109:90-97.
- Walters, J.R., L.B. Crowder and J.A. Priddy. 2000. Simulated population dynamics of the North Carolina Sandhills Red-cockaded Woodpecker population. Unpublished report.

Walters, J.R., S.J. Daniels, J.H. Carter III, and P.D. Doerr. 2002a. Defining quality of Red-cockaded Woodpecker foraging habitat based on habitat use and fitness. *Journal of Wildlife Management* 66:1064-1082.

Walters, J.R., L.B. Crowder and J. A. Priddy. 2002b. Population viability analysis for red-cockaded woodpeckers using an individual-based model. *Ecological Applications* 12:249-260.

Walters J.R., K. Sadler., S. J. Daniels., J.H. Carter., K.Scheigg., G. Pasinelli., and P.D. Doerr. 2004. Demographic Connections Within the Sandhills Red-cockaded Woodpecker Population. Project Final Report (Draft)

Walters, J.R. 2005a. Assessment of Proposed Spring Lake Rezoning on the Sandhills Red -cockaded Woodpecker Population. Unpublished report.

Walters J.R., B.Simmons, C. Nycum, R. Meekins. 2005b. The biology and management of the redcockaded woodpecker on Marine Base Camp Lejeune, NC: Progress toward recovery under the new management plan. Department of Biology, Virginia Tech University, Blacksburg, VA.

Walters J.R. 2021. Personnel email communication with Dr. Jeff Walters on group densities related to RCW cluster abandonment, the Group Level Analysis (GLA), Neighborhood Level Analysis (NLA) and Population Level Analysis. July 2021

11. List of Preparers

Rodney Fleming, Wildlife Biologist
Fort Bragg Environmental Management Branch
Years of Relevant Experience: 27 years

T. Kevin Crawford, Wildlife Biologist
Fort Bragg Endangered Species Branch
Years of Relevant Experience: 24 years

12. List of Contributors / Persons Consulted

Ginny Carswell, Environmental Management Branch, Fort Bragg
Erich Hoffman, Environmental Management Branch, Fort Bragg
Wolf Amacker, Range Control, Fort Bragg
Mark Murray, Range Control, Fort Bragg
Dr. Jeff Walters, Virginia Tech University
Jackie Britcher, Endangered Species Branch, Fort Bragg
Stacy Huskins, Endangered Species Branch, Fort Bragg
Kevin Crawford, Endangered Species Branch, Fort Bragg
Jessie Schillaci, Endangered Species Branch, Fort Bragg
Janice Patten, Endangered Species Branch, Fort Bragg
Kenneth Sanders, Poly, Inc.
Alicia Jackson, Dr. J. H. Carter III and Associates, Inc.
John Hammond, U.S. Fish & Wildlife Service, Raleigh Field Office

(Page left blank intentionally)

74

198

APPENDIX 1

IMBG-PWE-E

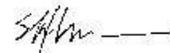
2 May, 2021

MEMORANDUM THRU CHIEF, ESB

FOR Rod Fleming, Section 7 Wildlife Biologist, EMB

SUBJECT: Rare Plant Survey for MPTR, Hoke County

1. Subject project lies in Hoke County, of which the following federally protected plant species are listed by the USFWS: Rough-leaved loosestrife *Lysimachia asperulifolia*, American chaffseed *Suhwathea americana*, Pondberry *Lindera melissifolia*, and Michaux's sumac *Rhus michauxii*. In addition, the following Species at Risk (SAR) species are being considered: Georgia leadplant *Amorpha georgiana* var. *georgiana*, Sandhills milkvetch *Astragalus michauxii*, Pickering's daisy *Stylisma pickeringii* var. *pickeringii*, Sandhills pyxle moss *Pyxidantha barbulata* var. *brevifolia*, bog spicebush *Lindera subconocosa* and Sandhills lily *Lilium pyrophitum*.
2. Site visits were made through the growing seasons of 2020 and 2021 to determine presence/absence for the above listed species in the project footprint. These visits include efforts made by Jay Carter & Associates personnel, who is conducting Fort Gregg's current rare plant survey. Habitat consists primarily of well-maintained xeric sandhill scrub and Pine-Scrub Oak Sandhill. Several known plant sites exist within the proposed MPTR.
3. Suitable habitat exists for American chaffseed, Sandhills pyxle moss and Sandhills milkvetch. The single known American chaffseed site was checked, finding that plants are present. The three known Sandhills pyxle moss sites were checked, finding that plants are present, with PYBR092B having a new occurrence outside the known boundary. No additional stems or clumps were found in the 35% footprint, although two new Sandhills pyxle moss sites were found along the boundary. In addition to these federal and Army SAR occurrences, four species of state-listed rare plants exist within the footprint: Carolina sunrose *Crocoternum carolinianum* (E), soft milk-pea *Galactia mollis* (T), narrowleaf bluecurls *Trichostema setaceum* (SR), and Batesburg hawthorn *Crataegus munda* (SR). It is anticipated that the execution of this project as proposed will result in the destruction of these rare plant occurrences.



STACY D. HUSKINS

Botanist, ESB

Appendix 1

(Page left blank intentionally)

Appendix 1

APPENDIX 2

RCW Forage Assessment Reports will be provided electronically for the following 18 RCW Clusters:

Cluster
22
110
111
112
113
114
115
149
151
152
167
194
251
271
272
452
560
603

(Page left blank intentionally)

Appendix 2

APPENDIX 3

31 AUG 21

MEMORANDUM THRU CHIEF, ESB

FOR Wolf Amacker, Installation Range Office, Range Operations, DPTMS

SUBJECT: Discussion and Development for Red-cockaded Woodpecker (RCW) Monitoring Plans for Multi-Purpose Training Range (MPTR), McPherson Impact Area

1. The MPTR Biological Assessment identifies 12 RCW clusters that will be considered "take" either through loss of habitat or noise levels disrupting roosting and nesting behaviors. These environmental impacts require a level of RCW monitoring to verify the analysis and allow for observations for other adverse impacts resulting from construction and operation of this range.

2. The Endangered Species Branch (ESB) has developed a monitoring plan identifying clusters within 1.25 miles of the MPTR clearing footprint. Six of the 12 "take" clusters, external to the range clearing area, where active cavity trees are expected to remain on the landscape, will be monitored. Twenty-one other monitored clusters are located either within the "non-dudded" area around the MPTR or within the Training Area (TA).

In total, 27 clusters will require monitoring, resulting from the MPTR project. Twenty of the 27 clusters will require access from Range Control into the "non-dudded" area around the MPTR. Seven clusters are found in the TA.

DFL & ROCA	Access	TA
110	22	75
112	53	172
113	109	195
194	146	252
251	149	253
603	151	254
	167	451
	219	
	255	
	256	
	269	
	273	
	452	
	1029	
6	14	7

3. A meeting was held on 31 AUG 21 at Range Operations (RO) with members of DPW Environmental Division (ENVDIV) and DPTMS Range Operations. The following individuals were in attendance:

- Jackie Britcher, ESB Chief
- Rod Fleming, ENVDIV MPTR Biological Assessment Lead
- Erich Hoffman, EMB Section 7 Biologist
- Jessie Schillaci, ESB, RCW Monitoring Program Manager

Appendix 3

- Kevin Crawford, ESB, Habitat Restoration Program Manager/TLWG XO
- Wolf Amacker, Installation Range Officer, RO
- Mark Murray, Chief of Operations Office, RO
- Robert Havens, Supervisory Range Scheduler, RO

4. A map of the area identifying the MPTR range footprint (35% design), the overall MPTR Surface Danger Zone (SDZ), the 1.25 mile monitoring zone, and RCW clusters with designations for level of project impact and access needs was presented.

5. Previous communications for RCW monitoring and the designations of "take" for clusters were briefly discussed. ESB reviewed the amount of clusters with the monitoring plan and the projected number of weekly hours expected to successfully implement breeding season monitoring. A minimum estimate of sixteen (16) hours, per week, is needed to monitor the 20 clusters within the "non-dudded" area surrounding the MPTR, starting in April thru July. Additional access may be required later for adult banding. Because this area lies within the MPTR SDZ, access will need to be coordinated with RO.

6. Monitoring is expected to be implemented using a contract modification to the established monitoring contract. ESB will coordinate access SOPs with the monitoring contractor and communication with RO personnel.

7. Range Operations will work with ESB for access into the "non-dudded" area de-conflicting for scheduled military training/operations of the range. The Installation Range Officer expects the range to be used heavily due to range type and weapons qualification capability.

8. Standard days and times are the preferred method for access into these area, along the same SOPs for other "non-dudded" areas, Monday 0600-1000 hours. RO also allows for Friday access, from 0600-1000. Utilizing these two periods should account for 50% of time needed for monitoring.

For the remaining estimated eight hours, RO suggested weekend access as a likely approach to de-conflict with military training, which will need to be included in contract. Additional access periods could coincide with maintenance days/periods. ESB will regularly coordinate through the Range Facility Management Support System (RFMSS) and communication with the Chief of Operations or Supervisory Range Scheduler.

9. Standardizing the schedule of any maintenance days during the week would benefit the monitoring plan and access. At this point (the 35% design and BA development) the exact use and maintenance needs of the MPTR is difficult to forecast. RO expressed an understanding of the importance of the RCW monitoring and desire to work towards resolving access issues to facilitate the monitoring.

10. Results of this meeting:

- ESB will initially plan for MPTR access on Monday and Friday, from 0600-1000 hrs. For Mondays and Fridays without scheduled training on the MPTR, access could be extended (beyond 1000 hrs.). As the range construction/operation advances, ESB will coordinate with RO on other specific times for maintenance or standardized days for access.

Appendix 3

- Clusters within the "non-dudded" areas, but outside of the MPTR SDZ do not require RO access, however RO requests a notification to RO Radio Room when working in the these areas. ESB will provide a hand-held radio to the contractor. There are eight clusters (53, 54, 219, 220, 221, 251, 255, and 387) within the "non-dudded" area, but outside of the SDZ.

T. Kevin Crawford
Habitat Restoration Program Mgr.
Endangered Species Branch;
TLWG XO

Representatives from Range Operations and Endangered Species Branch met to discuss and develop the above monitoring plan. I acknowledge and concur with this plan and associated contracted actions and estimated costs.

Wolf Amacker
Range Operations
Installation Range Officer

Wolf Amacker

Jacqueline J. Britcher
Environmental Division
Chief, Endangered Species Branch

HEINS.DAVID.ALEXA
NDER.119748689

Digitally signed
HEINS.DAVID.ALEXANDER.1197
4 86895
Date: 2021.11.23 15:33:40 -

Appendix 3

BA Addendum attached to 9 March 2022 e-mail to the FWS from the Fort Bragg DPW EMB

Addendum to the Biological Assessment (BA) for the Construction of the Multipurpose Training Range (MPTR) at Fort Bragg Military Installation, North Carolina

The addendum is required to annotate changes in the clearing limits as part of the 65% design submittal. Design requirements associated with construction of the Range Operations and Control Area (ROCA) has necessitated the clearing limits to move further south causing additional impacts to Cluster 251. The following outlines changes in the BA that are related to additional impacts to Cluster 251:

- 1) Page 28. Table 3 (see amended Table below). FHA Summary has been updated to reflect changes to removal of PGQFH within Cluster 251. Column for partition #251 amended: PGCFH Pre-project changed from 209.69 to 217.60 acres, Project Removal (PGQFH) changed from 47.54 to 48.11 acres, % removal changed from 22.7% to 22.1%, and PGQFH Post-Project changed from 161.79 to 169.49. Note: Pre-project PGQFH increased because a cavity tree within cluster 272 was removed from management which changed the cluster centroid, shifting the partition and adding approximately 8 acres to cluster 251.
- 2) Page 29. Eleven cavity trees within cluster 251 will be lost from clearing of the range.
- 3) Pages 31, 32 and 33. Table 4 amended to summarize the direct impacts to RCW cavity trees within cluster 251 (see amended Table below).
- 4) Pages 34, 35 and 36. Delete sentences referencing Cluster 251, located on the southern portion of the MPTR being affected by noise/harassment from construction and operations. Change sentence to "Eleven cavity trees with cluster 251 will be lost from clearing."
- 5) Page 37. Figure 12 amended to reflect changes in clearing limits within cluster 251 and removal of all eleven cavity trees (See amended Figure below).
- 6) Page 47. Delete sentence "The additional loss of four cavity trees within cluster 251 will occur from clearing of the range."
- 7) Page 58. Amend 4th paragraph to read "It is anticipated that all eleven cavity trees within cluster 251 will be removed. Although the project will remove 48.11 acres (22.1%) of PGQFH within the cluster, 169.49 acres of PGQFH will remain post project. Fort Bragg Endangered Species Branch biologists, will provision (where applicable) additional cavity trees south of the ROCA in attempt to maintain cluster 251 on the landscape."
- 8) Page 63. Amend 4th sentence within Monitoring section to read "This comprises 12 clusters with proposed "take"; seven within the range footprint (111, 114, 115, 152, 251, 271 and 272) and five additional within the direct-fire line (110, 112, 113, 194 and 603)."
- 9) Page 65. Amend 2nd sentence to read "Currently, five clusters (110, 112, 113, 194, and 603) are projected to retain enough cavity trees for monitoring."
- 10) Page 66. Red-cockaded Woodpecker section to read:

The impact analysis, through an FHA, a GIS analysis, and field evaluations considered: direct, indirect, interdependent/interrelated and cumulative impacts as they pertain to the forage habitat requirements; forest fragmentation; RCW harm/harassment/disturbance; demographics through group isolation; and impacts to roosting/nesting habitat.

RCW cavity trees and/or foraging habitat will be impacted in 18 active RCW clusters as a result of the construction and operation of the MPTR. FHAs were completed on all 18 clusters. Twelve

of the eighteen clusters did not meet SMS and will be directly “taken” by loss of forage and/or cavity tree impacts from the proposed project.

Clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272 and 603 will be directly impacted and incur substantial loss to forage habitat that would likely adversely affect or “Take” these clusters as a result of clearing or direct fire impacts. Six additional clusters (clusters 22, 149, 151, 167, 251, and 560) will incur some loss of forage habitat but will retain >120 acres of PGQFH post-project. Cluster 452 will retain <120 acres of PGQFH (108.6 acres) but will incur minimal forage loss (0.7%) post-project.

Ninety one (91) cavity trees within eight RCW clusters will be lost from clearing within the range footprint. Sixty-three (63) cavity trees are anticipated to be lost within six clusters from the direct firing of munitions over time. In addition, two inactive cavity trees within cluster 149, one advanced start tree within cluster 603, one start tree within cluster 452 and one tree no longer managed are anticipated to be lost within the DA. Clusters 149 and 452 will retain enough suitable cavities for viable roosting and nesting.

During construction and operations phases of the project, there will be noise created from vehicles, heavy machinery, personnel, live fire activities and etc. within the project area. Noise related impacts will vary in intensity, frequency and duration and will depend on the type of activity. RCW clusters 167 and 273 are the only clusters adjacent to the MPTR that would be in close proximity that potentially could be affected by noise or harassment. The closest point along the course road or battle position where live firing will occur from the nearest cavity tree within RCW clusters 167 and 273 is approximately 1,700 ft and 1,800 ft respectively. It is anticipated that construction and operational activities will not affect RCW behavior during roosting and nesting within these two clusters.

No adverse impacts are anticipated at the group or neighborhood levels which would affect dispersal or group fitness in the remaining population. With the expected “take” of 12 RCW groups after the construction and operation of the MPTR, Fort Bragg will be able to manage approximately 450 PBG’s, well above the population recovery goal established in the 2003 RCW Recovery Plan.

Table 1. FHA Summary

Project Area	Partition #	Status	PGQFH Pre-Project	Project Removal (PGQFH) Range & DFL	% Removal	PGQFH Post-Project
Direct Fire	22	ACT	275.19	0	0.0%	275.19
Range/Direct	110	ACT	68.13	53.93	79.2%	14.2
Range/Direct	111	BRE	108.22	108.22	100.0%	0
Range/Direct	112	BRE	45.92	45.92	100.0%	0
Range/Direct	113	BRE	207.21	205	98.9%	2.21
Range	114	BRE	82.86	82.86	100.0%	0
Range/Direct	115	BRE	153.81	118.44	77.0%	35.37
Direct Fire	149	BRE	225.56	16.57	7.3%	208.99
Direct Fire	151	BRE	197.91	1.3	0.7%	196.61
Range/Direct	152	BRE	121.02	112.24	92.7%	8.78
Direct Fire	167	BRE	209.69	1.1	0.5%	208.59
Range/Direct	194	BRE	157.88	156.81	99.3%	1.07
Range	251	BRE	217.60	48.11	22.1%	169.49
Range	271	BRE	143.62	103.56	72.1%	40.06
Range	272	BRE	233.11	165.94	71.2%	67.17
Direct Fire	452	BRE	109.33	0.73	0.7%	108.6
Direct Fire	560	ACT	168.49	33.31	19.8%	135.18
Range/Direct	603*	BRE*	105.72	63.22	59.8%	42.5
*2021 Data 18						
Total: Acres			2,823.00	1,317.26	46.5%	1,514.01
						1,514.01

Post Acres	Habitat
Clusters > 120	6
Clusters > 75 < 120	1
Clusters < 75	11

TAKE

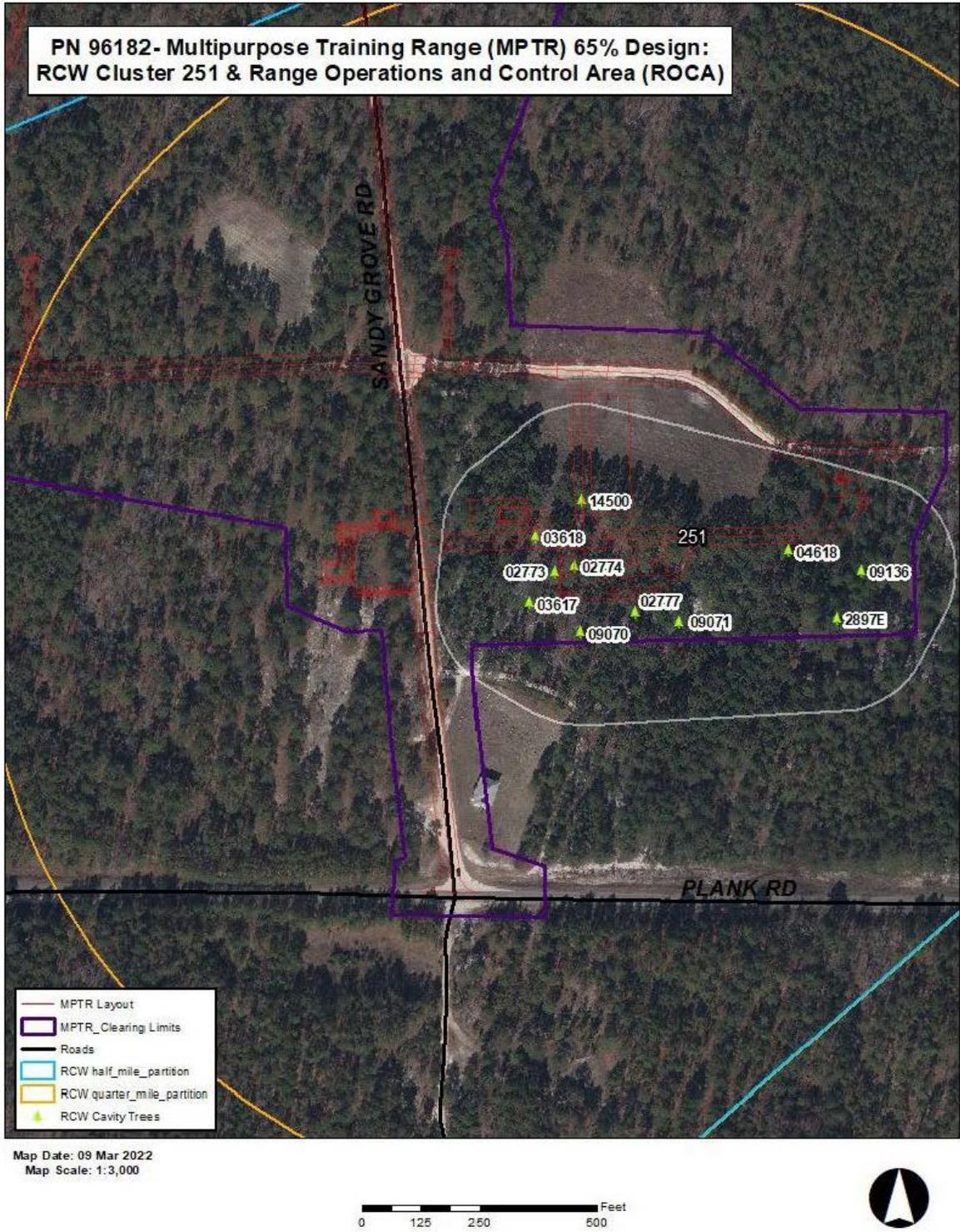
Table 2. RCW Cavity Tree Analysis

Range Clearing													
Cluster: Total Trees	Cluster #	Tree #											
17	111	2597	2598	2600	5078	5080	5090	5450	9105	9916	10289	11520	11521
# Impacted	17	12760	18208	1946E	1990E	2672E							
% Removal	100.0%												
16	114	0209E	0210E	2795	3400	4666	5430	5431	5432	9047	9109	9264	9995
# Impacted	16	18071	2842E	3202E	3203E								
% Removal	100.0%												
17	115	2801	2811	2814	6556	9450	9947	9976	11901	12843	1625E	1626E	1627E
# Impacted	13	2827E											
% Removal	76.5%												
9	152	9491	9492	9909	9977	10705	12888	2349E	2350E	2399E			
# Impacted	9												
% Removal	100.0%												
13	194	18292											
# Impacted	1												
% Removal	7.7%												
12	251	2774	3618	4618	14500	2773	3617	9070	2777	9071	2897E	9136	
# Impacted	11												
% Removal	100.0%												
15	271	0182E	0184E	2803	2804	2805	2806	2807	2808	5048	12724	14820	18004
# Impacted	15	2728E	2825E	2826E									
% Removal	100.0%												
9	272	2765	2766	3048	4620	4642	12838	18003	2425E	2449E			
# Impacted	9												
% Removal	100.0%												

Direct Firing Line													
Cluster:	Cluster #	Tree #											
Total Trees													
19	110	198E	2609	2610	2611	3613	5002	5079	9110	9234	9479	9910	9952
# Impacted	19	9983	1734E	1735E	18209	2003E	3063E	3064E					
% Removal	100.0%												
5	112	5073	5074	9233	18212	18213							
# Impacted	5												
% Removal	100.0%												
12	113	2794	4650	5050	9266	12139	12803	1415E	18079	1818E	18207	1989E	2147E
# Impacted	12												
% Removal	100.0%												
17	115	18242	18243	18244									
# Impacted	3												
% Removal	5.9%												
13	194	2615	2617	9235	9918	1156E	1157E	12733	1392E	1393E	18293	2671E	2727E
# Impacted	12												
% Removal	92.3%												
9	603	2593	2594	2596	5486	9997	1947E	2828E	2829E				
# Impacted	8												
% Removal	88.9%												
Not Mngd	2500	2601	2618	2793	3649								
# Impacted	4												
% Removal	N/A												

Dispersion			Tree #
Cluster: Total Trees	Cluster #		
14	603		9086
# Impacted	1		
% Removal	7.1%		
16	149		2622
# Impacted	2		2832
% Removal	6.3%		
13	452		12753
# Impacted	1		
% Removal	7.7%		
Not Mngd	2500		2621
# Impacted	1		
% Removal	N/A		

Figure 1. RCW Cluster 251 Cavity Tree Proximities to MPTR



Inclusion V: FWS BA Acknowledgment and BO

BA Acknowledgement Letter



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

January 26, 2022

Ms. Monica A. Stephenson
Department of the Army
U.S. Army Installation Management Command
Headquarters, United States Army Garrison, Ft Bragg
2175 Reilly Road, Stop A
Fort Bragg, North Carolina 28310-5000

Dear Ms. Stephenson:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) December 1, 2021, receipt of your November 24, 2021, letter requesting initiation of formal section 7 consultation under the Endangered Species Act. The consultation concerns the possible effects of construction and operation of the proposed Multipurpose Training Range at Fort Bragg Military Reservation in Hoke County, North Carolina. Fort Bragg has determined that the proposed project may affect, and is likely to adversely affect the red-cockaded woodpecker (*Picoides* [= *Dryobates*] *borealis*), and American chaffseed (*Schwalbea Americana*) and will have no effect on the Saint Francis' satyr (*Neonympha mitchellii francisci*), rough-leaved loosestrife (*Lysimachia asperulifolia*), and Michaux's Sumac (*Rhus Michauxii*). Our comments are provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 et seq.).

Attached to your November 24, 2021, letter is the November 2021 Biological Assessment (BA) titled "Biological Assessment For The Construction and Operation of the Multipurpose Training Range (MPTR)." Based on our review of the BA, including the proposed forest management and conservation measures that are considered part of the project, the effects of the action will involve adjacent training areas outside of the actual range construction area. For this reason, we believe the proposed action may affect, but is not likely to adversely affect the St. Francis' satyr, rough-leaved loosestrife or Michaux's sumac.

All information required of you to initiate consultation is contained in the November 2021 Biological Assessment For The Construction and Operation of the Multipurpose Training Range (MPTR) or is otherwise accessible for our consideration and reference. We have assigned log number 04EN2000-2022-F-0650 to this consultation. Please refer to that number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our biological opinion no later than April 15, 2022.

The Service recognizes the substantial roles Fort Bragg Military Reservation performs both in providing the environment for military training essential for the combat readiness of the XVIII Airborne Corps, and as a steward of high-quality natural resources for the benefit of Soldiers and the American people.

If you have any questions regarding this matter, please contact Mr. John Hammond at (919) 856-4520 (ext.28). Thank you for your continued cooperation with our agency.

Sincerely,

 Digitally signed
by PETER
BENJAMIN
Date: 2022.01.26
09:51:07 -05'00'

Pete Benjamin
Field Supervisor

Biological Opinion
**Construction and Operation of the Multipurpose Training
Range (MPTR)**
At Fort Bragg Military Installation, North Carolina
FWS Log #: 04E2000-2022-F-0650



Prepared by:

U.S. Fish and Wildlife Service
Raleigh Ecological Services
551-F Pylon Drive
Raleigh, North Carolina 27606

A handwritten signature in black ink, appearing to read "P. Benjamin".

Digitally signed by
PETER BENJAMIN
Date: 2022.06.14
16:45:35 -04'00'

June 14, 2022

Pete Benjamin, Field Supervisor

Date

TABLE OF CONTENTS

EXECUTIVE SUMMARY iii
CONSULTATION HISTORY vi
BIOLOGICAL OPINION 1
1. INTRODUCTION..... 1
2. PROPOSED ACTION 2
 2.1. *Range Construction* 2
 2.2. *Range Operation*..... 3
 2.3. *Avoidance and Minimization*..... 3
 2.4. *Pine thinning and Midstory Hardwood Removal*..... 4
 2.5. *Monitoring*..... 5
 2.6. *Other Activities Caused by the Action*..... 6
 2.7. *Action Area*..... 6
3. SOURCES OF CUMULATIVE EFFECTS 8
4. Red-cockaded woodpecker 8
 4.1. *Status of the Red-cockaded Woodpecker* 8
 4.2. *Environmental Baseline for the Red-cockaded Woodpecker*..... 17
 4.3. *Effects of the Action on the Red-cockaded Woodpecker* 23
 4.4. *Cumulative Effects on the Red-cockaded Woodpecker* 36
 4.5. *Conclusion for the Red-cockaded Woodpecker* 36
5. American chaffseed..... 44
 5.1. *Status of American chaffseed* 44
 5.2. *Environmental Baseline for American chaffseed* 62
 5.3. *Effects of the Action on American Chaffseed*..... 64
 5.4. *Conclusion for American chaffseed* 65
6. INCIDENTAL TAKE STATEMENT 67
7. CONSERVATION RECOMMENDATIONS 74
8. REINITIATION NOTICE 75
9. LITERATURE CITED..... 76

EXECUTIVE SUMMARY

This Endangered Species Act (ESA) Biological Opinion (BO) of the U.S. Fish and Wildlife Service (Service) addresses the Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina (the Action). Fort Bragg proposes to construct and conduct live fire activities on an automated training range. The range would enable three Infantry Brigade Combat Teams (IBCT) to train with the new mobile protected firepower (MPF) vehicles on the installation.

Fort Bragg determined that the Action is likely to adversely affect the red-cockaded woodpecker and American chaffseed and requested formal consultation with the Service. The BO concludes that the Action is not likely to jeopardize the continued existence of this species. This conclusion fulfills the requirements applicable to the Action for completing consultation under §7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, with respect to these species and designated critical habitats.

The Service determined that the Action is not likely to adversely affect the Saint Francis' satyr, rough-leaved loosestrife or Michaux's sumac by letter dated January 26, 2022.

The proposed action is the construction and operation of an automated training range that would support use of mounted vehicles including the new mobile protected firepower (MPF) vehicle. The range would enable three Infantry Brigade Combat Teams (IBCT) to train with MPF vehicles on the installation. The MPF is capable of firing 105 millimeter (mm) or 120 mm rounds following gunnery standard for the mobile gun system (MGS or M1). Range construction and operation will require removal or destruction of about 1,317.26 pine-forested acres.

The American chaffseed element occurrence adversely affected by the Action (SCAM023A) is one of 17 known to occur on Fort Bragg. The spatial extent of the element occurrence, 1.4 acre, is less than one percent of the total acreage on the installation populated by this species (605.17 acres). Plant count within SCAM023A has declined from a high of 67 individuals in 2012 to eight in 2021. The decline may be due in part to lower fire frequency than other element occurrences that are closer to or within installation impact areas. After reviewing the status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of the American chaffseed.

The proposed action will include focused natural resource management activities to minimize and avoid impacts to the federally listed red-cockaded woodpecker and improve its resilience within and adjacent to the action area. The installation will apply pine timber thinning and hardwood midstory control to sustain and re-establish ecological conditions over 3,743 acres, to improve habitat conditions for the red-cockaded woodpecker and associated native open woodland species.

Fort Bragg will use cluster management techniques to reduce effects to individual RCWs as a result of the loss of active cavity trees and supporting nesting and foraging habitat. Fort Bragg

planners will evaluate stand characteristics in RCW foraging partitions directly affected by range construction and operation, as well as in neighboring/nearby partitions to determine where replacement cavities may be installed to provide shelter for RCWs displaced by the range. Fort Bragg will continue to protect, monitor, and provision (where applicable) clusters that are incidentally taken by the proposed action for at least five years post-construction.

The 12 PBGs that will be lost as a result of the Action are members of a well-managed portion of the Sandhills East Primary Core Recovery Population residing on Fort Bragg. Fort Bragg's initial recovery goal was set at 436 active clusters in 2003 (Service 2003). With over 460 active clusters, the installation contains about 83% of the Sandhills East Primary Core Recovery Population and over 63% of the combined Sandhills East Primary Core and Sandhills West Essential Support Populations. NC Sandhills East is one of 13 primary core recovery populations, and Sandhills West is one of 16 essential support populations identified in the Recovery Plan.

Out of 124 RCW populations analyzed in the RCW SSA Report (Service 2020), the North Carolina Sandhills population (including both the Sandhills East Primary Core and Sandhills West Essential Support populations) is one of only three populations classified with very high resilience. Redundancy of very high (3) and high (3) resilience populations is low. Only two ecoregions, the East Gulf Coastal Plain and the Sandhills have more than one population that are classified as of high or very high resilience, and only these two regions have more than two populations classified as moderate to very high resilience.

Of the 13 ecoregions with current populations, those with high (3) and very high resilience (3) are restricted to only four regions: Mid-Atlantic Coastal Plain, East Gulf Coastal Plain, South Atlantic Coastal Plain, and Sandhills. Only two ecoregions, the East Gulf Coastal Plain and the Sandhills, have more than one population classified as of high or very high resilience, and only these two regions have more than two populations classified as moderately to very high resilience. Only four ecoregions (South Atlantic Coastal Plain, Mid-Atlantic Coastal Plain, West Gulf Coastal Plain, Upper East Gulf Coastal Plain) have two populations of moderate to high resilience, and thus some level of redundancy in terms of relatively resilient populations. All of the populations in six ecoregions (Cumberland Ridge and Valley, Florida Peninsula, Gulf Coast Prairie Marshes, Mississippi River Alluvial Plain, Ouachita Mountains, and Piedmont) are of low or very low resilience, but are important for representation in their respective regions and across the range. Redundancy in the Sandhills Ecoregion is notable because of six different populations, two are in the high and very high resilience category.

Impacts of the proposed Action on the RCW are limited to the managed RCW subpopulation on Fort Bragg comprised of between 450 and 460 active RCW clusters. Removal and destruction of 1,317.26 acres of pine-forested habitat and 159 cavity trees, will result in the loss of about 36 to 40 individual RCWs comprising 12 PBGs within Fort Bragg's habitat management areas. Up to 20 additional individual RCWs residing in clusters/territories indirectly affected by the proposed action will be taken as a result of usurpation by RCWs displaced by direct loss of habitat. The proposed Action will measurably contribute to habitat fragmentation already present both inside and outside of the Action Area. However, sufficient habitat connectivity will remain to support adequate transfer of naturally dispersing RCWs seeking breeding vacancies in neighboring PBGs.

Pine thinning and midstory removal within the Action Area will enhance the residual habitat's ability to support RCW groups in the analysis neighborhood peripheral to the 12 PBGs lost in the proposed action. Protection of high quality, mature pine trees may enable the Action Area to retain one or two PBGs directly affected by habitat loss. Cluster management associated with the Action may reduce genetic and demographic loss of individual RCWs from the population.

Ecosystem management as outlined in the INRMP, and subordinate plans, including an active prescribed burning program, has enabled the growth and sustainment of the Sandhills East Primary Core Recovery Population and is essential to maintaining this recovery unit. No less important is the protection of high quality, mature pine trees throughout the installation's 105,629-acre ecological habitat matrix, which will be essential to expanding the landscape's capacity to sustain PBGs that may count toward installation recovery goals.

The Action will reduce Fort Bragg's RCW population size from about 461 estimated PBGs to 449 PBGs. This reduction in numbers of PBGs or acreage managed for RCW conservation will not significantly impede the installation's ability to sustain a RCW population meeting recovery criteria. After reviewing the status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of the RCW.

The BO includes an Incidental Take Statement (ITS) that requires Fort Bragg to implement reasonable and prudent measures that the Service considers necessary or appropriate to minimize the impacts of anticipated taking on the listed species. Incidental taking of listed species that is in compliance with the terms and conditions of this statement is exempted from the prohibitions against taking under the ESA.

The proposed Action includes monitoring activities essential for tracking impacts of the overall Action on the red-cockaded woodpecker. Fort Bragg's monitoring plan will track vital functions of 33 PBGs within the 1.25-mile radius of the range clearing and area identified as the Direct Firing Line, including the 12 PBGs that would be adversely affected by the action. Monitoring and reporting will also include tracking of active, completed cavities removed for site preparation and range construction, as well as artificial cavity trees provisioned as part of minimization and avoidance for the Action. Monitoring reports should be submitted to the Service by March 31 of the following year.

In the Conservation Recommendations section, the BO outlines voluntary actions that are relevant to the conservation of the listed species addressed in this BO and are consistent with the authorities of Fort Bragg.

- Develop and implement a translocation plan for juvenile RCWs produced by groups subject to incidental take as a result of the Action. The plan may prioritize placement of post-fledging birds with unpaired RCWs with suitable territories or into recruitment clusters within the NC Sandhills population. Translocations into other populations or to establish new populations may also be considered.

- Conduct research to better understand population dynamics where territories are densely aggregated and how to conserve this population in the face of adverse habitat change.
- Expand monitoring for potential group level effects to territories outside of the 1.25-mile radius of the effects footprint and into the neighborhood analysis area (3.7-mile dispersal range). Examine for effects of emigrating birds displacing existing members of existing groups, filling breeding vacancies, etc.
- Conduct pre- and post-Action group composition checks in all (or as many) accessible active clusters in the analysis neighborhood (3.7-mile radius around the area of adverse effects) as practicable. Following initial range clearing, conduct morning follows and roost checks for RCWs that were displaced by habitat loss.

Reinitiating consultation is required if Fort Bragg retains discretionary involvement or control over the Action (or is authorized by law) when:

- (a) the amount or extent of incidental take is exceeded;
- (b) new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this BO;
- (c) the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
- (d) a new species is listed or critical habitat designated that the Action may affect.

CONSULTATION HISTORY

This section lists key events and correspondence during the course of this consultation. A complete administrative record of this consultation is on file in the Service's Raleigh Ecological Service Field Office.

- | | |
|------------|--|
| 2022-05-25 | Rod Fleming of Fort Bragg's Directorate of Public Works sent an email to John Hammond of the Service's Raleigh Field Office (RFO) stating that Fort Bragg had reviewed the Service's Draft Reasonable and Prudent Measures and Terms and Conditions proposed for inclusion in the Final Biological Opinion and indicated that Fort Bragg would be able to incorporate them into the proposed action. |
| 2022-05-25 | The Service's Raleigh Field Office submitted a Microsoft Word file by email to Fort Bragg containing Draft Reasonable and Prudent Measures and Terms and Conditions proposed for inclusion in the Final Biological Opinion for the Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina. The RPMs and T&Cs are intended to further minimize loss of red-cockaded woodpecker groups and individual red-cockaded woodpeckers associated with habitat loss. |

2022-05-20 Messrs. Rod Fleming and Kevin Crawford of Fort Bragg's Endangered Species Branch spoke by phone with John Hammond of the Service's Raleigh Field Office to refine development of Reasonable and Prudent Measures and Terms and Conditions that would be included in the final Biological Opinion.

2022-05-18 John Hammond of the Service's Raleigh Field Office (RFO) sent Rod Fleming of Fort Bragg's Directorate of Public Works an email listing Draft Reasonable and Prudent Measures for discussion.

2022-05-04 In a phone conversation, John Hammond of the Service's Raleigh Field Office informed Rod Fleming of Fort Bragg's Directorate of Public Works that the Service recommended preparation of Reasonable and Prudent Measures/Terms and Conditions to further minimize impacts to red-cockaded woodpeckers during the breeding season and to reduce loss of red-cockaded woodpeckers. Mr. Fleming approved the RFO's preparation of draft RPMs/ T&Cs.

2022-04-18 Rod Fleming of Fort Bragg's Directorate of Public Works sent an email to John Hammond of the Service's Raleigh Field Office (RFO) acknowledging receipt of the Service's response to the Fort Bragg's Microsoft Excel file containing Fort Bragg's comment matrix on the Service's Draft Biological Opinion for the Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina. Mr. Fleming indicated that Fort Bragg was satisfied with the Service's responses to Fort Bragg's comments and recommended changes to the draft Biological Opinion.

2022-04-14 The Service's Raleigh Field Office electronically returned Fort Bragg's Microsoft Excel file containing the installation's comment matrix on the Service's Draft Biological Opinion for the Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina to the Service's Raleigh Field Office (RFO), with the Service's response to Fort Bragg's comments.

2022-04-13 Fort Bragg transmitted an Microsoft Excel file containing Fort Bragg's comment matrix on the Service's Draft Biological Opinion for the Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina to the Service's Raleigh Field Office (RFO), along with Fort Bragg's response to RFO's question about conservation of American chaffseed in the Action Area.

2022-04-08 The Service's Raleigh Field Office submitted a Microsoft Word file by email to Fort Bragg containing a Draft Biological Opinion for the Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina.

- 2022-03-09 Fort Bragg submitted an addendum to the December 1, 2021, Biological Assessment. The addendum was provided to update the analysis of the clearing limits as necessary to account for changes in the 65% design submittal.
- 2022-02-16 Rod Fleming of Fort Bragg's Directorate of Public Works sent an email to John Hammond acknowledging receipt of the Service's January 26, 2022 letter.
- 2022-01-26 John Hammond of the Service's Raleigh Field Office electronically transmitted a January 26, 2022, letter confirming receipt of Fort Bragg's November 24, 2021, letter and "Biological Assessment For The Construction and Operation of the Multipurpose Training Range (MPTR)," received electronically on December 1, 2021. The Service determined that the proposed Action may affect, but is not likely to adversely affect the St. Francis' satyr, rough-leaved loosestrife or Michaux' sumac.
- 2021-12-01 Mr. Rod Fleming, Directorate of Public Works provided an email to the Service containing an electronic version of Fort Bragg's November 24, 2021, letter requesting formal consultation on proposed Construction and Operation of the Multipurpose Training Range. Mr. Fleming also provided a link to download the final biological assessment from a web link: "Biological Assessment For The Construction and Operation of the Multipurpose Training Range (MPTR)."
- 2021-09-02 John Hammond of the Service's Raleigh Field Office provided comments on the draft biological assessment by email. The Service provided Fort Bragg with a web link to our agency's "Species Status Assessment Report For the Red-cockaded Woodpecker (*Picoides borealis*) Version 1.3" and made recommendations for assessing neighborhood level impacts expected as a result of proposed Action.
- 2021-08-13 Mr. Rod Fleming, Directorate of Public Works emailed a pdf containing a draft "Biological Assessment For The Construction and Operation of the Multipurpose Training Range (MPTR) At Fort Bragg Military Installation, North Carolina" to John Hammond of the Service's Raleigh Field Office.

BIOLOGICAL OPINION

1. INTRODUCTION

A biological opinion (BO) is the document that states the findings of the U.S. Fish and Wildlife Service (Service) required under section 7 of the Endangered Species Act of 1973, as amended (ESA), as to whether a Federal action is likely to:

- jeopardize the continued existence of species listed as endangered or threatened; or
- result in the destruction or adverse modification of designated critical habitat.

The Federal action addressed in this BO is the Fort Bragg Military Installation, North Carolina's (Fort Bragg) proposed Construction and Operation of the Multipurpose Training Range (MPTR) (the Action). This BO considers the effects of the Action on the red-cockaded woodpecker and American chaffseed. The Action does not affect designated critical habitat; therefore this BO does not address critical habitat.

The Service previously determined that the Action may affect, but is not likely to adversely affect Saint Francis' satyr, rough-leaved loosestrife, and Michaux's sumac, by letter dated January 26, 2022. This determination fulfilled Fort Bragg's responsibilities for the Action under §7(a)(2) of the ESA for these species and critical habitats. We do not address further these species and critical habitats in this BO.

BO Analytical Framework

A BO that concludes a proposed Federal action is *not* likely to *jeopardize the continued existence* of listed species and is *not* likely to result in the *destruction or adverse modification* of critical habitat fulfills the Federal agency's responsibilities under §7(a)(2) of the ESA.

"Jeopardize the continued existence means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR §402.02).

"Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR §402.02).

The Service determines in a BO whether we expect an action to satisfy these definitions using the best available relevant data in the following analytical framework (see 50 CFR §402.02 for the regulatory definitions of *action*, *action area*, *environmental baseline*, *effects of the action*, and *cumulative effects*).

- a. *Proposed Action*. Review the proposed Federal action and describe the environmental changes its implementation would cause, which defines the action area.
- b. *Status*. Review and describe the current range-wide status of the species or critical habitat.
- c. *Environmental Baseline*. Describe the condition of the species or critical habitat in the action area, without the consequences to the listed species caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all

proposed Federal projects in the action area that have already undergone formal or early consultation, and the impacts of State or private actions which are contemporaneous with the consultation.

- d. *Effects of the Action.* Predict all consequences to species or critical habitat caused by the proposed action, including the consequences of other activities caused by the proposed action, which are reasonably certain to occur. Activities caused by the proposed action would not occur but for the proposed action. Effects of the action may occur later in time and may include consequences that occur outside the action area.
- e. *Cumulative Effects.* Predict all consequences to listed species or critical habitat caused by future non-Federal activities that are reasonably certain to occur within the action area.
- f. *Conclusion.* Add the effects of the action and cumulative effects to the environmental baseline, and in light of the status of the species, formulate the Service's opinion as to whether the action is likely to jeopardize species or adversely modify critical habitat.

2. PROPOSED ACTION

The Department of the Army (DA) Combined Arms Center has identified the need for a mounted gunnery range at Fort Bragg to allow for long distance live-fire use by Soldiers for both training and qualifying. The proposed action is the construction and operation of an automated training range that would support use of mounted vehicles including the new mobile protected firepower (MPF) vehicle. The range would enable three Infantry Brigade Combat Teams (IBCT) to train with MPF vehicles on the installation. The MPF is capable of firing 105 millimeter (mm) or 120 mm rounds following gunnery standard for the mobile gun system (MGS or M1).

The proposed action will include focused natural resource management activities to minimize and avoid impacts to the federally listed red-cockaded woodpecker and improve its resilience within and adjacent to the action area. The installation will apply pine timber thinning and hardwood midstory control to sustain and re-establish ecological conditions over several hundred acres, to improve habitat conditions for the red-cockaded woodpecker and associated native open woodland species.

Fort Bragg will use cluster management techniques to reduce effects to individual RCWs as a result of the loss of active cavity trees and supporting nesting and foraging habitat. Fort Bragg planners will evaluate stand characteristics in RCW foraging partitions directly affected by range construction and operation, as well as in neighboring/nearby partitions to determine where replacement cavities may be installed to provide shelter for RCWs displaced by the range. Fort Bragg will continue to protect, monitor, and provision (where applicable) clusters that are incidentally taken by the proposed action for at least five years post-construction.

2.1. Range Construction

The MPTR would be constructed south of the existing McPherson Impact Area. Construction and operation of the range will expand the McPherson Impact Area west to Rockfish Creek, east to Raeford Vass Road, and south to Plank Road. The MPTR would start north of Plank Road at Firebreak 7, expanding north and continuing across Jones Landing Zone and Chicken Road, encompassing parts of the GG1 and GG2 training areas.

Range construction would begin in FY 2023. Primary facilities include a 578-square foot (ft²) control tower, one 1,800 ft² operations facility, port-a-john pads within three-sided wind walls, a 720 ft² bleacher enclosure, 800 ft² covered mess, 1,064 ft² instrumented range after-action review building, 450 ft² ammunition loading dock, six bivouac pads (15- by 25-foot each), and unit storage. These features would be contained within the Range Operations Cantonment Area. The range would consist of six moving ammunition targets, 30 stationary targets and berms, four camera towers and two machinegun bunkers. The project would require utilities, including storm drainage, fencing, paving, electricity, and communications. Potable water will be trucked on site and a portable toilet contract will provide wastewater services.

Additional construction would include a 17,000 linear-foot, 20-foot wide tank trail; 35,000 linear-foot, eight-foot wide maintenance trail; site clearing and grading; fencing; and gravel parking area. Roads constructed for general range use will be 20 feet wide, and roads built for administrative purposes (range operations control area) will be 24 feet wide. The entire range area will be cleared of vegetation and approximately 20% of the range area (160 acres) will be grubbed.

About 152 RCW cavity trees fall within the clearing limits of the MPTR. While line of sight to targets need to be clear there may be areas within the range that will not need to be 100% cleared of pine forest. Fort Bragg personnel will work with U.S. Army Corps of Engineers (USACE) project managers and Range Operations representatives and their design firms to identify and minimize impacts where practicable.

2.2. Range Operation

MPF vehicle operators, mounted and dismounted infantry will engage a series of stationary, mobile and combination targets from numerous battle positions within the MPTR. The range will accommodate a variety of non-dud producing weapons and systems from 5.56 mm rifle and machinegun calibers to 105 mm and 120 mm for MPF objectives. The range may be used day or night throughout the year.

2.3. Avoidance and Minimization

All RCW cavities in trees designated to be cut will be screened to prevent RCWs use at the time of cutting. Cavity trees that are cut will be either destroyed onsite or collected for educational purposes with appropriate permitting from the Service. Active cavity trees will not be cut during the nesting season (April-July).

Clusters which are "taken" because of insufficient post-project foraging habitat or harassment due to projected impacts, could end up persisting on the landscape. If "take" clusters are found to remain active and productive, despite reduced foraging habitat and training disturbance, Fort Bragg may petition to have these included back into population goals. Fort Bragg will continue to protect, monitor, and provision (where applicable) clusters that are "taken" by the MPTR project for a period of no less than five years. These actions will support consultation and

decisions with the Service as to "take" cluster sustainability and inclusion towards the population's recovery goals. Any "taken" RCW clusters that remain active should aid in sustaining cluster density and population health, maintenance of demographic connectivity and continue to contribute fledglings for overall population stability and growth.

Fort Bragg will evaluate and provision habitat, where available, in adjacent forested areas where surplus acreage will be identified that could potentially allow for refuge/opportunity for displaced RCW to establish new clusters. In addition, increasing densities of groups in adjacent areas, specifically the area south of the MPTR (around clusters 252, 254, 172, 173 and 195), could also benefit in maintaining connectivity between RCW groups to the east and west of the MPTR (Walters, pers. comm. 2021).

Fort Bragg anticipates that all 11 cavity trees within cluster 251 will be removed. Although the project will remove 48.11 acres (22.1%) of potential good quality foraging habitat (PGQFH) within cluster 251's 0.5-mile foraging partition, 169.4 acres of PGQFH will remain following construction. Fort Bragg Endangered Species Branch biologists will provision (where applicable) additional cavity trees south of the ROCA in attempt to keep cluster 251's PBG extant in the landscape.

Approximately 1.15 acres of a 1.4-acre American chaffseed site fall within the project clearing limits. All trees within the 1.15-acre part of the site will need to be removed to create direct line-of-site from firing points to targets located behind the plant site. Grubbing or grading within the plant site would not be required. In order to avoid and/or minimize damage to plants from tree harvesting, individual stems will be flagged if visible prior to harvest. The Fort Bragg botanist will coordinate with the Forestry Branch and USACOE Resident Forester to develop specific methods to mitigate impacts to the site during harvesting. The boundaries of the plant site will be posted/signed and designated off limits to foot and vehicular traffic.

2.4. Pine thinning and Midstory Hardwood Removal

General forest management on Fort Bragg is guided by the Forest Management Plan, Appendix B.5.e. (FMP) of the "Integrated Natural Resources Management Plan, 2019-2023 Fort Bragg and Camp Mackall North Carolina" (Fort Bragg 2018; INRMP). For RCW conservation, the Forest Management Plan generally prioritizes stand improvements for stands within foraging partitions that contain less than 120 acres of good quality foraging habitat. These practices include retention of most of the large pines, reduction of over-stocked small pines and small hardwoods, which improves the condition of residual forest on terms of RCW foraging and nesting habitat.

The action includes prioritized scheduling of pine thinning and midstory hardwood removal to improve conditions for RCW foraging and nesting habitat within the Sandy Grove Training Area Group (TAG) which includes stands adjacent to the proposed range area. Pine stands were evaluated within the area for pine thinning and for hardwood midstory issues. Fort Bragg analyzed timber stands using the Service's RCW matrix tool and field observations to identify pine stands that could be improved. One-hundred and eighty stands were prioritized for thinning in training areas GG1, GG2, HH1, and DD3:

GG1: 47 stands (1,094 acres)
GG2: 71 stands (1,291 acres)
HH1: 53 stands (1,175 acres)
DD3: 9 stands (183 acres)

915 acres of thinning operations within Sandy Grove TAG, P01 (491 acres) and P02 (424 acres), have been completed. Sandy Grove P03 (350 acres) and Sandy Grove P04 (364 acres) have been sold. Sale areas for Sandy Grove P05 (373 acres), Sandy Grove P06 (368 acres) and Sandy Grove P07 (207 acres) have been delineated for thinning operations. All stands will be thinned in accordance with the Fort Bragg INRMP FMP once vetted and approved through the Training Lands Working Group (TLWG). Planning for timber thinning actions will continue to be adjusted, if needed, to provide optimum habitat conditions for rare species post-project.

Fort Bragg will improve habitat quality in the Sandy Grove TAG through hardwood midstory treatments to ensure it meets Standard for Management Stability (SMS) requirements, as well for managing towards the Recovery Stand (RS), as defined in the Service's "Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision" (Service 2003). Habitat conditions are annually observed and recorded within every RCW cluster core area, during the spring activity updates. Cluster core areas are defined as a buffer zone of continuous forest, 61 m (200 feet) in width, generally established around the minimum convex polygon containing a group's active and inactive cavity trees.

Endangered species biologists observe midstory and stand structure conditions and identify and document for species, height, and density. Areas for midstory restoration (hardwood and pine regeneration) will be addressed specifically within endangered species sites based on annual data collection. These will be more "spot" treatments as determined necessary by the Habitat Restoration Program Manager rather than landscape treatments. Most areas within the Sandy Grove TAG have already been prioritized and treated. Any future midstory restoration will be identified and treated after planned pine thinning actions. Additional management priorities, dictated by cluster activity status, group fitness, neighborhood analysis, or TLWG training area prescriptions, will be identified to reduce midstory issues within core cluster areas. All habitat restoration activities will be completed before operations begin on the MPTR. Neighborhood groups are groups not directly impacted by the project, but which occur adjacent to, or within the population's mean dispersal distance of groups that are directly affected by the project.

2.5. Monitoring

Fort Bragg will develop a RCW monitoring plan to be implemented within the 1.25-mile group density measurement distance (Hooper and Lennartz 1995) as a radius from the zone of adverse impacts in the Action Area. Monitoring will include banding of adult, juvenile and hatchling RCWs and Fort Bragg will collect breeding season data including clutch and brood sizes, numbers of fledglings produced, and family group composition. Most clusters within 1.25-mile of the range clearing and tree loss will be monitored. All 12 of the clusters that will be adversely affected will be monitored: clusters 110, 111, 112, 113, 114, 115, 152, 194, 251, 271, 272, and 603. In addition to the 12 directly affected clusters, 21 clusters located outside of the range footprint, DFL, and ROCA, will be monitored: clusters 22, 53, 75, 109, 146, 149, 151, 167, 172,

195, 219, 252, 253, 254, 255, 256, 269, 273, 451, 452 and 1029. Thirteen of these (clusters 53, 109, 146, 149, 151, 167, 219, 255, 256, 269, 273, 452, and 1029) fall within the proposed “non-dudded” areas and will require coordination with Range Control for access. One other cluster, 22, lies within the established McPherson “non-dudded” area which is currently coordinated for monitoring purposes.

The monitoring that is part of the proposed action will be performed by Fort Bragg staff or contractors that possess the Endangered Species Recovery Permits needed to conduct these activities. Any incidental take that might occur as a result of monitoring will be very limited, and will be accounted for as mandatory requirements under the practitioner’s permits. Effects of these monitoring activities on RCW are considered inconsequential to the effects analysis and will not be assessed in Section 4 below.

2.6. Other Activities Caused by the Action

A BO evaluates all consequences to species or critical habitat caused by the proposed Federal action, including the consequences of other activities caused by the proposed action, that are reasonably certain to occur (see definition of “effects of the action” at 50 CFR §402.02). Additional regulations at 50 CFR §402.17(a) identify factors to consider when determining whether activities caused by the proposed action (but not part of the proposed action) are reasonably certain to occur. These factors include, but are not limited to:

- (1) past experiences with activities that have resulted from actions that are similar in scope, nature, and magnitude to the proposed action;
- (2) existing plans for the activity; and
- (3) any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

In its request for consultation, Fort Bragg did not describe, and the Service is not aware of, any additional activities caused by the Action that are not included in the previous description of the proposed Action. Therefore, this BO does not address further the topic of “other activities” caused by the Action.

2.7. Action Area

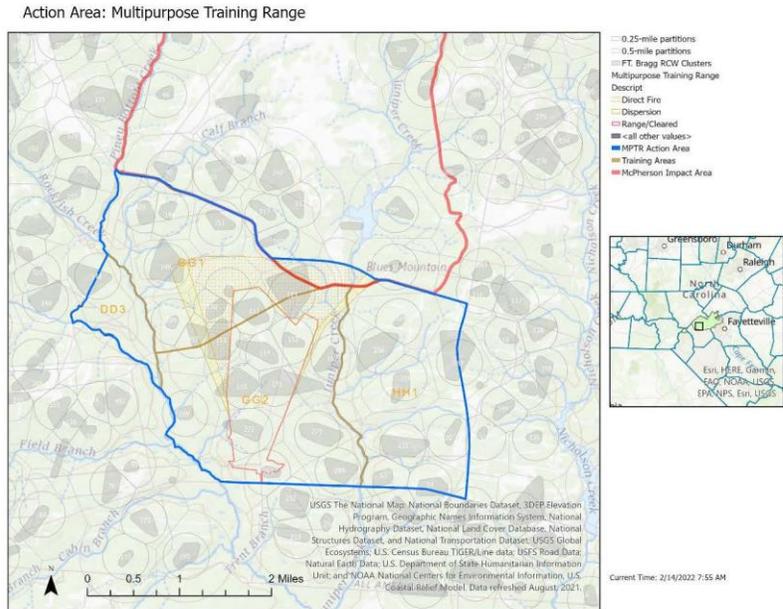
The action area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR §402.02). Delineating the action area is necessary for the Federal action agency to obtain a list of species and critical habitats that may occur in that area, which necessarily precedes any subsequent analyses of the effects of the action to particular species or critical habitats.

It is practical to treat the action area for a proposed Federal action as the spatial extent of its direct and indirect “modifications to the land, water, or air” (a key phrase from the definition of “action” at 50 CFR §402.02). Indirect modifications include those caused by other activities that would not occur but for the action under consultation. The action area determines any overlap with critical habitat and the physical and biological features therein that we defined as essential to the species’ conservation in the designation final rule. For species, the action area establishes

the bounds for an analysis of individuals' exposure to action-caused changes, but the subsequent consequences of such exposure to those individuals are not necessarily limited to the action area.

The action area includes the area selected for range construction, maintenance trails, and other sources of pine forest clearing. The action area also includes areas down range of the initial range clearing to include pine-forested acreage within the new surface danger zone (SDZ) established for the new range. Habitat management for red-cockaded woodpeckers, including hardwood control and removal of small diameter pines will be prioritized within the Sandy Grove TAG as a part of the proposed action. Therefore the action area will include all of training areas GG1, GG2, HH1 and DD3.

Figure 2-1 shows the locations of all activities that the proposed Action would cause and the spatial extent of reasonably certain changes to land, water, or air caused by these activities, based on the descriptions and analyses of these activities in sections 2.1–2.5. The Action Area for this BO includes the proposed expansion of the McPherson Impact Area west to Rockfish Creek, as well as all of Training Areas DD3, GG1, GG2 and HH1 east to Raeford Vass Road, and south to Plank Road.



3. SOURCES OF CUMULATIVE EFFECTS

A BO must predict the consequences to species caused by future non-Federal activities within the action area, *i.e.*, cumulative effects. “Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation” (50 CFR §402.02). Additional regulations at 50 CFR §402.17(a) identify factors to consider when determining whether activities are reasonably certain to occur. These factors include, but are not limited to: existing plans for the activity; and any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

In its request for consultation, Fort Bragg did not describe, and the Service is not aware of, any future non-Federal activities that are reasonably certain to occur within the Action Area. Therefore, we anticipate no cumulative effects that we must consider in formulating our opinion for the Action.

4. RED-COCKADED WOODPECKER

This section provides the Service’s biological opinion of the Action for the red-cockaded woodpecker.

4.1. Status of the Red-cockaded Woodpecker

This section summarizes best available data about the biology and condition of the red-cockaded woodpecker (*Picoides [=Dryobates] borealis*) throughout its range that are relevant to formulating an opinion about the Action. The Service published its decision to list the RCW as endangered on October 13, 1970 (35 FR 16047).

4.1.1. Species Description

The RCW is a small woodpecker, measuring about 7 inches in length, with a wingspan of about 15 inches, and weighing about 1.7 ounces (47 grams; Service 2020). Its back is barred with black and white horizontal stripes, and is distinguished from other woodpeckers by a black cap and nape that encircle large white cheek patches. Adult males possess a tiny red streak or tuft of feathers, the cockade, in the black cap near each ear and white cheek patch. The small cockade usually is covered by the black crown, except when protruded during excitement, and is not readily visible except upon close examination or capture. Adult males and females are not readily distinguishable in the field. Juvenile males have a red crown patch until the first molt, which can be distinguished from the black crown of juvenile females (Service 2020). The RCW occurs primarily in pine and pine-hardwood forests of the piedmont and coastal plain of 11 southern/southeastern states, including Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Texas, and Virginia (Barron et al. 2015).

4.1.2. Life History

The RCW is a territorial, non-migratory, cooperative breeding species (Lennartz et al. 1987; Walters et al. 1988), and the only North American woodpecker that exclusively excavates its cavities for roosting and nesting in living pines. Each group member has its own cavity, although there may be multiple cavities in a cavity tree. RCWs chip bark and maintain resin wells on the bole around the cavity where the fresh flow of sticky resin is a deterrent against predatory snakes (Rudolph et al. 1990) and indicates an active cavity tree. The aggregate of cavity trees, surrounded by a 200-foot, forested buffer, is called a cluster (Walters 1990). Cavities within a cluster may be complete or under construction (starts) and either active, inactive or abandoned. Clusters with one or more active cavity tree are considered as active RCW clusters.

The RCW lives in social units called groups. This cooperative unit consists of a single male or a monogamous breeding pair, offspring of the current year, and 0–4 adult helpers (Walters 1990). Helpers typically are male offspring from previous breeding seasons that assist the breeding pair by incubating eggs, feeding the young, excavating cavities, and defending the territory (Ligon 1970, Lennartz et al. 1987, Walters et al. 1988). Some large populations have instances, although very infrequent, of female helpers (Walters 1990; DeLotelle and Epting 1992; Bowman et al. 1998). Clusters only occupied by a single adult male are classified as a solitary male, while an adult male and female, with or without helpers, occupying a cluster are classified as a potential breeding group (PBG).

The RCW is territorial and each group defends its home range from adjacent groups (Hooper et al. 1982; Ligon 1970). The defended territory includes habitat used for cavity trees and foraging. RCWs feed mostly on a variety of arthropods, particularly ants and wood roaches, by foraging predominately on and under the bark of larger and older living pines (Hooper 1996; Hanula and Franzreb 1998). Males tend to forage in crowns and branches, while females commonly forage on the trunk. Dead and dying pines are important temporary sources of prey, and hardwoods are used occasionally. Group members forage together each day in parts of their territory.

RCWs have large home ranges relative to their body size. RCW tend to forage within 0.5 miles of their cluster. RCW groups forage within a home range that is highly variable, from as little as 84 acres (Butler 2001) to as much as 556 acres (Conner et al. 2001; Service 2003). Home range size is variable within and between populations, but tends to reflect foraging habitat quantity and quality, boundaries of adjacent RCW territories, and possibly cavity tree resource availability (Conner et al. 2001; Service 2003).

Because of the foraging behavior of RCWs, a 0.5-mile radius is used to establish survey areas to identify any unknown RCW clusters that may be affected prior to clearing or removing any potential RCW habitat. The 0.5-mile survey area provides a high probability that any unknown clusters that potentially use habitat within the area to be affected will be identified. This is based on RCW foraging ecology and behavior, the limitations of natural cavities to population growth in the North Carolina Sandhills, the ecology of RCW population growth via the formation of new clusters/groups, and relationship of habitat used for foraging within 0.5 mile of a cluster center.

A 0.5-mile radius circle around a cluster center encompassed an average of 91% of the actual home ranges of RCW groups in a North Carolina study (Convery and Walters 2004). Thus, unknown clusters in the North Carolina Sandhills identified by surveys within 0.5 mile of the edge of clearing or construction likely will have the vast majority of their foraging habitat somewhere within this 0.5-mile area.

The RCW is long-lived, with individuals frequently living up to 10 years or longer. For a bird of its size residing in temperate regions, the RCW exhibits exceptionally high survival rates. Survival rates of adult male helpers and breeders generally are about 5 percent higher than that of breeding females. There is distinct geographic variation in survival; survival rates are about 75 percent for males and 70 percent for females in the northern, inland population in the North Carolina Sandhills, about 80 percent and 75 percent, respectively, in coastal populations in North Carolina, and 86 percent and 80 percent, respectively, in central Florida. Such an association between increased survival and reduced fecundity is common in animal life histories. Annual variation in adult survival within populations is sufficiently small that it can largely be attributed to random chance rather than changes in environmental conditions (Walters et al. 1988). This level of variation can have large effects in small populations, however, and it appears that there are occasional poor years in which survival is substantially reduced. Also, some populations are vulnerable to periodic catastrophic mortality due to hurricanes. With survival rates as high as these, it comes as no surprise that some individuals live to old ages. A captive female lived to 17 years (J. Jackson, pers. comm.), and a male in the North Carolina Sandhills lived to 18 years of age in the wild (J. Carter III, pers. comm.).

Survival during the first year is more prone to underestimation than survival at subsequent ages, due to the greater possibility of dispersal out of the sampling area. Nevertheless, it is quite clear that survival rates are much lower during the first year than thereafter. Overall the mortality pattern is fairly typical of cooperatively breeding avian species. It is characterized by relatively low survival during the first year, especially of dispersers; relatively high survival of breeders and helpers; and senescence at the end of the life span. Compared to non-cooperative species, survival of both juveniles and adults is high, and the life span is long.

Pairs are highly monogamous and about 90 percent of PBGs nest each year during the April to July nesting season. Females usually lay three or four eggs in the cavity of the adult male. The short incubation period lasts approximately 10 days, and eggs hatch asynchronously. Normally, one brood is produced as a result of one or perhaps two nesting attempts involving only two parents. Most groups that attempt nesting fledge young, as nest failure rates are low for a species in the temperate zone, although fairly typical for a primary cavity nester (Martin and Li 1992, Martin 1995). Nestlings fledge after 24 to 29 days, although all nestlings rarely survive to fledglings. Partial brood loss of nestlings is common in RCW, although the number of hatchlings successfully fledged tends to increase with group size. Also, older and more experienced breeders have greater reproductive success (number of fledglings), which is maximized at about seven years of age, after which it declines sharply at nine or greater years of age (Reed and Walters 1996). About 20 percent of nests will fail completely, without producing a single fledgling. Groups with helpers experience whole brood loss less frequently than breeding groups without helpers. Renesting rates are geographically and annually variable. In good years, up to 30 percent of breeding groups will renest. Productivity of the second nesting is lower. Nest

predation, nest desertion, and loss of nest cavities to cavity kleptoparasites appear to be the primary causes of nest failure. Failure rate is higher during the egg stage than during the nestling stage, which suggests that nest desertion, rather than nest predation or loss of cavities to kleptoparasites, is the major cause of failure (Ricklefs 1969). The relative frequencies of these three causes of nest loss have never been measured directly, however. Nest predation rates may be lower than in other cavity nesters because of the protection provided by the resin barrier around the cavity, which clearly interferes with climbing by snakes (Rudolph et al. 1990).

Subadult/juvenile females from the current year breeding season normally disperse prior to the next breeding season, or are driven from the group's territory by the group (see Walters et al. 1988, for additional sociobiological/cooperative breeding information). Juvenile females remain at their natal territory to assume the breeding vacancy of the female only when the breeding male dies and the breeding female disperses or dies. Breeding females will disperse, creating a breeding vacancy, when her male offspring inherit the male breeding position (incest avoidance). Dispersing juvenile females move to nearby RCW territories in search of a breeding vacancy. These females either become breeders in a territory, or floaters among more than one territory where they are not associated with a single group.

Juvenile males remain in their natal territory or disperse. Those that remain become helpers or, if the breeding male dies before the next breeding season, breeders. Dispersing juvenile males search for positions as breeders in nearby territories where they become either breeders, helpers, or floaters. Most adult male helpers remain on their natal territory as helpers, where about 15 percent will inherit the territory as a breeding male in any given year. Some adult helpers disperse to other territories becoming breeders, solitary males, helpers, or floaters. However, breeding males are highly territorial and most will remain even without a breeding female. In contrast, about 10 percent of breeding females will break the pair-bond between breeding seasons and disperse to another territory as a breeder with a different male (Walters et al. 1988; Daniels and Walters 2000).

New groups on new territories arise by two processes, pioneering and budding (Hooper 1983). Pioneering is the occupation of vacant habitat by construction of a new cavity tree cluster, which is rare. Budding is the splitting of a territory, and the cavity tree cluster within it, into two. Budding is common in many other cooperative breeders, and is more common than pioneering in the RCW, since the new territory contains cavities from the outset. The available data indicate that budding indeed is more common than pioneering, and that pioneering is quite rare.

Given the preceding description of population dynamics, the key to conserving fully functioning RCW populations is identifying and protecting delineated populations. Larger populations are more resilient. The Species Status Assessment Report for the Red-cockaded Woodpecker, Version 1.3 (RCW SSA; Service 2020) defines a RCW demographic population "...as the aggregation of RCW clusters/territories where a breeding vacancy at any territory is likely to be replaced by a RCW from a territory within the delineated population." Because of this definition, dispersal is a critical factor in delineating demographic populations, particularly dispersal to fill breeding vacancies.

RCW dispersal distances and social, environmental, and genetic factors affecting dispersal have been evaluated most extensively by data from long-term studies of virtually completely banded populations in the North Carolina Sandhills and Marine Corps Base Camp Lejeune (e.g. Walters et al. 1988, Walters et al. 1992, Daniels and Walters 2000, Pasinelli and Walters 2002, Pasinelli et al. 2004, Kesler et al. 2010). Overall, median dispersal distances of juvenile males, helper males, juvenile females, and helper females, respectively, were 2.94 (1.83), 1.27 (0.79), 3.31 (2.06), and 1.88 (1.17) kilometers (miles) (Kesler et al. 2010). Dispersal events were movements by territorial non-breeders to a new territory where a breeding position was acquired the following breeding season.

The SSA establishes a juvenile female dispersal distance metric to delineate demographic populations. Helper males, when present, commonly acquire the breeding vacancy created by the death of the breeding male. Juvenile females do not replace the breeding female, their mother, on their natal territory. Juvenile females disperse except in rare instances when they remain as nonbreeding helpers. Thus, the continuity of potential breeding pairs at territories is most sensitive to effective dispersal of juvenile females, although the smaller class of floater females may also fill breeding vacancies. Female juvenile RCWs disperse following extraterritorial forays from their natal territory to explore and interact with other groups, with maximum foray distances from six to nine kilometers (Kesler et al. 2010). Juvenile females also are more reluctant to crossing open nonforest gaps (water, fields, etc.) during dispersal. Gaps greater than 150 meters are not absolute barriers during forays, but the probability of crossing diminishes substantially (Walters et al. 2011).

Because forays greater than six kilometers are rare for female juvenile RCWs, RCW demographic populations are delineated as the aggregation of RCW clusters/territories \leq six kilometers from other nearest neighbor active clusters/territories within the delineated population. This six-kilometer function corresponds with the perceptual distance, derived from the same data, at which juvenile females will compete for or acquire a breeding vacancy in the RCW Decision Support System (DSS)(Walters et al. 2011) spatially explicit individual-based population simulation model by Walters et al. (2011) and other derived RCW population models (e.g. Bruggeman and Jones 2014).

4.1.3. Numbers, Reproduction, and Distribution

The most current and useful review of the numbers, reproduction and distribution of the RCW throughout its range is contained in the Service's RCW Species Status Assessment Report for the Red-cockaded Woodpecker, Version 1.3 (RCW SSA; Service 2020). The RCW SSA was conducted within the Service's SSA framework for determining species viability in terms of resilience, redundancy, and representation (Service 2016). As stated in the Executive Summary of the RCW SSA, "[r]esilience is the ability of a population to withstand stochastic disturbance events. Redundancy is the ability of a species to tolerate stochastic and catastrophic events by virtue of multiple resilient populations. Representation is the capacity of a species to adaptively respond to environmental change." (Service 2020).

By 1973 or shortly afterwards, the best available rangewide estimates were about 10,000 individual RCWs in no more than 4,000 groups. The species continued to decline after listing as

indicated by repeated surveys of the number of active clusters, mostly on public lands. A decline of at least 23% since 1980 was estimated from repeated surveys of those sites by 1990.

Considerable progress was made toward improving the rangewide status of RCWs in the 1990's with new science, management, and understanding of population dynamics and limiting factors. Cavity limitations due to insufficient numbers of old pines for natural cavities could be alleviated with the advent and installation of artificial cavities in younger pines to sustain existing active clusters with breeding groups. Further, populations could be increased by inducing new group formation at recruitment clusters with artificial cavities in restored habitat suitable for foraging. These and other elements became an integrated recovery strategy by the late 1990's, incorporated in the Service's 2003 recovery plan, and implemented by various federal, state and other landowners that halted and began to reverse the historical decline.

Habitat in RCW clusters and foraging partitions has been successfully restored to an open condition in many populations over the past two decades. Although work remains to be done, maintenance of habitat is the primary management need in many populations. Maintenance of open habitat structure once restored is best achieved through regular prescribed fire fueled by native grasses and pine needle litter. The greatest management challenges in these cases are factors such as funding, sufficient personnel, urban encroachment and smoke management that constrain ability to burn restored areas at the frequency necessary to maintain desired conditions.

The positive state of current RCW distribution and abundance is primarily due to intensive management, including prescribed fire, artificial cavities, translocations, and other activities. RCWs now occupy a patchy distribution from extreme southern Virginia south to Florida and west to Texas and Oklahoma. In 1993, the RCW consisted of about 4,694 rangewide active clusters. Currently, the Service estimates there are at least 7,794 active RCW clusters rangewide across 11 states distributed as 124 demographic populations from as small as one active cluster to as large as 858 active clusters.

In the RCW SSA Report (Service 2020), resilience was categorized for 124 demographic populations across the range of the RCW based on population size, and a growth rate was used as a secondary factor to indicate relative resilience of populations within each of five resilience categories. A demographic population was defined as the spatial aggregation of active clusters/territories where a breeding vacancy is likely to be replaced by a RCW within the population. RCW dispersal data from long-term studies were used to spatially delimit demographics according to nearest neighbor active clusters within 3.7 miles. This represents the approximate 95th percentile of the distance juvenile females foray from their natal territory to search for a breeding vacancy in another territory.

Preparation of the RCW SSA required recent GIS data for the longest available past time-series mostly from federal and state agencies to delimit demographic populations. Demographic population size by year was based on either the number of active clusters by GIS or data from the Service's Annual RCW Property Report database when a database report corresponded to a single demographic population. Population resilience categories were: very low (<30 active clusters); low (30-99 active clusters); moderate (100-249 active clusters); high (250-499 active clusters); and very high (>500 clusters). These categories are based on previous RCW individual-

based spatially explicit modeling studies that identified population thresholds that affected vulnerability to stochastic demographic and environmental events.

Past time series abundance data were used to calculate growth rates for a current demographic population from as many years as possible from 1998 to 2017. Where at least five years of past abundance data were available, a constant growth rate was estimated, according to the initial and final population size, to produce the observed change in population size. Based on these rates, populations were categorized as decreasing ($\lambda < 1$), increasing ($\lambda > 1.02$) or stable ($\lambda = 1.00-1.02$).

Of the 124 populations analyzed in the RCW SSA (Table 4-1), current resilience of three populations were classified as very high (Apalachicola National Forest-St. Marks NWR-Tate's Hell State Forest, North Carolina Sandhills and Eglin Air Force Base), three as high (Francis Marion National Forest-Bonneau Ferry WMA- Santee Coastal Reserve WMA, Fort Stewart and Fort Benning), 10 as moderate, 37 as low, and 71 as very low. Thirteen populations had decreasing growth rates, 66 were increasing, 19 were stable, and the rates for 26 could not be assessed because of inadequate data. The 13 populations with decreasing growth rates are restricted to low and very low resilience classes. Stable and increasing growth rates of 73 populations in inherently low and very low resilience categories showed positive effects of management.

In the RCW SSA, representation was assessed based on life history variation and ecological and geographic diversity among 13 ecoregions, 11 of which represented recovery units in the 2003 Recovery Plan (Service 2003). Redundancy was reported in terms of the number of populations by resilience classes and representation as a matrix of the number, redundancy, and distribution of populations by resilience class among ecoregions. Representation has decreased significantly in relation to historical distribution and abundance of the species. However, representation in terms of species presence and absence in ecoregions has not decreased further since the 2003 recovery plan was developed and subsequently implemented.

Of 124 current demographically delineated populations, redundancy of very high (3) and high (3) resilience populations is low. Redundancy of very highly to moderately resilient populations also is low within and among ecoregions. The total number of populations gives the appearance of greater redundancy, but this redundancy is comprised of populations of low or very low resilience. Of the 13 ecoregions with current populations, those with high (3) or very high (3) resilient populations are restricted to only four regions: Mid-Atlantic Coastal Plain, East Gulf Coastal Plain, South Atlantic Coastal Plain, and Sandhills. Only two ecoregions, the East Gulf Coastal Plain and the Sandhills, have more than one population classified as of high or very high resilience, and only these two regions have more than two populations classified as moderately to very high resilience. Only four ecoregions (South Atlantic Coastal Plain, Mid-Atlantic Coastal Plain, West Gulf Coastal Plain, Upper East Gulf Coastal Plain) have two populations of moderate to high resilience, and thus some level of redundancy in terms of relatively resilient populations. All of the populations in six ecoregions (Cumberland Ridge and Valley, Florida Peninsula, Gulf Coast Prairie Marshes, Mississippi River Alluvial Plain, Ouachita Mountains, and Piedmont) are of low or very low resilience, but are important for representation in their respective regions and across the range.

RCW populations and habitat are periodically subjected to disturbances including those from ice storms, tornados, and hurricanes that increase mortality, destroy cavity trees and foraging habitat, and cause population declines. Of the 124 populations reviewed in the RCW SSA, most (87) reside in coastal plain ecoregions including four of six populations with very high and high resilience. Populations in the West Gulf Coastal Plain (17), East Gulf Coastal Plain (14), Florida Peninsula (22), South Atlantic Coastal Plain (10), and Mid-Atlantic Coastal Plain (24) are particularly vulnerable to periodic hurricanes. Since 1998, every population in the coastal plain ecoregions has been affected by one or more hurricanes, although without extirpation. Post-storm management has been critical to mitigate impacts by the installation of artificial cavities, reducing hazardous fire fuels from woody debris, and restoring suitable forest composition and structure.

Current RCW populations are highly dependent on active conservation management. Favorable practices include application of prescribed fire, beneficial and compatible silvicultural methods to regulate forest composition and structure, provisioning of artificial cavities where natural cavities are insufficient, translocation to sustain and increase small vulnerable populations, and effective monitoring to identify limiting biological and habitat factors for management. Apart from a future condition when forests consist of pines of suitable age, number and abundance for natural cavities, there is no future point or condition when RCW populations will not be dependent on continued active management due to the need to regularly apply prescribed fire. The vast majority of all current populations continue to depend upon artificial cavities. All of these future active management measures require substantial organizational resources with staff and funding at populations managed for conservation and recovery. Fiscal year budgets for federal, state, and other public agencies are not expected to increase in future years. Further, there is increasing uncertainty among some agencies on their ability to sustain future RCW conservation and management with other agency missions and objectives for their lands.

Also, climate change has the potential to influence productivity and the distribution of vegetative communities, such as longleaf pine systems, through anticipated changes in temperature and precipitation patterns. RCW females that lay eggs earlier in warmer climates and in response to increasing temperature from climate change are more productive, but inbred and inexperienced females lay later and are less productive (Schiegg et al. 2002). This underlies the importance of having RCW populations represented throughout the latitudinal and longitudinal extent of the species range.

Demographic separation of populations was based on a juvenile female dispersal distance metric in the RCW SSA. Characterizing RCW dispersal behavior provides useful insight into the potential effects of habitat fragmentation. Helper males, when present, commonly acquire the breeding vacancy created by the death of the breeding male. Juvenile females do not replace the breeding female, their mother, on their natal territory to avoid incest. Juvenile females disperse except in rare instances when they remain as nonbreeding helper. Thus, the continuity of potential breeding pairs at territories is most sensitive to effective dispersal of juvenile females, although the smaller class of floater females may also fill breeding vacancies. Female juvenile RCWs disperse following extraterritorial forays from their natal territory to explore and interact with other groups, with maximum foray distances from six to nine kilometers (3.7 to 5.6 miles)(Kesler et al. 2010)

Juvenile females also are more sensitive to crossing open non-forested gaps (water, fields, etc.) during dispersal. Gaps greater than 150 meters are not absolute barriers during forays, but the probability of crossing gaps greater than 150 meters (492 feet) diminishes substantially with increasing gap size with rare movement across gaps greater than 600 meters (1,969 feet) (Kesler et al. 2010, Walters et al. 2011, Bruggeman and Jones 2014). Forays and dispersal of juvenile females from their natal territory through a complex habitat matrix also is affected by forest habitat conditions. In general, RCWs tend to prefer and more readily move through habitat similar in structure and composition to that used for foraging, while avoiding areas with dense midstory cover (Moody et al. 2011, Trainor et al. 2013).

The relationships of group density and fitness and habitat quality are complex. In Louisiana, density of groups, group fitness, and the number of old growth trees (90 to 120 years in age) were all strongly positively related (Conner et al. 1999). Population densities in many locations are much higher now than before science-guided management was applied range-wide in the early 1990's. Budding and pioneering have produced much higher local RCW group densities, invariably in areas of exceptionally high quality habitat and with suitable pines for natural cavity excavation.

In one study of effects of RCW group density on home range size, average home ranges (95% kernel) and core defended areas (50% kernel isopleths) were larger at low densities (0.39 – 0.42 RCW groups/50 hectares [123.5 acres]) than medium (0.57 – 0.60 groups/50 ha) and high (0.85 groups/50 ha) densities. Also, neighboring RCW group interactions and the overlap for home range and core areas was greater at high densities (Garabedian et al. 2018). This study also concluded that with the establishment of minimally suitable baseline foraging habitat conditions, RCW group density and home range dynamics was determined more by the distribution of cavity trees.

Previous analyses of project impacts used the number of groups occurring within 1.25 miles of the project area or directly affected RCW group (Conner and Rudolph 1991; Hooper and Lennartz 1995; Crowder et al. 1998) as an index of group fitness and to gauge the project's impact to the affected RCW population. Clusters with ≤ 2.5 active clusters within 1.25 miles were considered "sparse," and therefore more vulnerable to abandonment because of lack of emigration/immigration (Conner and Rudolph 1991). Clusters with 2.6 to 4.6 active clusters within 1.25 miles were considered to be of moderate density. Clusters having 4.7 active clusters within 1.25 miles are considered healthy and "dense" (U.S. Army Corps of Engineers 2009). The BA states that all clusters analyzed within 1.25 miles of the habitat loss associated with the Action will retain densities ≥ 9.0 active groups post-project.

4.1.4. Conservation Needs and Threats

In spite of the relatively small size of most populations, RCW conservation needs have been remarkably consistent through time and when applied, the status of RCWs has been steadily improving since the early 1990s. This steady increase can be attributed to various factors,

including aggressive prescribed burning programs, artificial cavity provisioning and regional translocation cooperatives and strategies (Costa and DeLotelle 2006).

Primary threats to species viability for RCWs all have the same basic cause: lack of suitable habitat in fire-maintained ecosystems. On public and private lands, the quantity and quality of RCW habitat are greatly affected by past and current fire suppression and detrimental silvicultural practices (Ligon et al. 1986, 1991, Baker 1995, Cely and Ferral 1995, Masters et al. 1995, Conner et al. 2001).

Serious threats stemming from this lack of suitable habitat include: (1) insufficient numbers of cavities and continuing net loss of cavity trees (Costa and Escano 1989, James 1995, Hardesty et al. 1995), (2) habitat fragmentation and its effects on genetic variation, dispersal and demography (Conner and Rudolph 1991), (3) lack of good quality foraging habitat (Walters et al. 2000, James et al. 2001), and (4) fundamental risks of extinction inherent to critically small populations from random demographic, environmental, genetic, and catastrophic events (Shaffer 1981, 1987).

Red-cockaded woodpecker population size is significantly limited by the availability of cavity trees and suitable, stable clusters. The natural growing season fire regime has been lost due to fire suppression and landscape alterations that have altered the availability of lightning-flammable fine plant litter fuels. In the absence of prescribed fire, fire intolerant hardwoods survive and grow to midstory or higher levels in the forest canopy. Red-cockaded woodpeckers are sensitive to midstory hardwood encroachment, and will abandon their cavities and clusters due to hardwood encroachment (Conner and O'Halloran 1987; Costa and Escano 1989).

Habitat fragmentation can affect dispersal of individuals in adjacent and nearby groups, and the likelihood that breeding vacancies can be filled. Demographic viability of groups, neighborhoods, and populations is primarily dependent on the ability of group members to disperse (Service 2005). For assessing a project's impacts to foraging habitat, the Service defined neighborhood groups as those groups not directly impacted by the project but which occur adjacent to, or within the dispersal distance of, groups that are directly affected by the project (Service 2005).

4.2. Environmental Baseline for the Red-cockaded Woodpecker

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the RCW, its habitat, and ecosystem within the Action Area. The environmental baseline is a "snapshot" of the species' health in the Action Area at the time of the consultation, and does not include the effects of the Action under review.

4.2.1. Action Area Numbers, Reproduction, and Distribution

Thirty-one RCW clusters and 44 0.5-mile radius foraging partitions are within or overlap the Action Area. Table 1 of the March 9, 2022 addendum to the BA lists eighteen 0.5-mile radius foraging partitions that overlap with clearing limits of the range and/ or direct fire that would be part of range operations. Eleven of these will be substantially affected.

The BA identifies 130 RCW potential breeding groups (PBGs) having cavity tree clusters and/or foraging habitat within 3.7 miles of the range clearing and live fire training associated with the Action. The 3.7 mile distance represents approximately the 95th percentile of the distance juvenile females foray from their natal territory to search for a breeding vacancy in another territory (Service 2020). Juvenile female RCWs disperse except for rare instances when they remain as a nonbreeding helper. Eighteen active clusters will be directly affected by habitat loss. Sixteen of these are occupied by potential breeding groups. The 0.5-mile foraging partitions for five encompass less than 120 acres of potential good quality foraging habitat.

RCW conservation on Fort Bragg is guided by the Endangered Species Management Component (ESMC), Appendix B. 2 of the INRMP. The ESMC guides the installation to exercise ecosystem management on training lands:

“Ecosystem management is an integrated, science-based approach to the management of natural resources which attempts to create and maintain the health and diversity of ecosystems while allowing for sustainable use by humans of the goods and services they provide.”

The ESMC cites a reasonable and prudent alternative expressed in a 1990 Service jeopardy Biological Opinion that promoted Fort Bragg’s move toward ecosystem management:

“Endangered species habitat conservation must be the highest natural resource management priority for Fort Bragg. Timber, pine straw, and game harvest management objectives must be secondary to endangered species management objectives. The Army’s forest management goal should be to restore and perpetuate a longleaf pine / wiregrass ecosystem maintained by fire.”

Implementation of this alternative made ecosystem management a priority for the Fort Bragg Natural Resources Management Program. In 1996, the Department of Defense (DoD) mandated the use of ecosystem management as the primary basis for natural resource management on all military installations (DoD Instruction 4715.3; Environmental Conservation Program). The current INRMP and ESMC are written to accommodate this overarching guidance. Fort Bragg’s adoption of ecosystem management, as outlined in the INRMP, ESMC and other supporting plans has greatly improved environmental conditions for species adapted to longleaf pine/wiregrass ecosystems, including the RCW.

While Fort Bragg utilizes an ecosystem management approach for natural resources management, the ESMC incorporates species-specific and site-specific actions that are required for species recovery and compliance with Biological Opinions, Recovery Plans, INRMP objectives, Army policy and DoD instructions. To more efficiently reach RCW conservation objectives, the Forest Management Plan (Appendix B.5.e. of the INRMP) generally prioritizes stand improvements for stands within foraging partitions that contain less than 120 acres of good quality foraging habitat. These practices include retention of most of the large pines, reduction of over-stocked small pines and small hardwoods, which improves the condition of residual forest in terms of RCW foraging and nesting habitat.

A comprehensive overview of Fort Bragg's RCW conservation program can be found in the ESMC, pp 31 – 58. One of the goals outlined in the ESMC is to expand the installation's RCW populations to reach habitat carrying capacity. To facilitate this, the Training Lands Working Group will ensure that training area prescriptions adhere to ecosystem management guidance contained in the INRMP. Fort Bragg may provision recruitment clusters where unoccupied habitat is made suitable.

The ESMC cites the [Department of the Army 2007. Management Guidelines for the Red-cockaded Woodpecker on Army Installations. 27pp.] to:

“...direct installations to follow foraging habitat and silviculture management guidelines presented in the 2003 RCW Recovery Plan (Sections 8.I and 8.J). In accordance with these guidelines, silvicultural practices will utilize ecosystem management to produce good quality habitat throughout RCW management areas. Nesting and foraging habitat will be managed to meet all of the Recovery Standard criteria for good quality habitat... Forest management will emphasize the production and retention of old-growth pines; pine and hardwood midstory reduction; retention of all dead and dying trees (snags); and restoration and maintenance of the herbaceous stratum through the implementation of growing season prescribed fire on a one to three-year rotation, canopy (shade) reduction, and minimization of soil disturbance (use of fire plows will be allowed only in emergency situations). All habitat management activities within RCW clusters, with the exception of prescribed fire, will be conducted outside of the nesting season.”

Previous analyses of major project impacts used the number of groups occurring within 1.25 miles of the project area or directly affected RCW group(s) (Conner and Rudolph, 1991; Hooper and Lennartz, 1995; Crowder et al., 1998) as an index of group fitness and to gauge the project's impact to the affected RCW population (USACE 2008). The BA included a group density analysis using a 1.25-mile radius buffer around the cluster center for every active cluster within 0.5 mile of the Action clearing limits, adjacent to clusters anticipated to be lost due to effects of the Action, or otherwise affected by the Action (e.g., minor foraging habitat loss). For each cluster analyzed, the number of active clusters within 1.25 miles of the cluster center was calculated. All clusters with a core cluster area (minimum convex polygon connecting all outer cavity trees and a 200-foot buffer of the convex polygon) within 1.25 miles of the affected cluster's center were included in the cluster density totals. The calculated totals did not include the subject cluster if it was expected to be lost as a result of the Action. However, clusters anticipated to be taken were included in the pre-project density totals of their neighboring clusters.

The centers of 11 active clusters (clusters 22, 109, 149, 151 167, 252, 269, 273, 452, 517 and 560), fall within a 0.5-mile radius of the Action Area clearing limits. These clusters are mostly peripheral to proposed tree loss associated with the Action. Of these, minor amounts of available foraging habitat will be removed from 0.5- mile radius partitions for clusters 22, 149, 151, 167, 452, and 560. Cluster 149 will lose two out of 16 cavity trees. A total of 46 active clusters fall within 1.25 miles of these clusters with 39 maintaining over 120 acres of potential good quality foraging habitat (PGQFH). The 11 active clusters had pre-project densities between 13 and 20 groups (average density = 11.27 groups) within 1.25 miles of the affected cluster's center. All

clusters analyzed within 1.25 miles had densities ≥ 9.0 active groups post-project. (Fort Bragg 2021).

4.2.2. Action Area Conservation Needs and Threats

The RCW clusters, PBGs and supporting foraging habitat within the Action Area are a key part of the matrix of RCW territories comprising the Sandhills East Primary Core Recovery Population. Sandhills East consists of the Calloway Tract (owned by The Nature Conservancy), Carver's Creek Tract, Fort Bragg, McCain Tract, and Weymouth Woods Sandhills Nature Preserve. Range construction and operation will substantially and directly affect 11 RCW clusters. Clearing limits of the range and/ or direct fire will affect seven additional 0.5-mile radius foraging partitions. The Action Area contains 31 clusters and all or part of the 0.5-mile-radius foraging partitions for 44 active clusters.

Fort Bragg's population comprises most of the Sandhills East Primary Core Population, which is one of two primary core populations in the Sandhills Recovery Unit; Fort Benning comprises the other primary core. Fort Bragg contains over 83% of the Sandhills East Primary Core Recovery Population and over 63% of the combined Sandhills East Primary Core and Sandhills West Essential Support Populations. In 1998, the installation contained 298 active clusters and an estimated 231 Potential Breeding Groups (PBGs)(Fort Bragg 2021). The RCW population has continued to expand with the implementation of aggressive habitat management, which has included growing season prescribed burns, hardwood midstory control, thinning of dense stands of young pines, and a proactive artificial cavity provisioning program. In 2005, with the addition of PBGs on North Carolina Sandhills Conservation Partnership (NCSCP) lands, Fort Bragg became the first military installation and primary core recovery population to reach its population goal (350 PBGs) under the 2003 RCW Recovery Plan. Monitoring during the 2020 breeding season documented 521 active clusters and an estimated 461 PBGs on Fort Bragg. The NCSCP, a program that has increased the number of clusters counted towards recovery goals by protecting additional groups on adjacent lands in perpetuity, added 33 PBGs.

The 2007 Army RCW Guidelines require the establishment of clear installation population goals in accordance with the recovery unit population goals established in the 2003 RCW Recovery Plan (Department of the Army 2007). The guidelines also instruct installations that have achieved population goals to continue proactive management and the establishment of recruitment clusters to achieve habitat carrying capacity consistent with mission requirements. Fort Bragg's initial recovery goal was set at 436 active clusters in 2003 (Service 2003). Fort Bragg has established installation-level goals to manage for habitat carrying capacity. Installation goals consider all RCW clusters, including inactive clusters and those occupied by a solitary male or female.

The installation population goal is not a static goal and may increase or decrease in response to RCW budding or pioneering and changes in the habitat carrying capacity. In the Fall of 2007, 447 actively managed RCW clusters were identified on Fort Bragg. Some of these were artificially provisioned recruitment clusters, while others were a result of budding or pioneering. In addition to the actively managed clusters, the 1997 Endangered Species Management Plan (ESMP) installation goal included 42 planned recruitment clusters that had yet to be established.

These additional planned recruitment clusters included 39 recruitment clusters on the NTA and three recruitment clusters on the Overhills tract. These planned recruitment clusters increased the Fort Bragg population goal to 489 managed clusters. Fort Bragg contains areas of unoccupied suitable habitat that could support additional RCW groups. Additional RCW groups could enhance Fort Bragg's ability to maintain the population at recovery levels by providing critical demographic connectivity. Fort Bragg contains 105,629 acres of potentially suitable habitat. Prior to 2011, biologists evaluated 45 sites on Fort Bragg for recruitment potential using 200 acres of potentially suitable habitat as the minimum requirement for suitability. This evaluation identified 19 of 45 sites as suitable for recruitment, and these additional recruitment sites brought Fort Bragg's total cluster-level population goal to 517 clusters. A more recent review (November 2016) of the population goal taking newly budded and pioneered clusters into account over the past five years has brought the population goal to a total of 547 managed clusters.

The combination of Army development in the Main Cantonment Area (MCA) and private development to the north in Harnett County is gradually isolating RCW groups in Fort Bragg's Northeast Area (NEA) from the remainder of the Fort Bragg population. Consequently, the NEA is an area of concern for the RCW in terms of genetic and demographic isolation. RCW groups in the NEA are currently connected to the remainder of the Fort Bragg population by a narrow corridor of fragmented habitat known as the Greenbelt, which runs along the southern and western boundaries of the MCA. The Greenbelt functions as a forested corridor connecting approximately 40 RCW groups on the NEA with the remaining Fort Bragg population. Approximately 80 percent of the Greenbelt is composed of contiguous forested lands, while the remaining 20 percent is fragmented by roads, a golf course, power line rights-of-way, housing areas, and numerous other installation facilities. In 1992, the Service issued a Biological Opinion for a Greenbelt construction project that mandated the formulation of a plan for prioritizing habitat restoration and establishing occupied RCW clusters within this corridor (Service 1992). Subsequent efforts to improve this demographic link included years of habitat improvements and translocations aimed at stabilizing and increasing the number of active clusters within the Greenbelt.

The dispersal distance metric for juvenile female red-cockaded woodpeckers (3.7 miles) was useful in determining the primary neighborhood for examining effects of habitat loss that are part of the proposed Action. Gap avoidance by dispersing juvenile females also is important behavior to consider for describing effects of habitat fragmentation. Gaps greater than 150 meters (492 feet) are not absolute barriers during forays, but the probability of crossing gaps greater than 150 meters diminishes substantially with increasing gap size with rare movement across gaps greater than 600 meters (1,969 feet) (Kesler et al. 2010, Walters et al. 2011, Bruggeman and Jones 2014).

This 600-meter measurement was part of the process of delineating demographic populations in the RCW SSA Report. A sufficient distribution of 600-meter-plus gaps, that would cause a dispersing bird to take a highly circuitous route in the 3.7-mile distance between active clusters, indicate that cluster aggregations are in different demographic populations.

There are several large open areas on Fort Bragg distributed through the managed RCW habitat matrix that could influence or impede dispersal of juvenile female RCWs. The five largest drop

zones: Sicily, Holland, Normandy, St. Mere Eglise, Salerno, and Nijmegen, all are at least 600 meters across. The largest, Sicily Drop Zone, is over 1,000 meters wide and nearly 5,600 meters long.

The largest non-forested acreages are in the Impact Areas. The McPherson Impact Area north of the Action Area is among the largest breaks in RCW habitat matrix. Two other are within the Coleman Impact Area to the east. One open section of the Coleman Impact Area is over 1,900 acres in size. Gaps in these areas may span more than 1,500 meters across.

Even with the substantial overall size of the Sandhills East Primary Core Recovery Population, significant portions are still vulnerable to the effects of habitat fragmentation. Increasing development pressure on the Greenbelt, and the Army's acquisition of the Overhills tract, led the North Carolina Sandhills Conservation Partnership (NCSCP) RCW Strategy Working Group to propose a northern connector. The northern connector would link RCW groups in the NEA with those occurring on the Overhills tract. Research indicates that the majority of dispersals from the NEA involve birds that have initially dispersed to the Overhills tract through the northern connector (Walters et al. 2004). Consequently, the northern connector is currently recognized as a critical link for maintaining demographic connectivity between the NEA and the remainder of Fort Bragg (Walters 2005a). The Greenbelt continues to be a priority management area and efforts are also focused on the protection of forested lands between the NEA and the Overhills tract.

The three largest impact areas (McPherson, Coleman, and MacRidge) are located in the central portion of Fort Bragg. Fort Bragg's impact areas and firing ranges contain approximately 85 active RCW clusters (Fort Bragg, Unpublished 2015 Activity Status Data). The interior portions of the two largest impact areas (McPherson and Coleman) are mostly devoid of mature trees; however, the periphery of these impact areas contain quality habitat that is critically important for maintaining demographic connectivity of the overall population. The McPherson and Coleman impact areas contain a total of 48 active clusters. The remaining two impact areas on Fort Bragg (MacRidge and Manchester) contain a total of 37 active clusters in both peripheral and interior areas. Although some clusters within the interior portions of impact areas were historically color-banded, none are currently banded or intensively monitored.

Significant portions of the impact areas and ranges are managed for the RCW. Habitat management activities include prescribed fire, herbicide treatments, and pine thinning. Prescribed fires are especially important for ecosystem management and as a means of reducing the potential for wildfires in these areas. Fort Bragg's prescribed fire program attempts to mimic natural wildland fire cycles by scheduling managed woodlands for implementation during the growing season on a one to three-year rotation. Approximately one-third of the installation is scheduled for prescribed burning each year. Site-specific fire prescriptions are prepared based on restoration status and habitat management objectives. Prescriptions include provisions to avoid adverse effects on overstory pines, endangered species habitats, and other significant habitat features. Habitat restoration and management within these areas are equally beneficial to the training mission.

4.3. Effects of the Action on the Red-cockaded Woodpecker

In a BO for a listed species, the effects of the proposed action are all reasonably certain consequences to the species caused by the action, including the consequences of other activities caused by the action. Activities caused by the action would not occur but for the action. Consequences to species may occur later in time and may occur outside the action area.

We identified and described the activities included in the proposed Action in sections 2.1–2.4. We identified and described other activities caused by the proposed Action in section 2.5. Our analyses of the consequences caused by each of these activities follows.

4.3.1. Range Construction

Foraging Habitat

Approximately 400.47 acres of pine forested, occupied foraging habitat within the 0.5-mile radius foraging partitions for four red-cockaded woodpecker breeding groups will be cut to create the range (Table 4-1). All 82.86 acres of Cluster 114's 0.5-mile radius foraging partition will be cleared to facilitate range construction. Forest clearing will reduce Cluster 271's 0.5-mile foraging partition by 72.1%, from 143.62 acres to 40.06 acres. Cluster 272's partition will be reduced by 71.2%, from 233.11 acres to 67.17 acres.

Additionally, 338.9 acres of pine forested, occupied foraging habitat within the 0.5-mile radius foraging partitions for three red-cockaded woodpecker breeding groups will be eliminated/destroyed mostly by range construction with additional loss caused by future live-fire training (Table 4-2). All 108.22 acres of Cluster 111's 0.5-mile radius foraging partition will be removed to construct the range or destroyed as a result of target engagement for direct fire. 112.24 (92.7%) of Cluster 115's 153.81-acre partition will be cut or destroyed. Out of 121 PGQFH acres supporting Cluster 152, 112.24 acres (92.7%) will be cut or destroyed, leaving 8.78 acres.

The managed stability standard (pp. 292-294, Appendix 5 in the Recovery Plan; SMS) defines the minimum foraging habitat requirements considered necessary to avoid foraging habitat-related incidental take. The SMS identifies the quantity and quality of foraging habitat necessary for a RCW group to survive and reproduce based in foraging habitat alone (Service 2005). The top two conditions needed to satisfy the SMS are: (1) Provide each RCW group a minimum of 689 square meters (m^2)(3,000 square feet [ft^2]) of pine basal area, including only pines ≥ 25.4 centimeters (10 inches) DBH; and (2) provide the above pine basal area on a minimum of 30.4 hectares (75 acres).

Cavity Trees

Construction and site preparation will require the removal of at least 91 cavity trees within eight active clusters (Table 4-3). No trees will remain in clusters 111, 114, 152, 271 or 272. Thirteen of 17 cavity trees in Cluster 115 will be cut; 11 of Cluster 251's 11 cavity trees will be removed. Out of 13 cavity trees comprising Cluster 194, one cavity tree will be cut.

Cavity removal will eliminate roosting sites for all members of six PBGs (Clusters 111, 114, 152, 251, 271, and 272). Destruction of 13/17 cavity trees in Cluster 115 may result in cluster abandonment by one breeding group. The loss of one out of 13 cavity trees for comprising Cluster 194 may result in the loss of a group member of one breeding group.

The BA does not specify the group sizes – the number of individual RCWs that make up each of the breeding groups losing cavities. Fort Bragg’s 2019 Red-cockaded Woodpecker (*Dryobates borealis*) Report for Banding/Cavity Provisioning Permit Requirements (Fort Bragg 2019) identified an average group size of between 3.07 (2018) to 2.76 (2019) adults per breeding group on Fort Bragg. With total and near total loss of seven clusters we can expect between 19 (where average group size is 2.76 birds) and 22 (where average group size is 3.07 birds) RCWs including breeding birds and associated helpers will be exposed to the elements and potentially lost from the population. These calculations do not account for floater (adults not affiliated with a breeding group) or first-year RCWs that may be difficult to detect.

Independent of loss of foraging habitat, seven PBGs will be lost from within the management unit due to loss of available cavities. The 19 to 22 displaced individual RCWs are likely to venture into neighboring clusters seeking suitable roosting cavities. Dispersing RCWs from the eliminated clusters will fight with members of neighboring groups and attempt to usurp those RCWs from their roosting cavities. Resident RCWs in these clusters will either succeed or fail to defend their cavities from RCWs expelled by the Action. Some of these will be displaced and forced to seek available cavities elsewhere outside of the range construction area.

Removal and destruction of 739.37 acres of PGQFH within the 0.5-mile radius foraging partitions of seven RCW PBGs will result in loss of six of those PBGs. These losses will be due to reducing PGQFH acreage below the minimum acreage (75 acres) and the proportion of currently available habitat lost from these six partitions which will range from about 71% to 100%. PBGs lost due to habitat removal and destruction include those residing in clusters 111, 114, 115, 152, 271 and 272. Sufficient foraging habitat for Cluster 251 (about 169.49 acres) would remain post-project to support one PBG.

Clusters 111, 114, 115, 152, 271 and 272, and their associated RCW PBGs will be lost from the Sandhills East Primary Core Recovery Population due to a combination of foraging, nesting and roosting habitat removal. Displaced RCWs from these clusters will initially disperse into the foraging partitions immediately adjacent to the range clearing, disrupting essential life history functions of at least 13 clusters outside of this phase of the Action.

Habitat fragmentation can affect dispersal of individuals in adjacent and nearby groups, and the likelihood that breeding vacancies can be filled. Demographic viability of groups, neighborhoods, and populations is primarily dependent on the ability of group members to disperse (Service 2005). For assessing a project’s impacts to foraging habitat, the Service defined neighborhood groups as those groups not directly impacted by the project but which occur adjacent to, or within the dispersal distance of, groups that are directly affected by the project (Service 2005).

The BA referenced long-term studies of RCW populations in the North Carolina Sandhills and Marine Corp Base, Camp Lejeune (e.g. Walters et al. 1988; Walters et al. 1992; Daniels and Walters 2000; Pasinelli and Walters 2002; Pasinelli et al. 2004; and Kesler et al. 2010) to characterize RCW dispersal behavior and determined that the neighborhood of the Action Area encompasses 3.7 miles (six kilometers) of the groups that would receive adverse impacts of the proposed action. 130 active clusters and/or their 0.5-mile radius foraging partitions fall within the 3.7-mile neighborhood (Fort Bragg 2021).

Of the 130 RCW groups comprising the Action neighborhood, 116 are within the installation boundary. Fourteen are located on private lands. One-hundred thirteen of the 116 Fort Bragg groups are known to be either active or occupied by a PBG. Ninety-eight RCW groups have 120 or more acres of PGQFH. Seventeen groups have less than 120 acres but more than 75 acres and one group (Cluster 268) is supported by less than 75 acres of PGQFH.

Family group composition of neighborhood PBGs will be disrupted and more RCWs will be reliant on the diminished amount of foraging habitat available to all groups adjacent to range clearing. Demographic effects may not be limited to the neighborhood, but may extend throughout the Sandhills East Primary Core Recovery Population. These effects will include usurpation of individual RCWs from their roosting cavities and changes in pair members where one or both members of a breeding pair are replaced by displaced RCWs.

Some adult male RCWs, especially breeding males directly affected by cavity loss are likely to remain in residual habitat close to where their roosting cavities were. A few female RCWs may remain in neighboring clusters and residual habitat. Many will disperse and may displace current breeding females in other PBGs. A small number of RCWs representing all demographic categories (e.g., breeding males, breeding females, helpers, female floaters, etc.) will spend weeks or months seeking available positions in existing PBGs or vacant habitat. A significant number of individual RCWs, either directly affected by habitat loss or usurped from their cavities by displaced RCWs will be taken by predators, succumb to the elements, killed by another RCW or other cavity-dependent species or lost from the population by other means.

4.3.2. Range Operation

Foraging Habitat

Once the range becomes operational, 558.19 acres of pine forested, occupied foraging habitat within the 0.5-mile radius foraging partitions for six red-cockaded woodpecker breeding groups will be eliminated/ destroyed primarily by the effects of live fire training (Table 4-5). Of 68.13 acres of PGQFH available to Cluster 110, 53.93 acres will be destroyed by live fire (79.2% loss) leaving 14.2 acres for this RCW group. Cluster 112's entire 45.92-acre foraging partition will also be eliminated. All but 2.21 acres (1.1%) of Cluster 113's 207.21-acre foraging partition will be lost to impacts from live fire. Only 1.07 acres will remain available to Cluster 194, representing a loss of 99.3% from the pre-project amount (157.88 acres). Cluster 603's 105.72-acre partition will be depleted by 59.8%, leaving 42.5 acres.

Foraging partitions for five clusters will be directly affected by live fire without impacts from range construction (Table 4-6). These impacts will result from weapons use within the direct firing line (DFL) portion of the Action Area. About 53.01 PGQFH acres are involved.

Of 225.56 acres of PGQFH available to Cluster 149, 16.57 acres will be destroyed by live fire (7.3% loss) leaving 208.99 acres for this RCW group. Cluster 151's partition will be slightly reduced from 197.91 acres to 196.61 acres, a 0.7% decline. Only 1.1 acres are expected to be lost to Cluster 167, a 0.5% loss from 209.69 to 208.59 acres. Cluster 452's partition will be reduced by 0.73 acres from 108.33 to 108.6 acres (-0.7%). 33.31 acres are expected to be destroyed by live fire in Cluster 560's 0.5-mile radius foraging partition leaving 135.18 acres (-19.8%).

Cavity Trees

Live fire training on the completed range will result in the loss of 63 cavity trees within the direct line of fire (DFL)(Table 4-7). No cavity trees will remain in clusters 110, 112, 113 or 194. Three of the four remaining cavity trees in Cluster 115 will be eliminated. Eight of nine cavity trees in Cluster 603 are within the DFL, and one is in the Dispersion Area.

Loss of cavity trees to live fire training will eliminate roosting sites for all members of five PBGs (Clusters 110, 112, 113, 194, and 603) and essentially all members of Cluster 115 (one out of 17 cavity trees remaining).

As discussed in the Range Construction section, average group size may range from 2.76 to 3.07 adults per breeding group on Fort Bragg. With total and near-total cluster loss, we can expect at least 17 or 18 RCWs including breeding birds and associated helpers will be exposed to the elements and potentially lost from the population. These calculations do not account for floater (adults not affiliated with a breeding group) or first-year RCWs that may be difficult to detect.

Independent of loss of foraging habitat, six PBGs will be lost from within the management unit due to loss of available cavities. The 17 or 18 displaced individual RCWs are likely to venture into neighboring clusters seeking suitable roosting cavities. PBGs in the neighboring clusters will have already been disturbed by the 19 to 22 RCWs previously displaced by range construction.

Dispersing RCWs from the affected clusters will fight with members of these neighboring groups and attempt to usurp those RCWs from their roosting cavities. Resident RCWs in these clusters will either succeed or fail to defend their cavities from RCWs expelled by the Action. Some of these will be displaced and forced to seek available cavities elsewhere outside of the live fire area.

Removal and destruction of 577.89 acres of PGQFH within the 0.5-mile radius foraging partitions of eleven RCW PBGs will result in irretrievable loss of five of those PBGs. These losses will be due to reducing PGQFH acreage below the minimum acreage (75 acres) and the proportion of currently available habitat lost from these five partitions which will range from about 59% to 100%. PBGs lost due to habitat removal and destruction include those residing in clusters 110, 112, 113, 194 and 603. Sufficient foraging habitat for clusters 22, 149, 151, 167, 251, 452 and 560 would remain post-project to support one PBG in each partition.

Clusters 110, 112, 113, 194, and 603, and their associated RCW PBGs will be lost from the Sandhills East Primary Core Recovery Population due to a combination of foraging, nesting and roosting habitat removal or damage. Displaced RCWs from these clusters may initially retreat into the foraging partitions immediately adjacent to the range clearing, disrupting essential life history functions of at least 13 clusters outside of this phase of the Action. Family group composition of these neighboring PBGs will be disrupted and more RCWs will be reliant on the diminished amount of foraging habitat available to all groups adjacent to range clearing and pine forest within the DFL.

4.3.3. Avoidance and Minimization

As summarized above (Range Construction), 91 cavity trees will be cut down to create the range. Immediately before the trees are cut, available cavities within the trees will be covered (screened) to prevent access by RCWs. This action will preclude direct loss of individual RCWs that might remain in cavities and could be injured or killed as each cavity tree is felled.

Cavity trees won't be cut during the nesting season (April – July). Roosting space will remain available to all adult members of affected potential breeding groups during the breeding season to allow the breeding pair and helpers to participate in incubation and servicing nestlings/ fledglings until a few weeks after fledging. Having all adult members present and taking care of the brood will improve the potential survival of young until all cavities and habitat are removed.

Fort Bragg will conduct cavity provisioning (cluster management) within suitable nesting habitat outside of the range clearing limits, direct fire line and dispersion area. The location of replacement cavities will be limited to areas containing a sufficient number of trees with diameter and age to withstand cavity insertion; and where there may be acreage within neighboring partitions to prospectively support an extra RCW group.

These activities may provide opportunities for RCWs displaced by range construction and operations to find roosting sites. Effects to individual RCWs and group survival are likely to be unstable for a year or two (two to four dispersal cycles). Dominant group members from eliminated clusters may displace less dominant RCW group members in neighboring/nearby groups. Displaced birds may use newly provisioned cavities or select cavities in existing clusters. Secondly usurped RCWs may also use newly provisioned artificial cavities.

All cavity trees in Cluster 251 will be removed for construction of the Range Operations Control Area (ROCA). However, sufficient foraging habitat will remain post-project to support the existing breeding group. Replacement cavities will be provisioned outside of the range clearing limits to offset the loss of existing cavity trees. This minimization measure could potentially prevent the loss of the PBG residing in Cluster 251, depending in part on the availability of pines large and/or old enough to support an artificial cavity and their proximity to the current cluster.

4.3.4. Pine Thinning and Midstory Removal

The timeline for pine thinning and midstory hardwood removal (forest management) outlined in the BA will be advanced so that these activities will take place just before or during the range construction phase. Forest management will take place throughout the Sandy Grove TAG outside of the range clearing and DFL and will involve at least 3,743 pine-forested acres. The primary objective of timber management is to re-establish and maintain forest structure to meet desired ecological conditions which include reduction of over-stocked small pines and hardwoods. A critical part of the proposed action is retention of large, old pines (e.g., ≥ 14 inches DBH) in the Action Area outside of the range.

Use of feller-bunchers and skidders within RCW foraging habitat will cause temporary disturbance to resident RCW groups, but should not have long-lasting effects to life history needs. Use of this equipment will also cause disturbance (scarification) to native ground cover including sensitive, native grasses and herbaceous species over 3,742 acres. Tractors may inadvertently scar leave trees.

Timber management will take place within the 0.5-mile foraging partitions for at least 45 managed RCW clusters. Retention of the large, old pines prioritizes conservation of the most important foraging and potential roosting and nesting habitat (future cavity trees) within the Action Area. Reducing stocking of dense young pines and prescribed hardwood control will move stand conditions toward good quality habitat objectives expressed in the RCW Recovery Plan for both the Recovery Standard and the Standard for Managed Stability. Proposed timber management is expected to improve RCW access to and use of pine-forested acres within the affected partitions. These improvements are likely to enhance continued survival of existing RCW groups using occupied habitat where these actions take place. Fire management outlined in the installation's INRMP and subordinate plans are likely to extend ecological benefits created by the proposed timber management. These activities may increase the capacity of residual habitat to support PBGs displaced by habitat lost in construction and use of the range. The degree to which capacity may be increased is unknown.

4.3.5. Summary

About 400.47 acres of occupied foraging habitat will be cut during range creation; an additional 338.9 acres will be destroyed during completion of the range and initial down-range live fire training. These impacts will cause or significantly contribute to the loss of six PBGs. Live fire training will cause the loss of about 558.19 acres of occupied foraging habitat in partitions for six PBGs. These groups will be lost from the population due to habitat destruction. A total of 12 PBGs will be eliminated from the NC Sandhills Primary Core Recovery Population. Foraging habitat will be lost in six additional foraging partitions (totaling 53.01 acres): clusters 22, 149, 151, 167, 452 and 560, but these losses will not result in group loss (Table 4-9).

Range clearing will take out 91 cavity trees providing roosting habitat to eight PBGs. Seven PBGs may be eliminated. One of these (Cluster 251) may be retained through provisioning (cluster management). Range operation will involve the loss or destruction of 68 cavity trees. Live fire training will lead to loss of five additional PBGs.

Of the 12 clusters to be cut, damaged or destroyed (losing more than 80% of their cavity trees), 11 will lose more than 50% of currently available PGQFH within their 0.5-mile radius foraging partitions. While Cluster 251 will be cut during range construction, sufficient foraging habitat will remain within its foraging partition to support a PBG. Loss of this group may be avoided through cluster management if sufficient large trees are available to support provisioning.

Loss of roosting, nesting and foraging habitat associated with the Action will deprive approximately 36 to 40 individual RCWs of essentially all previously available survival resources. Displaced RCWs will initially disperse into habitat immediately adjacent to the range clearing and tree loss areas. This habitat is already occupied by neighboring RCW groups. Family group composition of these neighboring PBGs will be disrupted. Displaced breeding groups may attempt to take over clusters and foraging habitat of neighboring PBGs. This upheaval will disrupt essential life functions of at least 13 PBGs outside of range clearing, construction and range operation. More RCWs will be reliant on the diminished amount of foraging habitat available to all groups adjacent to range clearing.

Demographic effects may not be limited to PBGs occupying neighborhood clusters but may extend outside of the Action Area neighborhood and throughout the Sandhills East Primary Core Recovery Population. These effects will include usurpation of individual RCWs from their roosting cavities and changes in pair composition where one or both members of a breeding pair are replaced by displaced RCWs. Approximately half (18 to 20) displaced RCWs may attempt to usurp RCWs from their cavities in PBGs within the 3.7-mile radius Action neighborhood. We estimate that less than 20 individual RCWs, either directly affected by habitat loss or usurped from their cavities by displaced RCWs will be taken by predators, succumb to the elements, killed by another RCW or other cavity-dependent species or lost from the population by other means.

Approximately 20 displaced adult male RCWs, especially breeding males directly affected by cavity loss are likely to remain in residual habitat close to where their roosting cavities were. A few female RCWs may remain in neighboring clusters and residual habitat. Many will disperse and may displace current breeding females in other PBGs. A small number of RCWs representing all demographic categories (e.g., breeding males, breeding females, helpers, female floaters, etc.) will spend weeks or months seeking available positions in existing PBGs or vacant habitat.

Cavity provisioning (cluster management) is included as a part of the proposed action. The location of new artificial clusters will be limited in part by the locations of extant pine trees with sufficient diameter and age to withstand cavity drilling or insertion. Cluster management will take into account the ability of available foraging habitat to support a displaced individual RCW or PBG. Cluster management (cavity provisioning) may be successful in conserving between eight and 10 individual RCWs that will lose their cavities as a direct result of the Action. Up to four active clusters may be assembled through cluster management. These activities may help retain one or two of the originally displaced PBGs, but group membership for most of the 12 PBGs is expected to be reduced. Most, if not all of the 12 PBGs will be lost.

Timber management will involve at least 3,743 pine-forested acres and will take place within the 0.5-mile foraging partitions for at least 45 managed RCW clusters. Retention of the large, old pines prioritizes conservation of the most important foraging and potential roosting and nesting habitat (future cavity trees) within the Action Area. Proposed timber management is expected to improve RCW access to and use of pine-forested acres within the affected partitions. These improvements are likely to enhance continued survival of existing RCW groups using occupied habitat where these actions take place. Fire management outlined in the installation's INRMP and subordinate plans are likely to extend ecological benefits created by the proposed timber management.

4.3.6. Tables and Figures

Table 4-1: RCW foraging partitions within the range clearing limits.

CLUSTER/ PARTITION #	STATUS	PGQFH PRE- PROJECT (ACRES)	PROJECT REMOVAL RANGE AND DFL (ACRES)	% REMOVAL	PGQFH POST- PROJECT (ACRES)
114	BRE	82.86	82.86	100.0%	0
251	BRE	217.60	48.11	22.1%	169.49
271	BRE	143.62	103.56	72.1%	40.06
272	BRE	233.11	165.94	71.2%	67.17
			400.47		

Table 4-2: RCW foraging partitions within a combination of range clearing limits and anticipated down-range impacts.

CLUSTER/ PARTITION #	STATUS	PGQFH PRE- PROJECT (ACRES)	PROJECT REMOVAL RANGE AND DFL (ACRES)	% REMOVAL	PGQFH POST- PROJECT (ACRES)
111	BRE	108.22	108.22	100.0%	0
115	BRE	153.81	118.44	77.0%	35.37
152	BRE	121.02	112.24	92.7%	8.78
			338.9		

Table 4-3: Number of cavity trees removed as a result of range clearing and construction.

CLUSTER NUMBER	STATUS	TOTAL NUMBER OF CAVITY TREES	NUMBER OF CAVITY TREES REMOVED	PROPORTION REMOVED
111	BRE	17	17	100%
114	BRE	16	16	100%
115	BRE	17	13	76.4%
152	BRE	9	9	100%
194	BRE	13	1	7.6%
251	BRE	11	11	100%
271	BRE	15	15	100%
272	BRE	9	9	100%
TOTAL		108	91	

Table 4-4: Summary of RCW roosting and foraging habitat loss due to range construction and initial training.

CLUSTER/ GROUP #	STATUS	PROPORTION PGQFH LOST	PROPORTION CAVITY TREES LOST	PBG LOST DUE TO FORAGING LOSS	PBG LOST DUE TO CAVITY TREE LOSS
111	BRE	100%	100%	X	X
114	BRE	100%	100%	X	X
115	BRE	77%	76.4%	X	X
152	BRE	92.7%	100%	X	X
194	BRE	0%	7.6%		
251	BRE	22.1%	100%		X
271	BRE	72.1%	100%	X	X
272	BRE	71.2%	100%	X	X

Table 4-5: RCW foraging partitions with significant habitat loss due to down-range impacts subsequent to range clearing.

CLUSTER/ PARTITION #	STATUS	PGQFH PRE- PROJECT (ACRES)	PROJECT REMOVAL (PGQFH) RANGE AND DFL (ACRES)	% REMOVAL	PGQFH POST- PROJECT (ACRES)
22‡	ACT	275.19	0	0.0%	275.19
110‡	ACT	68.13	53.93	79.2%	14.2
112	BRE	45.92	45.92	100.0%	0
113	BRE	207.21	205	98.9%	2.21
194	BRE	157.88	156.81	99.3%	1.07
560	BRE	168.49	33.31	19.8%	135.18
603*	BRE*	105.72	63.22	59.8%	42.5
			558.19		

‡ = not monitored since it is in McPherson Impact Area (could be a PBG). ‡ = captured by neighboring group. * = Based on 2021 breeding season data.

Table 4-6: RCW foraging partitions affected only by down-range impacts (DFL).

CLUSTER/ PARTITION #	STATUS	PGQFH PRE- PROJECT (ACRES)	PROJECT REMOVAL (PGQFH)	% REMOVAL	PGQFH POST- PROJECT (ACRES)
22	ACT	275.19	0	0.0%	275.19
149	BRE	225.56	16.57	7.3%	208.99
151	BRE	197.91	1.3	0.7%	196.61
167	BRE	209.69	1.1	0.5%	208.59
452	BRE	109.33	0.73	0.7%	108.6
560	ACT	168.49	33.31	19.8%	135.18
			53.01		

Table 4-7: Number of cavity trees destroyed or eliminated as a result of range operations.

CLUSTER NUMBER	STATUS	TOTAL NUMBER OF CAVITY TREES	NUMBER OF CAVITY TREES CUT – RANGE CLEARING	NUMBER OF CAVITY TREES DESTROYED – LIVE FIRE	NUMBER OF CAVITY TREES DESTROYED – DISPERSION	PROPORTION REMOVED
110	ACT	19	0	19	0	100%
112	BRE	5	0	5	0	100%
113	BRE	12	0	12	0	100%
115	BRE	17	13	3	0	82.4%
149	BRE	16	0	0	2	6.3%
194	BRE	13	1	12	0	100%
452	BRE	13	0	0	1	7.7%
603	BRE	9	0	8	1	100%
2500	No mgmt	N/A	0	4	1	N/A
TOTAL		104	14	63	5	

Table 4-8: Summary of RCW roosting and foraging habitat loss due to live fire training within the DFL area.

CLUSTER/ GROUP #	STATUS	PROPORTION PGQFH LOST	PROPORTION CAVITY TREES LOST	PBG LOST DUE TO FORAGING LOSS	PBG LOST DUE TO CAVITY TREE LOSS
22	PBG	0%	0%		
110	PBG	79.2%	100%	X	X
112	PBG	100%	100%	X	X
113	PBG	98.9%	100%	X	X
149	PBG	7.3%	0%		
151	PBG	0.7%	0%		
167	PBG	0.5%	0%		
194	PBG	99.3%	100%	X	X
452	PBG	0.7%	0%		
560	PBG	19.8%	0%		
603	PBG	59.8%	100%	X	X

Table 4-9: Summary of direct effects of range construction and operation on RCW foraging habitat.

PARTITION #	STATUS	PROJECT AREA	PGQFH PRE-PROJECT	PROJECT REMOVAL (PGQFH) RANGE & DFL	% REMOVAL	PGQFH POST-PROJECT
22	ACT	Direct Fire	275.19	0	0.0%	275.19
110	ACT	Range/Direct	68.13	53.93	79.2%	14.2
111	BRE	Range/Direct	108.22	108.22	100.0%	0
112	BRE	Range/Direct	45.92	45.92	100.0%	0
113	BRE	Range/Direct	207.21	205	98.9%	2.21
114	BRE	Range	82.86	82.86	100.0%	0
115	BRE	Range/Direct	153.81	118.44	77.0%	35.37
149	BRE	Direct Fire	225.56	16.57	7.3%	208.99
151	BRE	Direct Fire	197.91	1.3	0.7%	196.61
152	BRE	Range/Direct	121.02	112.24	92.7%	8.78
167	BRE	Direct Fire	209.69	1.1	0.5%	208.59
194	BRE	Range/Direct	157.88	156.81	99.3%	1.07
251	BRE	Range	217.60	48.11	22.1%	169.49
271	BRE	Range	143.62	103.56	72.1%	40.06
272	BRE	Range	233.11	165.94	71.2%	67.17
452	BRE	Direct Fire	109.33	0.73	0.7%	108.6
560	ACT	Direct Fire	168.49	33.31	19.8%	135.18
603*	BRE*	Range/Direct	105.72	63.22	59.8%	42.5
		Total Acres:	2831.27	1317.26		1514.01

Table 4-10: Total number of cavity trees removed, damaged or destroyed.

CLUSTER NUMBER	STATUS	TOTAL NUMBER OF CAVITY TREES	NUMBER OF CAVITY TREES CUT – RANGE CLEARING	NUMBER OF CAVITY TREES DESTROYED – LIVE FIRE	NUMBER OF CAVITY TREES DESTROYED- DISPERSION	PROPORTION REMOVED
110	ACT	19	0	19	0	100%
111	BRE	17	17	0	0	100%
112	BRE	5	0	5	0	100%
113	BRE	12	0	12	0	100%
114	BRE	16	16	0	0	100%
115	BRE	17	13	3	0	82.4%
149	BRE	16	0	0	2	6.3%
152	BRE	9	9	0	0	100%
194	BRE	13	1	12	0	100%
251	BRE	12	11	0	0	100%
271	BRE	15	15	0	0	100%
272	BRE	9	9	0	0	100%
452	BRE	13	0	0	1	7.7%
603	BRE	9	0	8	1	88.9%
2500	No Mgmt	N/A	0	4	1	N/A
TOTAL		182	91	63	5	

Table 4-11: Summary of impacts to clusters/partitions caused by adverse effects of the Action.

CLUSTER/ PARTITION #	STATUS	PROJECT AREA	PROPORTION PGQFH LOST	PROPORTION CAVITY TREES LOST	PBG LOST DUE TO FORAGING LOSS	PBG LOST DUE TO CAVITY TREE LOSS
22	ACT	Direct Fire	0%	0%		
110	ACT	Range/Direct	79%	100%	X	X
111	BRE	Range/Direct	100%	100%	X	X
112	BRE	Range/Direct	100%	100%	X	X
113	BRE	Range/Direct	98.9%	100%	X	X
114	BRE	Range	100%	100%	X	X
115	BRE	Range/Direct	77%	76.4%	X	X
149	BRE	Direct Fire	7.3%	0%		
151	BRE	Direct Fire	0.7%	0%		
152	BRE	Range/Direct	92.7%	100%	X	X
167	BRE	Direct Fire	0.5%	0%		
194	BRE	Range/Direct	99.3%	100%	X	X
251	BRE	Range	22.1%	100%		X
271	BRE	Range	72.1%	100%	X	X
272	BRE	Range	71.2%	100%	X	X
452	BRE	Direct Fire	0.7%	0%		
560	ACT	Direct Fire	19.8%	0%		
603*	BRE*	Range/Direct	59.8%	100%	X	X

4.4. Cumulative Effects on the Red-cockaded Woodpecker

In section 3, we did not identify any activities that satisfy the regulatory criteria for sources of cumulative effects. Therefore, cumulative effects to the RCW are not relevant to formulating our opinion for the Action.

4.5. Conclusion for the Red-cockaded Woodpecker

In this section, we summarize and interpret the findings of the previous sections (status, baseline, effects, and cumulative effects) relative to the purpose of the BO for the red-cockaded woodpecker (RCW), which is to determine whether the Action is likely to jeopardize its continued existence.

Status

RCW management, directed by conservation science in the 1990's focused on the species' recovery, promoted stabilization of many RCW populations throughout its range. The rangewide population has increased from about 4,694 active clusters in 1993 to nearly 7,800 active clusters currently. Results of analyses summarized in the RCW SSA Report (Service 2020) indicate that

RCWs even in low (30-99 active clusters) or very low (<30 active clusters) resilience categories respond affirmatively to management.

The positive state of current RCW distribution and abundance is primarily due to intensive management, including prescribed fire, artificial cavities, translocations, conservation of old pines and other activities. RCWs now occupy a patchy distribution from extreme southern Virginia south to Florida and west to Texas and Oklahoma. The Service estimates there are at least 7,794 active RCW clusters rangewide across 11 states distributed as 124 demographic populations from as small as one active cluster to as large as 858 active clusters.

Of the 124 populations analyzed in the RCW SSA, the North Carolina Sandhills population, which includes the Sandhills East Primary Core Recovery Population is one of three that are classified as having very high resilience. The other two are Apalachicola National Forest-St. Marks NWR-Tate's Hell State Forest and Eglin Air Force Base. Three are classified as high (Francis Marion National Forest-Bonneau Ferry WMA- Santee Coastal Reserve WMA, Fort Stewart and Fort Benning), 10 as moderate, 37 as low, and 71 as very low.

Of 124 current demographically delineated populations, redundancy of very high (3) and high (3) resilience populations is low. Redundancy of very highly to moderately resilient populations also is low within and among ecoregions. While the total number of populations makes the species appear to have greater redundancy, this redundancy is comprised of populations of low or very low resilience. Of the 13 ecoregions with current populations, those with high (3) or very high (3) resilient populations are restricted to only four regions: Mid-Atlantic Coastal Plain, East Gulf Coastal Plain, South Atlantic Coastal Plain, and Sandhills. Only two ecoregions, the East Gulf Coastal Plain and the Sandhills, have more than one population classified as of high or very high resilience, and only these two regions have more than two populations classified as moderately to very high resilience.

Only four ecoregions (South Atlantic Coastal Plain, Mid-Atlantic Coastal Plain, West Gulf Coastal Plain, Upper East Gulf Coastal Plain) have two populations of moderate to high resilience, and thus some level of redundancy in terms of relatively resilient populations. All of the populations in six ecoregions (Cumberland Ridge and Valley, Florida Peninsula, Gulf Coast Prairie Marshes, Mississippi River Alluvial Plain, Ouachita Mountains, and Piedmont) are of low or very low resilience, but are important for representation in their respective regions and across the range.

Current RCW populations are highly dependent on active conservation management. Favorable practices include application of prescribed fire, beneficial and compatible silvicultural methods to regulate forest composition and structure, provisioning of artificial cavities where natural cavities are insufficient, translocation to sustain and increase small vulnerable populations, and effective monitoring to identify limiting biological and habitat factors for management. Apart from a future condition when forests consist of pines of suitable age, number and abundance for natural cavities, there is no future point or condition when RCW populations will not be dependent on continued active management due to the need to regularly apply prescribed fire. The vast majority of all current populations continue to depend upon artificial cavities. All of these future active management measures require substantial organizational resources with staff

and funding at populations managed for conservation and recovery. Fiscal year budgets for federal, state, and other public agencies are not expected to increase in future years. Further, there is increasing uncertainty among some agencies on their ability to sustain future RCW conservation and management with other agency missions and objectives for their lands.

Also, climate change has the potential to influence productivity and the distribution of vegetative communities, such as longleaf pine systems, through anticipated changes in temperature and precipitation patterns. RCW females that lay eggs earlier in warmer climates and in response to increasing temperature from climate change are more productive, but inbred and inexperienced females lay later and are less productive (Schiegg et al. 2002). This underlies the importance of having RCW populations represented throughout the latitudinal and longitudinal extent of the species range.

Baseline

The RCW clusters, PBGs and supporting foraging habitat within the Action Area are a key part of the matrix of RCW territories comprising the Sandhills East Primary Core Recovery Population. Range construction and operation will substantially and directly affect 11 RCW clusters. Clearing limits of the range and/or direct fire will affect seven additional 0.5-mile radius foraging partitions. Thirty-one RCW clusters and 44 0.5-mile radius foraging partitions are within or overlap the Action Area. 130 active clusters and/or their foraging habitat fall within 3.7 miles of the range clearing and live fire associated with the Action. The 3.7 mile distance represents approximately the 95th percentile of the distance juvenile females foray from their natal territory to search for a breeding vacancy in another territory (Service 2020). Juvenile female RCWs disperse except for rare instances when they remain as a nonbreeding helper.

Eighteen active clusters will be directly affected by habitat loss. Fifteen of these are occupied by potential breeding groups. The 0.5-mile foraging partitions for five encompass less than 120 acres of potential good quality foraging habitat.

The centers of 11 active clusters (clusters 22, 109, 149, 151, 167, 252, 269, 273, 452, 517 and 560), fall within a 0.5-mile radius of the Action Area clearing limits. These clusters are mostly peripheral to proposed tree loss associated with the Action. Of these, minor amounts of available foraging habitat will be removed from 0.5-mile radius partitions for clusters 22, 149, 151, 167, 452, and 560. Cluster 149 will lose two out of 16 cavity trees. A total of 46 active clusters fall within 1.25 miles of these clusters with 39 maintaining over 120 acres of potential good quality foraging habitat (PGQFH). The 11 active clusters had pre-project densities between 13 and 20 groups (average density = 11.27 groups) within 1.25 miles of the affected cluster's center. All clusters analyzed within 1.25 miles had densities ≥ 9.0 active groups post-project. (Fort Bragg 2021).

RCW conservation on Fort Bragg is guided by the Endangered Species Management Component (ESMC), Appendix B. 2 of the INRMP. The ESMC guides the installation to apply ecosystem management to conserve training lands. The Department of Defense (DoD) mandated the use of ecosystem management as the primary basis for natural resource management on all military installations (DoD Instruction 4715.3; Environmental Conservation Program). Fort Bragg's

RCW populations have been a major beneficiary of these practices, but their effects are essential to the full suite of native plant and wildlife species the installation seeks to conserve.

One of the goals outlined in the ESMC is to expand the installation's RCW populations to reach habitat carrying capacity. One of the responsibilities of the Training Lands Working Group is to ensure that training area prescriptions adhere to ecosystem management guidance contained in the INRMP. Fort Bragg may provision recruitment clusters where unoccupied habitat is made suitable. This guidance includes managing RCW management areas to meet Recovery Standard criteria for good quality habitat, including the production and retention of old growth pine trees and restoration/maintenance of native ground cover through application of growing season fire on a one to three-year rotation.

Fort Bragg's population comprises most of the Sandhills East Primary Core Population, one of two primary core populations in the Sandhills Recovery Unit. Fort Bragg contains over 83% of the Sandhills East Primary Core Recovery Population and over 63% of the combined Sandhills East Primary Core and Sandhills West Essential Support Populations.

Implementation of proactive habitat management included growing season prescribed burns, hardwood midstory control, thinning of dense stands of young pines, and a carefully administered artificial cavity provisioning program has enabled consistent RCW population growth since the early 1990's. With inclusion of additional PBGs on NCSCP lands, Fort Bragg became the first military installation and primary core recovery population to reach its population goal (350 PBGs) under the 2003 RCW Recovery Plan in 2005.

Monitoring during the 2020 breeding season documented 521 active clusters and an estimated 461 PBGs on Fort Bragg. The NCSCP, a program that has increased the number of clusters counted towards recovery goals by protecting additional groups on adjacent lands in perpetuity, added 33 PBGs. Although subject to change in response to RCW budding/pioneering and changes to habitat carrying capacity, the latest installation population management goal is 547 managed clusters.

Fort Bragg contains 105,629 acres of potentially suitable habitat. This acreage includes areas of unoccupied suitable habitat that could support additional RCW groups. Additional RCW groups could enhance Fort Bragg's ability to maintain the population at recovery levels by providing critical demographic connectivity.

The dispersal distance metric for juvenile female red-cockaded woodpeckers (3.7 miles) was useful in determining the primary neighborhood for examining effects of habitat loss that are part of the proposed Action. Gap avoidance by dispersing juvenile females also is important behavior to consider for describing effects of habitat fragmentation. Gaps greater than 150 meters (492 feet) are not absolute barriers during forays, but the probability of crossing gaps greater than 150 meters diminishes substantially with increasing gap size with rare movement across gaps greater than 600 meters (1969 feet) (Kesler et al. 2010, Walters et al. 2011, Bruggeman and Jones 2014).

This 600-meter measurement was part of the process of delineating demographic populations in the RCW SSA Report. A sufficient distribution of 600-meter-plus gaps, that would cause a

dispersing bird to take a highly circuitous route in the 3.7-mile distance between active clusters, indicate that cluster aggregations are in different demographic populations.

There are several large open areas on Fort Bragg distributed through the managed RCW habitat matrix that could influence or impede dispersal of juvenile female RCWs. The five largest drop zones: Sicily, Holland, Normandy, St. Mere Eglise, Salerno, and Nijmegen, all are at least 600 meters across. The largest, Sicily Drop Zone, is over 1,000 meters wide and nearly 5,600 meters long.

The largest non-forested acreages are in the Impact Areas. The McPherson Impact Area north of the Action Area is among the largest breaks in RCW habitat matrix. Two other are within the Coleman Impact Area to the east. One open section of the Coleman Impact Area is over 1,900 acres in size. Gaps in these areas may span more than 1,500 meters across.

Fort Bragg is tracking other potential sources of habitat fragmentation that might isolate the Northeast Area (NEA) from the remainder of the installation's main population. Habitat loss in this area could contribute to genetic and demographic separation of these groups from the greater RCW population. RCW groups in the NEA are currently connected to the remainder of the Fort Bragg population by a narrow corridor of fragmented habitat known as the Greenbelt, which runs along the southern and western boundaries of the MCA.

The northern connector was identified by the NCSCP RCW Strategy Working Group as another potential conduit for demographic/genetic exchange. The northern connector is currently recognized as a critical link for maintaining demographic connectivity between the NEA and the remainder of Fort Bragg (Walters 2005a). Efforts are also focused on the protection of forested lands between the NEA and the Overhills tract.

The three largest impact areas (McPherson, Coleman, and MacRidge) are located in the central portion of Fort Bragg. Fort Bragg's impact areas and firing ranges contain approximately 85 active RCW clusters (Fort Bragg, Unpublished 2015 Activity Status Data). The interior portions of the two largest impact areas (McPherson and Coleman) are mostly devoid of mature trees; however, the periphery of these impact areas contain quality habitat that is critically important for maintaining demographic connectivity of the overall population. The McPherson and Coleman impact areas contain a total of 48 active clusters. The remaining two impact areas on Fort Bragg (MacRidge and Manchester) contain a total of 37 active clusters in both peripheral and interior areas. Although some clusters within the interior portions of impact areas were historically color-banded, none are currently banded or intensively monitored.

Significant portions of the impact areas and ranges are managed for the RCW. Habitat management activities include prescribed fire, herbicide treatments, and pine thinning. Prescribed fires are especially important for ecosystem management and as a means of reducing the potential for wildfires in these areas. Fort Bragg's prescribed fire program attempts to mimic natural wildland fire cycles by scheduling managed woodlands for implementation during the growing season on a one to three-year rotation. Approximately one-third of the installation is scheduled for prescribed burning each year. Site-specific fire prescriptions are prepared based on restoration status and habitat management objectives. Prescriptions include provisions to avoid

adverse effects on overstory pines, endangered species habitats, and other significant habitat features. Habitat restoration and management within these areas are equally beneficial to the training mission.

Effects

The Action will cause the removal and destruction of 1,317.26 acres of occupied, potential good quality foraging habitat supporting 18 red-cockaded woodpecker potential breeding groups (PBGs). This amount of habitat loss will result in the loss of 11 PBGs from the NC Sandhills East Primary Core Recovery Population: clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272, and 603.

Site preparation for range construction will take out 91 cavity trees that currently provide roosting habitat for eight PBGs; Seven of these will be eliminated. One, Cluster 251 may be retained through provisioning (cluster management) as part of the proposed Action. Range operation will involve the loss or destruction of 68 cavity trees providing roosting habitat to seven PBGs. Five of these may be eliminated by the effects of live fire training.

Of the 12 clusters to be cut, damaged or destroyed, 11 will lose more than 50% of currently available PGQFH within their 0.5-mile radius foraging partitions. While Cluster 251 will be cut during range construction, sufficient foraging habitat will remain within its foraging partition to support a PBG. Loss of this group may be avoided through cluster management if sufficient large trees are available nearby to support provisioning. The PBGs lost due to foraging habitat impacts are the same that will be lost due to loss of cavities.

Loss of roosting, nesting and foraging habitat associated with the Action will deprive approximately 36 to 40 individual RCWs of essential survival resources. Displaced RCWs will venture into habitat occupied by adjacent groups. Family group composition of neighboring PBGs will be disrupted. Displaced breeding groups may attempt to take over clusters and foraging habitat of neighboring PBGs. The BA identifies 130 PBGs and/or associated habitat within the RCW 3.7-mile radius analysis neighborhood. Effects to group composition may extend beyond the neighborhood.

Approximately half (18 to 20) displaced RCWs may attempt to usurp RCWs from their cavities in PBGs within the 3.7-mile radius Action neighborhood. Less than 40 RCWs originally residing in the neighborhood may be forced out of their territories and a small number may disperse from the neighborhood into the greater Sandhills population. Less than 20 individual RCWs, either directly affected by habitat loss or usurped from their cavities by displaced RCWs will be taken by predators, succumb to the elements, will be killed by another RCW or other cavity-dependent species or lost from the population by other means. As many as 20 displaced adult male RCWs, especially breeding males directly affected by cavity loss are likely to remain in residual habitat close to where their roosting cavities were.

Cavity provisioning (cluster management) is included as a part of the proposed action. The location of new artificial clusters will be limited in part by the locations of extant pine trees with sufficient diameter and age to withstand cavity drilling or insertion. Cluster management will

take into account the ability of available foraging habitat to support a displaced individual RCW or PBG, and the potential for cluster management to interfere with extant neighboring RCW groups. Less than 11 immediately displaced PBGs may be sustained in the action area by way of cavity provisioning. Cluster management is likely to be successful in sustaining the PBG at Cluster 251. The specific number of directly displaced PBGs that may be conserved will depend on adjacent habitat quality, the stocking of pine trees \geq 14 inches DBH and proximity of replacement clusters to extant occupied clusters.

Timber management focused on attaining expressed, desired RCW habitat conditions will be implemented on about 3,743 acres within the Action Area. Benefits of this action may extend to occupied foraging habitat for 45 active clusters. Management will feature retention of large, old pines within the remaining RCW habitat matrix to provide essential foraging and potential roosting and nesting habitat (future cavity trees). Improvements to forest structure are likely to enhance extant RCW group survival where these actions take place. Fire management outlined in the installation's INRMP and subordinate plans are likely to extend ecological benefits created by the proposed timber management.

Baseline habitat conditions supporting the 11 adversely/directly affected clusters are very good as a result of INRMP/ ESMC implementation, including the installation's fire management program. RCW cluster distribution and the distribution of manageable habitat is conducive to long-term conservation of the Sandhills East Primary Core Recovery Population. Habitat loss will involve 1,317.26 containing essential RCW conservation resources, including sufficient numbers of high quality, mature longleaf pine trees that support ecological benefits for 18 RCW PBGs within the Action Area. The project will reduce capacity of the conservation landscape by 11 PBGs. Fort Bragg will still be able to manage for at least 450 PBGs on the main installation.

Range construction and operation will significantly add to RCW habitat fragmentation. The habitat matrix supporting Fort Bragg's portion of the Sandhills East Population (105,629 acres of potentially suitable habitat; Fort Bragg 2021) already contains numerous enormous gaps, including five large drop zones and within three main impact areas. The deleted pine forest acreage adds to thousands of previously cleared acres within the 3.7-mile radius Action Neighborhood, which includes the McPherson Impact Area. The cleared range will be over 3,000 meters long and 600 meters wide, sufficiently large to have effects on RCW dispersal, especially dispersal of juvenile females. However, sufficient connectivity should remain within managed habitat south and north of the Action Area to ensure effective dispersal of potential breeding RCWs.

Cumulative Effects

In its request for consultation, Fort Bragg did not describe, and the Service is not aware of, any future non-Federal activities that are reasonably certain to occur within the Action Area. Therefore, we anticipate no cumulative effects that we must consider in formulating our opinion for the Action.

Opinion

The 11 PBGs that will be lost as a result of the Action are members of a well-managed portion of the Sandhills East Primary Core Recovery Population residing on Fort Bragg. With over 460 active clusters, the installation contains about 83% of the Sandhills East Primary Core Recovery Population and over 63% of the combined Sandhills East Primary Core and Sandhills West Essential Support Populations. NC Sandhills East is one of 13 primary core recovery populations, and Sandhills West is one of 16 essential support populations identified in the Recovery Plan.

Out of 124 RCW populations analyzed in the RCW SSA Report (Service 2020), the North Carolina Sandhills population (including both the Sandhills East Primary Core and Sandhills West Essential Support populations) is one of only three populations classified with very high resilience. Redundancy of very high (3) and high (3) resilience populations is low. Only two ecoregions, the East Gulf Coastal Plain and the Sandhills have more than one population that are classified as of high or very high resilience, and only these two regions have more than two populations classified as moderate to very high resilience.

Of the 13 ecoregions with current populations, those with high (3) and very high resilience (3) are restricted to only four regions: Mid-Atlantic Coastal Plain, East Gulf Coastal Plain, South Atlantic Coastal Plain, and Sandhills. Only two ecoregions, the East Gulf Coastal Plain and the Sandhills, have more than one population classified as of high or very high resilience, and only these two regions have more than two populations classified as moderately to very high resilience. Only four ecoregions (South Atlantic Coastal Plain, Mid-Atlantic Coastal Plain, West Gulf Coastal Plain, Upper East Gulf Coastal Plain) have two populations of moderate to high resilience, and thus some level of redundancy in terms of relatively resilient populations. All of the populations in six ecoregions (Cumberland Ridge and Valley, Florida Peninsula, Gulf Coast Prairie Marshes, Mississippi River Alluvial Plain, Ouachita Mountains, and Piedmont) are of low or very low resilience, but are important for representation in their respective regions and across the range. Redundancy in the Sandhills Ecoregion is notable because of six different populations, two are in the high and very high resilience category.

Impacts of the proposed Action on the RCW are limited to the managed RCW subpopulation on Fort Bragg comprised of between 450 and 460 active RCW clusters. Removal and destruction of 1,317.26 acres of pine-forested habitat will result in the loss of 11 PBGs within Fort Bragg's habitat management areas. The proposed Action will measurably contribute to habitat fragmentation already present both inside and outside of the Action Area. However, sufficient habitat connectivity will remain to support adequate transfer of naturally dispersing RCWs seeking breeding vacancies in neighboring PBGs.

Pine thinning and midstory removal within the Action Area will enhance the residual habitat's ability to support RCW groups in the analysis neighborhood peripheral to the 11 PBGs lost in the proposed action. Protection of high quality, mature pine trees may enable the Action Area to retain one or two PBGs directly affected by habitat loss. Cluster management associated with the Action may reduce genetic and demographic loss of individual RCWs from the population.

Ecosystem management as outlined in the INRMP, and subordinate plans, including an active prescribed burning program, has enabled the growth and sustainment of the Sandhills East Primary Core Recovery Population and is essential to maintaining this recovery unit. No less important is the protection of high quality, mature pine trees throughout the installation's 105,629-acre ecological habitat matrix, which will be essential to expanding the landscape's capacity to sustain PBGs that may count toward installation recovery goals.

The Action will reduce Fort Bragg's RCW population size from about 461 estimated PBGs to 449 PBGs. This reduction in numbers of PBGs or acreage managed for RCW conservation will not significantly impede the installation's ability to sustain a RCW population meeting recovery criteria and will not significantly diminish the Sandhills RCW population's classification as highly resilient. After reviewing the status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of the RCW.

5. AMERICAN CHAFFSEED

This section provides the Service's biological opinion of the Action for the American chaffseed (*Schwalbea americana*).

5.1. Status of American chaffseed

This section summarizes best available data about the biology and condition of the American chaffseed (*Schwalbea americana*) throughout its range that are relevant to formulating an opinion about the Action. The Service published its decision to list the American chaffseed as endangered on September 29, 1992 (57 FR 44703 44708).

5.1.1. Species Description

American chaffseed is an erect herb with unbranched stems or stems branched only at the base, growing to a height of 3.0 to 6.0 decimeters (12 to 24 inches). The plant is densely albeit minutely hairy throughout, including the flowers. The leaves are alternate, lance-shaped to elliptic, stalkless, 2.5 to 5.0 cm (0.8 to 2 inches) long, and entire; the upper leaves are reduced to narrow bracts. The large, purplish-yellow, tubular flowers, 3.0 to 3.5 cm long (1.2 to 1.4 inches) are borne singly on short stalks in the axils of the uppermost, reduced leaves (bracts) and form a many flowered, spike-like raceme.

The showy flowers have a high degree of bilateral symmetry elaborated for pollination by bees (Pennell 1935). The fruit is a narrow capsule approximately 10 to 12 millimeters (0.4 to 0.5 inches) long, with a septicidal dehiscence. The numerous seeds are pale greenish brown or yellowish-tan, narrowly linear, somewhat flattened or compressed, slightly curved, and enclosed in a loose-fitting, sac-like structure that provides the basis for the common name, chaffseed (Musselman and Mann 1978). Flowering occurs from April to June in the southern part of the species' range, and from June to mid-July in the northern part of its range. Fruits mature from early summer in the South to October in the North (Johnson 1988).

5.1.2. Life History

The following life history description is adapted from the American Chaffseed (*Schwalbea americana*) Recovery Plan (Service 1995)

Parasitism

The root parasitic behavior of American chaffseed has been known since 1856 (Musselman and Mann 1977). As with many Scrophulariaceae, American chaffseed exhibits hemiparasitic behavior. Hemiparasites (also called semiparasites) contain chlorophyll and can produce all or part of their own food, as opposed to holoparasites, which lack chlorophyll and are entirely dependent on host plants for food and water. Haustoria developing from *Schwalbea* roots are unique among Scrophulariaceae parasites in that “a well-developed neck, interrupted zone, a sclerotic layer, and a very broad endophyte are present. Tyloses, which arise from neighboring parenchyma cells and grow through pits in the vessels, are abundant in the neck region” (Musselman and Mann 1977).

American chaffseed is considered the rarest root parasitic plant in the South, and, like most parasitic Scrophulariaceae, it is not host-specific. Musselman and Mann (1977) reported pot-grown American chaffseed had haustorial connections on tulip poplar (*Liriodendron tulipifera*), white pine (*Pinus strobus*), sweetgum (*Liquidambar styraciflua*), black gum (*Nyssa sylvatica*), and tupelo (*Nyssa aquatica*). In the field, haustoria of American chaffseed were found attached to and penetrating inkberry (*Ilex glabra*), dwarf huckleberry (*Gaylussacia dumosa*), and St. John’s-wort (*Hypericum* sp.) (Musselman and Mann 1977). More recently, Kirkman (1993) obtained American chaffseed samples from the field and by clipping the roots of American chaffseed from the stems, observed haustorial connections to colicroot.

Reproduction

Pollinators

American chaffseed produces showy, insect-pollinated flowers with a high degree of zygomorphy elaborated for pollination by bees (Pennell 1935). On Fort Bragg, bumblebees were observed visiting American chaffseed flowers exclusively (The Nature Conservancy 1993), and observations of insect visitation suggest that probable pollinators of American chaffseed are worker bumblebees (*Bombus impatiens* and *B. pennsylvanicus*) Kirkman (1993). These bees were the most commonly observed insects on floral structures and the only species that entered the flowers.

Kirkman (1993) covered American chaffseed flowers with bags to control insect pollination. On the covered flowers, fruit production remained high, suggesting that pollination does not appear to be a requirement for fruit and viable seed production. The flowers are unusual in their color and morphology and deserve more study (L. Musselman, Old Dominion University, *in litt.* 1994).

Germination

The germination rates of collected American chaffseed seeds are high. Kirkman (1993) reported that the germination rate of seeds placed in petri dishes, with and without cold stratification, was approximately 90 percent. Similar high germination rates on several types of media were obtained at the Atlanta Botanical Garden (Kirkman 1993). On the Francis Marion National Forest, similar high germination rates have been observed in greenhouse studies; however, to date, the plants have not grown beyond a small initial stage of approximately 2.0 cm (O. Buckles, U.S. Forest Service, Francis Marion National Forest, Moncks Corner, South Carolina, pers. comm. 1994).

Germination of New Jersey seeds in petri dishes on germination paper was close to 100 percent after a five-month wet cold treatment. Seedlings were transplanted to soil substrates and maintained in a greenhouse under a mist spray to keep the soil continually moist. Seedlings were sown into a series of five soil mixtures differing in soil moisture and water retention capacity. Some seedlings were sown with seeds of little bluestem (*Schizachyrium scoparium*), a potential host species. Seedlings survived for over a month but never grew appreciably larger than 1.0 cm, with 2 to 4 minute leaves. No differences in growth or survival were seen between any of the treatments (T. Hampton *in litt.* 1995).

During field observations, Kirkman and Drew (1995) found that recruitment appears to be associated with microsite soil disturbances such as earthworm casting, pocket gopher activity, and other minor disturbances that expose bare soil. Significant germination has also been observed under thick wiregrass that has fallen over and eliminated other vegetation (L.K. Kirkman, Joseph W. Jones Ecological Research Center, *in litt.* 1994). Examination of American chaffseed roots revealed that, although individual plants are multi-stemmed, they do not vegetatively propagate by rhizomes (Kirkman 1993). Additional information is needed regarding the exact time of year when germination occurs (L.K. Kirkman *in litt.* 1994).

Seed banking

Kirkman (1993) collected soil samples adjacent to American chaffseed plants prior to seed release. Various treatments, including cold treatment and exposure to various soil moisture regimes were used to encourage germination. No individuals of American chaffseed germinated in any of the soil samples. The absence of American chaffseed in the seed bank was unexpected, particularly considering the generalized germination requirements. It is possible that the seeds were too deeply buried in the soil following mixing of the samples for germination, or that the sampling technique was not adequate to obtain seeds in the soil sample (Kirkman 1993). Additional seed banking studies are being considered (L.K. Kirkman pers. comm. 1995).

Seed dispersal

The structure of the American chaffseed seed, somewhat flattened or compressed, slightly curved, and enclosed in a loose-fitting sac-like structure, suggests wind dispersal; however, no information is available to support this hypothesis. Information is lacking on both the mechanism and distance of seed dispersal. Initial observations in New Jersey determined that ants ignored American chaffseed seeds; therefore, ants may be unlikely to function as seed dispersers for this species (T. Hampton *in litt.* 1995).

Population Demography

Kirkman and Drew (1995) report three life stages in the vegetative condition of American chaffseed based on leaf length: small leaves (~ 0.5 cm length), medium leaves (0.5-1 cm), and large leaves (>1.0 cm). First-year seedlings usually have small leaves, and all reproductive plants (plants with fruits and/or flowers) have large leaves. Reproductive individuals are primarily from the previous-year reproductive stage or large-leaf-vegetative stage. Kirkman and Drew (1995) report that more than a third of the reproductive plants in their study remained reproductive the following year and most of those that did not flower remained in the large-leaf vegetative class. Few individuals in the small-leaf-vegetative class became reproductive the next year. Recruits were mostly in the small-leaf-vegetative class; however, a large number of individuals recruited were in the reproductive or the large-leaf-vegetative class, suggesting that plants may have dormant years. Additional demographic analysis of American chaffseed subpopulations regarding spatial patterns of reproduction, recruitment, mortality, survivorship, seed banking, and transitions among age classes is needed to understand critical life stages for management of the species and to estimate the minimum viable population size.

Effects of Fire

As with many pine flatwood and savanna species, American chaffseed may be adapted to a regular fire regime. Historically, lightning-strike fires that occurred throughout American chaffseed range, as well as frequent burning as practiced by indigenous, pre-European human populations, maintained the open woodland/savanna conditions. These fires may have occurred frequently enough that fuel did not accumulate, and the fires were generally of low intensity. Herbaceous species would have been favored over tree and shrub species and would thrive in these conditions. With the general suppression of natural fires in the twentieth century, the ecosystems that American chaffseed inhabits are declining. Without fire, open grass-sedge communities proceed through seral stages and become dominated by trees, shrubs, and dense herbaceous growth that overtop American chaffseed, which appears to be shade intolerant. If fire is suppressed for more than three years, the American chaffseed population declines as other species shade American chaffseed and compete with it for sunlight (D. Rayner, Wofford College, Spartanburg, South Carolina, pers. comm. 1991).

Musselman and Mann (1977) reported that vigorous growth of American chaffseed and abundant seed production were evident after early spring fires at sites in South Carolina. Preliminary results from studies at the Joseph W. Jones Ecological Research Center indicate that American chaffseed has a strong flowering response to dormant- and growing-season burns (Kirkman 1993, Kirkman and Drew 1995). Preliminary analyses of the 1993 population data strongly indicate that fire is a requirement for flower production (Kirkman 1993). In general, dormant-season (March) burns result in May flowering, and growing-season (June) burns result in July or August flowering. The proportion of reproductive individuals is greater in both dormant season and growing season burn treatments compared with that of the control plots (Kirkman and Drew 1995). No differences in mean flower or fruit production per stem were detectable between the dormant season and growing season burns. The highest number of recruits was in dormant season burn treatments.

Observations on the Francis Marion National Forest indicate that American chaffseed plants burned during the growing season will reflower. Porcher (1994) reports that mature American chaffseed plants in flower will immediately resprout after being burned, resulting in seeds falling on a bare, mineral soil in full sunlight, which may be a key factor in the plant's reproductive biology. Observations on Fort Bragg reveal that, following burns (regardless of season), there is an increase in American chaffseed plants the following season. Even on sites where only low herbaceous species occur, American chaffseed occurrences on Fort Bragg decline in the absence of frequent fires, which indicates that competition may not be influencing American chaffseed populations as much as does fire (The Nature Conservancy 1993). Field observations and experimental studies in North Carolina (Porcher 1994) indicate that fire is essential for maintaining American chaffseed. Overall, it appears that American chaffseed responds favorably to dormant season and growing season burns. Additional experimentation is necessary to determine if there are substantial advantages to either of these fire regimes.

The current stronghold for American chaffseed is in the southeastern States where pinelands and savannas on private plantations are managed for bobwhite quail, and on Fort Bragg around the artillery impact areas. Quail management on the private plantations consists of burning, usually in the dormant season before March, to increase and maintain the open, grassy conditions that provide habitat for quail. This management simulates the natural fire frequency of the past and effectively maintains a fire-dependent ecosystem in the Southeast. Similarly, the impact areas on Fort Bragg experience frequent burning due to fires ignited by live-fire training. As a result, a fire-dependent ecosystem that supports American chaffseed is maintained.

Kirkman (1993) reports relatively little flower production in the control and mowed treatments (mowed in June). Similarly, observations from the New Jersey American chaffseed population indicate that when mowing inadvertently took place during the growing season, flowering diminished considerably. In contrast, however, when a single late-season mowing (October-November) was conducted on the New Jersey site, flowering was relatively abundant during the following year. These observations indicate that while fire may be the ideal management tool, mowing (in the dormant season) could be an alternative to fire in instances where burning might not be possible or feasible (T. Gordon *in litt.* 1995). Mowing has certainly been responsible for sustaining the remaining population in New Jersey for the last three or more decades.

5.1.3. Numbers, Reproduction, and Distribution

The following is adapted from the June 27, 2019, American chaffseed (*Schwalbea americana*) 5-Year Review: Summary and Evaluation (Service 2019).

Abundance and trends

When American chaffseed was listed as an endangered species in 1992, 19 extant occurrences were known from the following States: New Jersey (1), North Carolina (1), South Carolina (11), Georgia (4), Florida (1), and Mississippi (1). At the completion of the recovery plan in 1995, extensive searches for this species that occurred in the Southeast, namely North and South Carolina, increased the number of extant occurrences to 72: New Jersey (1), North Carolina (18), South Carolina (42), Georgia (10), and Florida (1). The last comprehensive review of this species status occurred in 2008. At that time, 53 occurrences were extant (30% of sites extant) in 2008:

New Jersey (2), North Carolina (11), South Carolina (33), Georgia (4), Alabama (1), Florida (1), and Louisiana (1). It is important to note that in the 1995 recovery plan and 2008 5-year review, the terms population and occurrence were used interchangeably. Since some American chaffseed populations have multiple element occurrences or sites per population, the number of populations across the species range was over-reported in some cases. In order to standardize population numbers across state boundaries, NatureServe's (2018) population delimitation guidelines were used for all *extant* populations across American chaffseed's range in this 5-year review. Historic and unknown occurrences were not delimited.

Currently, there are 43 extant populations across the species range: Massachusetts (1), New Jersey (2), North Carolina (6), South Carolina (18), Georgia (9), Alabama (2), Florida (3), and Louisiana (2).

State Population Summaries

Alabama

American chaffseed was first collected in Alabama in 1868 by Charles Mohr. His classic 1901 work "Plant Life of Alabama" (1901) mentions American chaffseed and makes reference of its abundance in the state during the 1800s (Schotz 2016, p. 1). At the time of listing, three historic populations were known from Baldwin, Geneva, and Mobile Counties (Service 1995, p. 7). Al Schotz surveyed all three historic populations in 1999. Sites were severely fire suppressed and contained no plants. Thus, they were presumed extirpated (Schotz 2016, p. 1). In June 1999, Alfred Schotz discovered five American chaffseed plants at Splinter Hill Bog, a mosaic of seepage slopes and upland pine woodlands in Baldwin County. This population has not been relocated since its original discovery. The population potentially was destroyed during logging operations (Schotz 2016). Extensive surveys should be done in the future since the site is still managed with fire (Scott Wiggers, Service, pers. comm. 2017). The Enon-Sehoy populations are within a safe harbor agreement for red-cockaded woodpecker. Currently, there are two American chaffseed populations in Bullock County, Alabama. Both occur on the Enon-Sehoy Plantation. Enon-Sehoy Plantation complex includes 25,000 acres of open pine woodland dominated by longleaf, shortleaf, and loblolly pines (Schotz 2016, p. 3). In 2016, the population originally discovered in 2008 by Jeff Glitzenstein, Jason Martin, and Jim Bates, had five colonies with 120 individuals (Schotz 2016, p. 6) and the newly discovered population, 3.8 km south, had 31 plants. Despite the new discovery of a population on Enon-Sehoy Plantation, American chaffseed has declined at this plantation from 2010-2016 from approximately 450 individuals to 120 individuals. Soil disturbance, i.e., roller chopping, may occur at a frequency greater than American chaffseed can tolerate. Conversations with the land manager have taken place and plans to install fencing around the populations are underway. Birmingham Botanical Gardens is safeguarding the Enon-Sehoy Plantation population; 29 American chaffseed plants were recorded in 2018 (J. Glitzenstein, Tall Timbers, pers. comm. 2018).

Connecticut

There are no extant American chaffseed populations in Connecticut. There are two historic occurrences reported in the recovery plan from Middlesex and New London Counties (Service 1995, p.7).

Delaware

Currently, there are no extant occurrences in Delaware (B. McAvoy, Delaware State Division of Fish & Wildlife, pers. comm. 2017). Only one historic population is known from Delaware. The population was destroyed by the widening of the Chesapeake and Delaware Canal, and by agriculture and road development (Service 1995, p. 7). Suitable habitat in the C & D Conservation Area in south-central New Castle County exists (B. McAvoy, Delaware State Division of Fish & Wildlife, pers. comm. 2017). The State of Delaware is interested in reintroducing this species (B. McAvoy, Delaware State Division of Fish & Wildlife, pers. comm. 2017).

Florida

Currently, there are three extant populations in Florida. In 2018, Grace Howell, Land Management Specialist for Alachua Conservation Trust in Florida, discovered one new population in Blackwater River State Forest (BRSF) in Santa Rosa County. This population contains 279 individuals. The other population at BRSF, discovered by Jason Ksepka in 2013, occurs in an ecotone of mature longleaf pine and a very high-quality pitcherplant bog in Okaloosa County. The Okaloosa County population at BRSF occurs near one of the many seepage slopes on the forest in a well-managed RCW tract (Michael Jenkins, Florida Department of Agriculture and Consumer Services, pers. comm. 2016). The BRSF has a ten-year resource management plan that mentions American chaffseed. The BRSF populations occur in areas managed on an average 2-year fire rotation. As more monitoring occurs at BRSF, more/new individuals are recorded. The monitoring protocol includes placing a pin flag near every individual, recording closest plant species, and flower presence/absence, collecting pin flags at the end of survey, and tallying results. When first discovered in 2013, 25 individuals were recorded. In 2017, two new colonies or sections were found, which brought the total population number to 116 individuals. Herbivory from beetles and caterpillars has been noted as an issue/threat (M. Jenkins, Florida Department of Agriculture and Consumer Services, pers. comm. 2017). Herbivores identified by Dave Almquist at the Florida Natural Area Inventory include striped leaf beetle (*Kuschelina* sp.), a *Chromelid* leaf beetle sp., and buckeye caterpillars (*Junonia coenia*). The buckeye caterpillar and striped beetle caused the greatest damage to leaves and plants (M. Jenkins, Florida Department of Agriculture and Consumer Services, pers. comm. 2017). American chaffseed plant associates at BRSF include *Gaylussacia Dumosa* (Southern dwarf huckleberry), *G. frondosa* (dangleberry), *Rhynchospora distans* (narrow-fruited fascicled beaksedge), *S. scoparium* (little bluestem), *Bigelovia nudata* (rayless goldenrod), *Arundinaria tecta* (switch cane), *Sceptridium biternatum* (Southern grapefern), *Eryngium yuccifolium* (rattlesnake-master), *Serenoa repens* (saw palmetto), *Ilex glabra* (gallberry), *Aristida stricta* (wiregrass), *Pinus palustris* (longleaf pine), *Pinguicula* spp. (butterworts), *Drosera* spp. (sundews), *Eriocaulon* spp. (pipeworts), and *Bidens mitis* (Coastal Plain tickseed-sunflower). The third American chaffseed population occurs on Horseshoe Plantation in Leon County. This population occurs on a private plantation that manages intensely for quail and practices techniques such as “harrowing” a field or establishing quail food plots. The harrow breaks up and smooths the soil surface. The American chaffseed population at Horseshoe Plantation is small and has declined throughout the years (J. Glitzstein, Tall Timbers, pers. comm. 2018). In 1994, there were only 12-15 plants and in 2006 only six plants were recorded. Tall Timbers holds a conservation easement for Horseshoe Plantation.

Georgia

There are nine extant American chaffseed populations in Georgia. Four populations occur at the Joseph W. Jones Ecological Center in Baker County. The last survey for the four populations was in 2013. Population numbers were down and each population had fewer than 100 individuals (Lisa Giencke, Joseph W. Jones Ecological Center, pers. comm. 2018). These populations occur in areas managed with fire (average fire return interval 3-5 years) and have Safe Harbor Agreements (SHAs) for red-cockaded woodpeckers. Out of the nine extant Georgia populations, only one occurs on state land-Doerun Pitcherplant Bog population. The Doerun Pitcherplant Bog population appears stable with an average of 80-100 individuals. The Doerun population consists of three colonies. In 2013-2014, there were 82 individuals and in 2007-2008 there were 103 individuals. Four extant populations: Quail Ridge, Arcadia, Freeman Tract, Jefford's Plantation, occur on privately owned quail plantations in Georgia. The Jefford's Plantation population is the only one that does not have any level of protection. Jefford's Plantation contains the largest American chaffseed population (1600-2000 individuals) in Georgia. Quail Ridge and Arcadia both have Tall Timbers Conservation Easements. The Quail Ridge population is highly variable depending on rainfall and fire prescription. For instance, in 2007, a drought occurred and the site had not burned in 3-4 years, and contained only 31 individuals. In contrast, following a burn in 2008, there were 283 individuals (Wilson Baker, Biological Consultant, person. comm. 2017). Arcadia contains nine colonies with approximately 800-1000 individuals. The Freeman Tract population consists of five colonies spread across 600 acres of longleaf pine forest and contains approximately 800 individuals. This site has a SHA but there are no RCW's onsite so the landowner could discontinue the agreement at any time. Landowners may be amendable to a conservation easement (W. Baker, Biological Consultant, pers. comm. 2017).

Kentucky

Two historic records are known from sandstone knobs within the Daniel Boone National Forest located in McCreary County. American chaffseed has not been observed in Kentucky since 1935. An extensive search conducted in 2008 at historic sites yielded no individuals (David Taylor, USFS, pers. comm. 2018). The historic sites are located in areas not easily burned and contain a lot of brushy undergrowth (D. Taylor, USFS, pers. comm. 2018). Historically, in the 1920s, burning was more common, especially in the southern parts of McCreary County, than present day. The woods were burned to allow green up for livestock (D. Taylor, USFS, pers. comm. 2018). An association against prescribe fire formed in Kentucky and was successful in reducing the amount of prescribe fire across the state (D. Taylor, USFS, pers. comm. 2018).

Louisiana

Currently, there are two extant populations, Cow Creek Savannah and CC Road Savannah, in Allen Parish, Louisiana. The Cow Creek Savannah population, first discovered in 2008, had 35 plants, 20 fertile, in 2010 and 13 plants, 12 fertile, in 2017. The population is located within the Calcasieu mitigation bank: <http://calcasieubank.com/>. The mitigation bank is steadily increasing in size (Reid 2017, p. 2) and currently contains 1,486 acres of wet longleaf pine habitat. The site, managed on a 2-year fire return interval, contains some cattle grazing. The CC Road Savannah Preserve American chaffseed population, first discovered in 1996, occurs on pimple mounds or "mima mounds", domelike circle mounds composed of loose soil. Population numbers fluctuate: 2009-1703 plants, 2003-300 plants, and 2001-160 plants (William deGravelles, TNC, pers. comm. 2018). There appears to be a decrease in the number of individuals due to feral hogs and a

longer fire return interval (not burned since June 2015) (deGravelles 2017, p. 1). The population was doing very well with an approximately 2.2 fire return interval. TNC and the Service partnered together to fund a prescribed fire in spring 2018. To reduce threats caused by feral hogs, TNC installed a hog fence around approximately nine acres to encircle the American chaffseed population.

Maryland

The historic status of American chaffseed has not changed since the last 2008 5-year review (Chris Frye, Maryland DNR, pers. comm. 2017). Two historic American chaffseed populations are known in Maryland, one population from Worcester County near Ocean City, and one population from Anne Arundel County.

Massachusetts

In 2018, Massachusetts's botanists discovered a new American chaffseed population in a Sandhill grassland in Barnstable County. This population contains 2631 stems and approximately 500 genets (B. Wehrerehl, pers. comm. 2018). The population occurs in an open area managed by fall mowing. Further, the site appears to have been disturbed or soil moved 20-30 years ago and may have been scraped with a blade/scarified approximately three years ago (B. Wehrerehl, Massachusetts NHP, pers. comm. 2018). The fire history remains unknown, but apparently, there were fires historically in the area (B. Wehrerehl, Massachusetts NHP, pers. comm. 2018). The Town of Barnstable owns the site and are open to future fire management, including prescribed fire and continued mowing. The status of the 10 historic occurrences recorded from Barnstable, Bristol, Dukes, Franklin, Nantucket, Norfolk, Plymouth, and Worcester Counties remains unchanged (Service 1995, p. 9).

Mississippi

The historic status of American chaffseed in Mississippi has not changed since the last 2008 5-year review. Two historic populations are known from Covington and Jackson Counties (Service 1995, p. 9).

New Jersey

Currently, New Jersey has two populations, Whitesbog (natural) and Franklin Parker Roadside population (reintroduced). The Whitesbog population has been relatively stable since annual demographic monitoring began in 1991 but has exhibited steady long-term decline from the peak of 764 individuals observed in 2002. In 2017, the population exhibited a decrease to 83 individuals, down from 111 in 2016 (J. Kelly, RVCC, pers. comm. 2017). Threats to this population include herbivory, succession, and roadside maintenance. The NJDEP Division of Parks and forestry plan to conduct a prescribe burn in 2018 and reduce woody succession by mechanical methods (J. Kelly, RVCC, pers. comm. 2017). The Franklin Parker Roadside reintroduced population contains 26 American chaffseed plants (J. Kelly, RVCC, pers. comm. 2017). Of these plants, 13 flowered in 2017, yielding a total of 202 flowers (J. Kelly, RVCC, pers. comm. 2017).

New York

The historic status of American chaffseed in New York has not changed since the last 2008 5-year review. One historic population is known from Albany County where the species was last observed in 1865 (Service 1995, p. 10).

North Carolina

Currently, there are six extant and eight historic or extirpated populations in North Carolina. All six populations occur on Fort Bragg across Hoke and Cumberland Counties. The Sandhills Game Lands American chaffseed population, extant during the last 2008 5-year review, is now considered historic. This population was small at discovery, with only 35 individuals recorded in 1997. The site was burned on a two-year return interval. Signs of drought stress in 1998 were reported in the NCNHP element occurrence form in addition to two growing season (6-25-97 and 5-98) burns. In 2001, no plants were found and 2005, four plants were recorded. The state game lands population may have declined due to drought stress combined with early growing season burns, i.e., May and June. A reintroduction may be considered for this site.

South Carolina

Currently, there are 18 extant, 11 extirpated or historic, and 10 unknown American chaffseed populations in South Carolina. Six American chaffseed populations (Witherbee Road, Half Way Creek Road, Lethcoe Road, French Quarter Creek, Ballfield (reintroduced), Harleston Dam Road (introduced)) occur on the Francis Marion National Forest. Only two populations, Witherbee Road and Half Way Creek Road, appear stable with greater than 100 individuals consistently recorded per population each year. The Francis Marion National Forest American chaffseed populations are managed on an average 2-3 year fire return interval. Two American chaffseed populations, Lynchburg Savanna Heritage Preserve (HP) and Woods Bay (introduced), occur on state land. Lynchburg Savanna HP, managed with an average 2-year fire return interval and predominately-late growing season fires, contained approximately 200 individuals in 2016. The remaining extant populations occur on private quail plantations in Williamsburg and Jasper Counties. Longlands Plantation has the largest American chaffseed population rangewide, with approximately 8,000 individuals reported in 2016 (J. Glitzenstein, Tall Timbers, pers. comm. 2017). Longlands Plantation has an annual fire prescription and very light or infrequent roller chopping. The plantation, which is enrolled in an SHA, is 18,890 acres and contains 15,000+ acres of RCW habitat. *Lespedeza bicolor* (bicolor lespedeza) occurs across the plantation and poses a low to moderate threat to American chaffseed. "No mechanical equipment" signs posted around several large colonies across the plantation help protect the plant from direct disturbance related to mowing or roller chopping activities. Scotswood Plantation contains approximately 300-400 American chaffseed individuals (J. Glitzenstein, Tall Timbers, pers. comm. 2017). This site has an annual fire prescription and a SHA. Oketee Plantation in Jasper County appears or reportedly has a stable population of American chaffseed due to an annual fire prescription. However, no monitoring has occurred at this population in several years due to lack of access to the site. Although there are 10 unknown American chaffseed populations in South Carolina, there is a high likelihood that many of the populations are either extirpated or historic. Unprotected and unmanaged American chaffseed populations across the species' range generally become extirpated or historic. The South Carolina Botanical Garden is safeguarding the Francis Marion National Forest populations (Witherbee Road and Ballfield populations). Ninety-three plants were reported in 2018 (J. Glitzenstein, Tall Timbers, pers. comm. 2018).

Tennessee

The historic status of American chaffseed in Tennessee has not changed since the last 2008 5-year review. Two historic populations are known from Tennessee with one each in Coffee and Fentress Counties (Service 1995, p. 12).

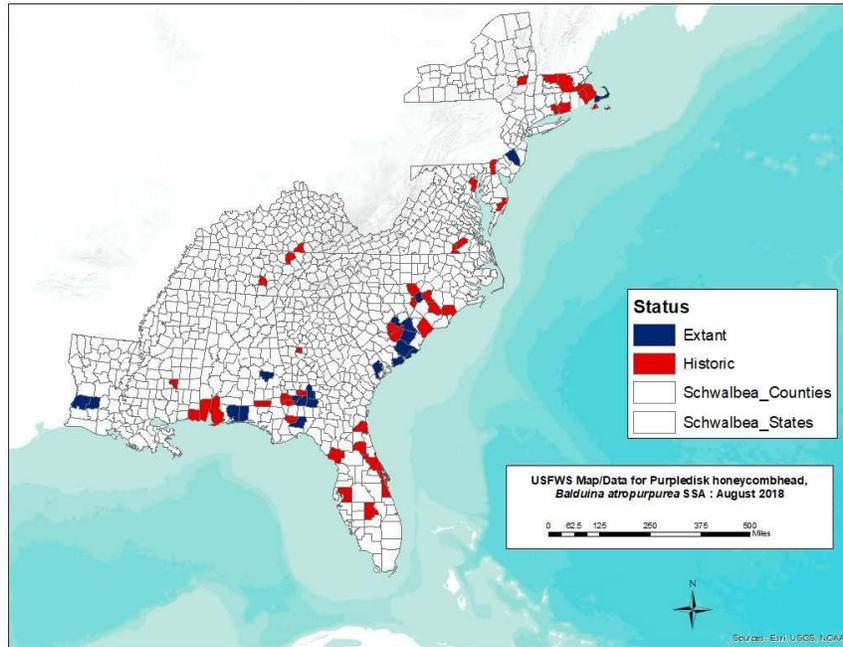
Texas

The historic status of American chaffseed in Texas has not changed since the last 2008 5-year review. One population was reported to occur in east Texas (Service 1995, p. 12). However, no voucher specimens exist in any major Texas herbaria (Texas Parks & Wildlife, 2018).

Virginia

The historic status of American chaffseed has not changed since the last 2008 5-year review. One historic occurrence is recorded from an area between Sussex and Greensville Counties, where the species was last observed in 1937 (Service 1995, p. 13).

Figure adapted from page 22 of the June 27, 2019, American chaffseed (*Schwalbea americana*) 5-Year Review: Summary and Evaluation (Service 2019)



5.1.4. Conservation Needs and Threats

American chaffseed has been and continues to be, endangered by development and by succession of its habitat. Sandy pineland communities where the species exists have proven to be especially vulnerable to development because soils are level, deep, and suitable for building sites. In addition, many American chaffseed populations were or are very near the Atlantic coast where development pressures are high (Rawinski and Cassin 1986). While the demise of many populations can be attributed to direct loss of habitat to development (Rawinski and Cassin 1986, Johnson 1988, The Nature Conservancy 1993), development also presents indirect threats to the species, as urbanization generally results in total fire suppression, which ultimately leads to the loss of the open ecosystems inhabited by American chaffseed.

Threats to the survival of American chaffseed also continue on private and public lands managed for recreation, economic, and other uses. Continuing concerns regarding the species survival on private lands include discontinuation of game management and subsequent cessation of burning resulting in vegetational succession and loss of suitable habitat; conversion of the fire-maintained flatwoods and savannas to commercial pine plantations, which can create dense canopies unsuitable for American chaffseed; and direct destruction of American chaffseed plants due to the placement of firebreaks or the planting of game food plots or other extensive soil disturbances. Potential threats to the species on public lands include inadvertent disturbance to plants and, possibly, commercial pine straw raking. Additionally, prescribed burning of forest tracts, both public and private, is becoming increasingly restricted due to local regulations that prohibit or limit burning to control air pollution. Due to the apparent need for fire to maintain vigorous populations of American chaffseed, reducing prescribed burns where the species occurs would pose a threat to its continued survival.

Occurrences of American chaffseed along roadsides are especially vulnerable to disturbance and loss. Besides succession of habitat, actions such as direct trampling, herbicide application, and road maintenance can adversely affect the plants. In South Carolina, a proposed road widening and improvement project could directly eliminate two small occurrences and indirectly affect others (L. Duncan, U.S. Fish and Wildlife Service, Charleston, South Carolina, pers. comm. 1994).

Another potential threat to the New Jersey population is herbivory. A single white-tailed deer (*Odocoileus virginianus*) herbivory episode in May 1994 severely affected flowering of the population. Most of the American chaffseed plants, which were severed at the base, grew back, often in multiple branches, but did not grow to full size and did not flower (T. Hampton *in litt.* 1995).

According to the recovery plan, *Schwalbea* will be considered for reclassification from endangered to threatened when the following criteria are met:

Condition 1. "Long-term protection is achieved for 50 geographically distinct, self-sustaining populations. The population sites must be protected from development and other anthropogenic threats that may interfere with the species' survival. Protection of populations on private lands

will be secured through landowner agreements or conservation easements. Protection of Schwalbea on public lands will be secured through the development of management plans or other mechanisms that ensure the long-range protection, management, and monitoring of Schwalbea. Protected sites will be distributed to include, at a minimum, all of the states currently supporting Schwalbea, and at least four populations in the northern portion of the species' range. Site protection agreements will cover the immediate occurrence site and, where possible, enough contiguous unoccupied habitat to allow for dispersal, and natural colonization and expansion of the species."

This recovery criterion listed above addresses Listing Factors A (destruction, modification, or curtailment of habitat), D (inadequacy of regulatory mechanisms), and E (other natural or manmade factors). This criterion has not been met. Table 5-1 provides a summary of protected extant populations per State and illustrates the three different levels of protection: (1) Federal or State land, (2) conservation land, conservation easement or mitigation bank, or (3) safe harbor agreements, for each site. Out of the 41 protected *Schwalbea* populations, 20 populations have >100 individuals, 13 of which have over 200 individuals.

Larger populations with >100 individuals have shown greater resiliency, i.e., self-sustaining, in comparison to small populations <100 individuals. To date, 20 populations (protected populations with > 100 individuals, i.e., self-sustaining) meet the recovery criteria listed above. Twenty-six sites have an unknown status with no known surveys conducted in > 10 yrs. Surveys of the 26 unknown *Schwalbea* sites are needed to evaluate whether they are extant and contribute toward achieving this recovery criterion. The majority of sites with an unknown status occur on private lands with limited or no accessibility. There is a low likelihood that these unknown sites remain extant. However, new *Schwalbea* populations are continually being found and additional extensive searches across the species' range in areas with suitable habitat, i.e., managed with fire, could yield new populations that would allow this criterion to be met.

Condition 2. "Management agreements or plans are developed for the 50 protected occurrence sites with the primary objective of ensuring that an ecosystem capable of supporting viable populations of Schwalbea will be permanently maintained. In the case of private ownership, these management agreements could be part of the conservation easement or landowner agreement."

This recovery criterion addresses Listing Factors A (destruction, modification, or curtailment of habitat) and E (other natural or manmade factors). This criterion has not been met. Efforts to achieve this recovery criterion are ongoing. Forty-one populations have some level of protection. Eighteen populations occur on either federal or state land that have formal management plans. Thirteen populations occur on lands protected by conservation easements, occur in mitigation banks, or on conservation lands, (one site in Louisiana occurs on land owned by The Nature Conservancy (TNC)). Ten populations have safe harbor agreements that include enhancement management activities for red-cockaded woodpeckers (RCW) that would maintain the sub-climax habitat required by *Schwalbea*. However, as with Criterion 1 above, surveys are needed for the 26 unknown *Schwalbea* sites to evaluate whether sufficient extant sites remain that would allow for this criterion to be met.

Due to frequent fire requirement (1-2 year fire return interval) that American chaffseed needs to maintain stable to increasing populations, many populations on public land have a trend of decreasing and many have been extirpated. For example, since 1999, the Francis Marion National Forest has lost four American chaffseed populations, including Highway 41, Ballfield, French Quarter Creek, and Cordesville. Three out of nine populations remain on the Francis Marion National Forest, and two are stable (>100 individuals). When reviewing the fire frequency of the extirpated populations and population trends it is clear that American chaffseed declines occurred during periods without fire or when the fire return interval exceeded three years. For example, the extirpated populations mentioned above were burned on a 4-8 year fire return interval.

In New Jersey, the American chaffseed population on State Land is monitored annually and has shown a steady long-term decline from the peak of 764 individuals observed in 2002. In 2017, the population exhibited a decrease to 83 individuals, down from 111 in 2016 (J. Kelly, RVCC, pers. comm. 2017). Threats to this population include herbivory, succession, and roadside maintenance.

Other American chaffseed populations on State and Federal land have displayed similar patterns. For example, the Sandhills State Game Land' American chaffseed population in North Carolina, extant during the last 2008 5-year review, is now considered historical. Another example of American chaffseed declines include the four populations on Joseph W. Jones Ecological Center (Jones Center) in Baker County, Georgia. Although the Jones Center is not State or Federal Land, the center is known for their longleaf restoration and management. Despite their land management practices, American chaffseed populations have declined. The last survey for the four populations was in 2013. Population numbers were down and each population had fewer than 100 individuals (Lisa Giencke, Joseph W. Jones Ecological Center, pers. comm. 2018). These populations occur in areas managed with fire (average fire return interval 3-5 years) and have SHAs for red-cockaded woodpeckers.

American chaffseed populations that appear stable to increasing occur on land that is burned on a 1-2 year fire return interval. Conducting prescribed burns on a 1-2-year fire return interval is difficult to nearly impossible for State and Federal Land managers (e.g., Francis Marion NF is not allowed to conduct burns annually). The majority of stable to increasing American chaffseed populations occur on private quail plantations.

Condition 3. "Viable populations of Schwalbea are established at four sites in the northern portion of the species' range (Massachusetts to Virginia), preferably with genetic material from the only remaining northern population in New Jersey."

This criterion remains relevant; efforts to achieve this recovery criterion are ongoing. Re-establishment of *Schwalbea* within the northern portion of its range has been partially accomplished. One population, Franklin Parker Preserve, was successfully reintroduced at a historic site in Chatsworth, Burlington County, New Jersey. Out of the 42 plants introduced at the Franklin Parker Site (3 colonies), 22 were present and 13 flowered in 2017 (Jay Kelly, Raritan Valley Community College (RVCC), pers. comm. 2018). Seedling recruitment occurred

in 2011 and 2014, and represents an important milestone toward the long-term sustainability of this population. However, viable populations include populations with >100 individuals. As such, the Franklin Parker Site needs augmentation (planting of additional individuals) or management to increase the population number to a sustainable level.

Current plans are underway for two future reintroductions on state land (Atco and Hampton Gate) in Burlington County, New Jersey. *Schwalbea* seed capsules (<5%) were collected from New Jersey's Brendan T. Byrne State Forest and Franklin Parker Preserve reintroduction site to continue *ex situ* (off-site) propagation efforts in 2017. Host plants Maryland golden aster (*Chrysopsis mariana*) and soil were collected from the respective sites where out-planting was to occur. Propagation efforts for future reintroductions are underway at Duke Farms and New Jersey Department of Environmental Protection (NJDEP) Forest Nursery. As of January 2018, 182 seeds germinated at Duke Farms, with 95 exhibiting levels of growth suitable for future reintroductions. At NJDEP Forest Nursery, 268 germinated and survived with 211 being eligible for future out-plantings (J. Kelly, RVCC, pers. comm. 2018). There is interest in reintroducing this species in Delaware (Bill McAvoy, Delaware State Division of Fish & Wildlife, pers. comm. 2017).

The newly discovered *Schwalbea* population in Massachusetts occurs on protected land and contains approximately 2631 stems and 500 genets (genetically distinct individuals) (Bob Wehrerehl, Massachusetts Natural Heritage Program (NHP), pers. comm. 2018). As such, the Massachusetts population helps fulfill the above criterion and brings the total number of northern populations to three: two extant, natural populations and one reintroduced population

Condition 4. "Biennial monitoring shows that 50 protected populations are viable as well as stable or increasing over a 10-year period. Demographic population data will be required to meet this condition."

This criterion remains relevant, but has not been achieved. Less than 50 populations are considered "protected" through either formal or informal agreements. Further, while a few sites are monitored annually or biennially, the majority of sites are not regularly monitored. Only one *Schwalbea* population has demographic population data. From 1993-2017, demographic monitoring data has been collected for the Whitesbog, New Jersey population (J. Kelly, RVCC, pers. comm. 2018). Since 1996, all individuals have been mapped, with spatial coordinates for each plant recorded on a grid system positioned around permanent markers in each colony. Since 1999, aluminum identification tags have been placed at the base of each plant to allow for accurate identification of individuals within the population. Further, since 2001, a second census has been conducted in mid to late September to record new individuals not present during the summer census.

Condition 5. "Life history and ecological requirements are understood sufficiently to reliably predict the effectiveness of protection, management, and monitoring."

This criterion remains relevant. Efforts to achieve this recovery criterion are ongoing

Delisting Criteria

Recovery criteria to delist American chaffseed were not established within the recovery plan. The recovery plan calls for a delisting objective to be defined when research activities identified under recovery plan tasks 4 (investigate the species biology) and 5 (investigate genetic variability) have been completed. Considerable progress has been made under recovery task 4 that would allow for development of delisting criteria.

At one time, *Schwalbea* occurred along the entire Eastern Seaboard (with exception of Maine and New Hampshire) and Gulf Coast, from Massachusetts south to Florida and from Florida west to Texas, and the inland states Kentucky and Tennessee. The status of this species from 1995 to present day has been one of decline. The range of *Schwalbea* has greatly constricted with the species only occurring in eight states along the Eastern seaboard and Gulf Coast. Further, most states only have 2-3 populations and only three states (NC, SC, and GA) contain more than five populations. Threats to this species, habitat destruction/modification and fire suppression, continue along the coast. The high fire frequency (1-2 year fire return interval) required for healthy, self-sustaining populations is hard for land managers to maintain in the Southeast. The remaining stronghold's or reservoirs for *Schwalbea* include Department of Defense Property (Fort Bragg, NC) and quail plantations in South Carolina and Georgia (Table 2). There are 41 protected *Schwalbea* populations, out of these, 20 are self-sustaining. Thus, 30 additional protected, self-sustaining populations are needed to recover the species. *Ex situ* propagation has allowed the reintroduction of 10 populations in the northern and southern portions of the species range. However, none of the reintroduced populations contain >100 individuals. Existing quail plantations in the Southeast, especially in South Carolina, Georgia, Alabama, and Florida, which manage with a fire return interval of 1-2 years, could harbor unknown *Schwalbea* populations. The status of this species could change in the future if private landowners and managers become interested in this species by realizing that the occurrence of *Schwalbea* denotes high quality longleaf flatwood and savanna habitat and that there is no regulatory oversight for plants on private land.

Research needs to be conducted *ex situ* and *in situ* on the germination ecology and recruitment of this species. Although a lot of research has been conducted on the life history and fire response of this species, gaps still remain, including germination ecology, population trends in response to precipitation/drought events, early prescribed growing season fire effects, i.e., April, and late growing season fire effects, i.e., July-August, during times of drought.

Overall, none of the recovery criteria for reclassification have been achieved to date. The continual decline of this species due to habitat destruction and fire suppression continue to threaten this species with extinction throughout a significant portion of its range.

5.1.5. Tables and Figures

Table 5-1: Range-wide summary of extant *Schwalbea americana* (American chaffseed) Populations As reported in the June 27, 2019, American chaffseed (*Schwalbea americana*) 5-Year Review: Summary and Evaluation (Service 2019).

State	Extant Populations	Populations considered protected	Populations on Federal and State Land with a Management Plan	Populations with Conservation Easement or in Mitigation Bank	Populations with Safe Harbor Agreement
Alabama	2	2	0	0	2
Florida	3	3	2	1	0
Georgia	9	8	1	3	4
Louisiana	2	2	0	2	0
Massachusetts	1	1	0	1	0
New Jersey	2*	2	1	1	0
North Carolina	6	6	6	0	0
South Carolina	18*	17	8	5	4
Total	43	41	18	13	10

* The 18 extant populations for South Carolina includes 8 (re)introduced populations and the 2 populations for New Jersey include one reintroduced population.

TABLE 5-2. RANGE-WIDE *SCHWALBEA AMERICANA* (AMERICAN CHAFFSEED) POPULATIONS WITH LONG-TERM PROTECTION AGREEMENTS.

STATE	Site ID	Site Name	Ownership	Year Last Observed	LAST RECORDED POPULATION SIZE
POPULATIONS WITH CURRENT FORMAL LONG-TERM PROTECTION AGREEMENTS					
FL	FL-0011	Blackwater River State Forest	State - Florida Department of Agriculture and Consumer Services	2017	116 PLANTS
FL	FL-0012	Blackwater River State Forest	State - Florida Department of Agriculture and Consumer Services	2018	279 PLANTS
GA	GA---	Doerun Pitcher Plant Bog Natural Area	State - Georgia Department of Natural Resources	?	>100 PLANTS
NJ	NJ-007	Whitesbog, Brendan T. Byrne State Forest	State-New Jersey Department of Environmental Protection, Division of Parks and Forestry	2018	<100 PLANTS
NC	NC-027	Fort Bragg –MacRidge Impact Area	Federal- Department of Defense	2015	>60 STEMS
NC	NC-029	Fort Bragg-(Central Section) Parent EO	Federal-Department of Defense	2008	1000+ PLANTS

NC	NC-030	Fort Bragg-(Central Section) Parent EO	Federal- Department of Defense	2008	>5000 PLANTS
NC	NC-014 & NC-016	Fort Bragg-Black Creek and Rays Mill Creek	Federal- Department of Defense	2017; 1995	250 PLANTS
NC	NC-025	Fort Bragg-Rockfish Creek	Federal- Department of Defense	2017	60 PLANTS
NC	NC-024	Fort Bragg-NWA Training Area AA1	Federal- Department of Defense	2014	2 PLANTS
SC	SC-020	Witherbee Road and Roy's Place	Federal-Francis Marion National Forest	2016	228 PLANTS
SC	SC-069	Half Way Creek Road	Federal-Francis Marion National Forest	2016	920 PLANTS
SC	SC-063	Lethcoe Road	Federal-Francis Marion National Forest	2017	22 PLANTS
SC	SC-007	French Quarter Creek Road	Federal-Francis Marion National Forest	2016	4 ORIGINAL, 7 PLANTED
SC	SC-006	Harleston Dam	Federal-Francis Marion National Forest	2016	25 PLANTS; REINTRO DUCED
SC	SC-018	Ballfield	Federal-Francis Marion National Forest	2018	25 PLANTS; REINTRO DUCED
SC	SC-021, 070	Lynchburg Savanna Heritage Preserve	State-SC Department of Natural Resources	2018	134 PLANTS
SC	SC-	Longleaf Heritage Preserve	State-SC Department of Natural Resources	2015	4 PLANTS, REINTRO DUCED
SC	SC-	Woods Bay Heritage Preserve	State-SC Department of Natural Resources	2018	93 PLANTS; REINTRO DUCED
POPULATIONS WITH SAFE HARBOR AGREEMENT (SHA), CONSERVATION EASEMENTS, OR SOME OTHER FORM OF PROTECTION					
AL	AL-005	Enon and Sehay Plantation	Private; SHA	2016	120 PLANTS
AL	AL---	Enon and Sehay Plantation (Southern colony)	Private; SHA	2016	31 PLANTS
FL	FL-0010	Horseshoe Plantation	Private; Conservation Easement-Tall Timbers	2018	51 PLANTS
GA	GA---	Arcadia Plantation	Private; Conservation Easement-Tall Timbers	2008	800-1000 PLANTS
GA	GA---	Freeman Tract	Private; Safe Harbor Agreement	2008	800 PLANTS
GA	GA---	Ichauway Plantation Macrosite	Private; Joseph W. Jones Ecological Research Center; SHA	1987	10 PLANTS

GA	GA----	Ichauway-Pond 32	Private; Joseph W. Jones Ecological Research Center;SHA	2013	>100 PLANTS
GA	GA---	Ichauway Parmalee	Private; Joseph W. Jones Ecological Research Center;SHA	2013	<100 PLANTS
GA	GA---	Ichauway-Jericho	Private; Joseph W. Jones Ecological Research Center;SHA	2013	<100 PLANTS
GA	GA---	Quail ridge Plantation	Private; Conservation Easement-Tall Timbers	2008	283
LA	LA-001	CC Road Savannahs	The Nature Conservancy	2008	300 PLANTS
LA	LA-002	Cow Creek Savannah	Mitigation Bank	2017	12 PLANTS
MA	MA---	Barnstable	Town of Barnstable Conservation Land Bank	2018	2631 PLANTS
NJ	NJ-020	Franklin Parker Preserve	New Jersey Conservation Foundation	2008	26 PLANTS, REINTRODUCED
SC	SC---	McAlhany Nature Preserve	Charleston Natural History Society	2018	59 PLANTS, REINTRODUCED
SC	SC---	Brumbaker's Property	Private; Conservation Easement	2015	12 PLANTS, REINTRODUCED
SC	SC---	TNC Wambaw	The Nature Conservancy	2015	10 PLANTS, REINTRODUCED
SC	SC---	Porcher's Property	Private; Conservation Easement	2015	3 PLANTS, REINTRODUCED
SC	SC-028, 053, 054	Longlands Plantation 1 -Stony Run and Munn	Private; SHA	2016	3398 PLANTS
SC	SC---	Longlands Plantation 2 - Santee	Private; SHA	2016	62 PLANTS
SC	SC---	Scotswood	Private; SHA	2016	240 PLANTS
SC	SC-011, 019	OKETEE	PRIVATE; SHA	?	>100 PLANTS

5.2. Environmental Baseline for American chaffseed

This section describes the best available data about the condition of the American chaffseed in the Action Area without the consequences caused by the proposed Action.

5.2.1. Action Area Numbers, Reproduction, and Distribution

The BA states that there are 19 extant element occurrences in North Carolina, 17 of which occur on Fort Bragg. Due to the high frequency of fires, the impact areas support large occurrences of American chaffseed. These large occurrences establish Fort Bragg as one of three major population centers along with eastern South Carolina and southwestern Georgia/northwestern Florida. The 17 element occurrences on the installation are distributed on approximately 605.71 acres. Occurrences outside of the impact areas, where burns are less frequent, are limited to five sites with low numbers of individuals. Table 5-3 shows individual plant counts from 2012-2021 for the sites outside of the impact areas where more intense surveys can occur.

The total acreage of five American chaffseed sites summarized in Table 5-3 is 15.51 acres. Historically, of the five sites, SCAM023A produced the highest plant counts over the past 10

growing seasons, and the only site to produce any detectable plants for the past three years. Eight plants were found in the site in 2021.

The affected element occurrence, site ID# SCAM023A is one of five sites outside the impact areas that can be regularly inventoried. Historically, these were burned less frequently and had relatively fewer individuals counted per site than in the impact areas. These five sites represent about 2.5% of the acreage on the installation (605.71 acres total) populated with American chaffseed.

5.2.2. Action Area Conservation Needs and Threats

The installation's American chaffseed populations benefit from the installation's landscape - scale ecosystem management programs. Fort Bragg's ESMC recognizes the importance of fire in maintaining ecological conditions for American chaffseed. In the absence of fire, even if open conditions and low densities of herbaceous species are maintained, occurrences on Fort Bragg decline (Russo et al. 1993). This indicates that frequent fires satisfy life history requirements above and beyond the simple reduction of competition.

The ESMC outlines key monitoring and management goals for tracking condition and conserving the installation's American chaffseed populations.

American Chaffseed Inventory and monitoring

Objective 1. Determine stable populations. If for three consecutive years, the median stem number falls below 40 percent, take management action after consultation with the Service and other pertinent experts. As genetic and demographic information becomes available, modify management to increase populations through clonal recruitment and expansion, sexual reproduction, and genotypic diversification.

Objective 2. On an annual basis, conduct a 100 percent census of five occurrences on Fort Bragg. Use these data to evaluate the effectiveness of the two-year growing season burn cycle for improving the habitat of small, isolated American chaffseed occurrences.

Objective 3. Annually monitor presence/absence of populations in the impact areas.

Objective 4. Mark and GPS new populations in the impact areas.

American Chaffseed Management

Objective 1. Develop and implement habitat prescriptions specific to individual sites.

Objective 2. As genetic and demographic information becomes available, modify management practices to increase populations through clonal recruitment and expansion, sexual reproduction, and genotypic diversification.

Objective 3. Maintain open habitats with growing season prescribed fire on a minimum two- to three-year rotation. In small, localized areas, hand-clear woody vegetation. Use percent canopy cover, BA, and plant vigor measurements as the primary variables to prioritize sites for habitat management.

Objective 4. Protect American chaffseed sites from erosion and siltation impacts through: a) prioritizing endangered species sites that are experiencing siltation impacts for erosion control projects, b) prohibiting mechanized digging within 100 feet of drainages and other water bodies,

and c) monitoring sites for potential siltation impacts and prioritizing sites for preventative measures.

Objective 5. Protect American chaffseed sites from training impacts by marking with yellow diamond-shaped signs. Include a buffer of suitable habitat for future expansion of the population.

Objective 6. Coordinate with the North Carolina Wildlife Resources Commission annually to ensure American chaffseed sites on the Sandhills Game Land are marked.

Objective 7. Conduct project reviews to meet section 7 requirements for potential impacts to American chaffseed. Surveys are valid for five years in proposed project areas in the MCA where no management activity has taken place.

5.2.3. Tables and Figures

TABLE 5-3. FT. BRAGG INDIVIDUAL PLANT COUNTS OF AMERICAN CHAFFSEED (ADAPTED FROM THE DECEMBER 1, 2021 BA)

ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SCAM021A	0	0	0	0	0	0	0	0	0	0
SCAM023A	67	56	59	40	42	23	52	19	12	8
SCAM024A	0	0	0	0	0	0	0	0	0	0
SCAM025A	3	6	4	4	3	1	1	0	0	0
SCAM025B	10	7	5	6	6	0	0	0	0	0
TOTALS	80	69	68	50	51	24	53	19	12	8

5.3. Effects of the Action on American Chaffseed

In a BO for a listed species, the effects of the proposed action are all reasonably certain consequences to the species caused by the action, including the consequences of other activities caused by the action. Activities caused by the action would not occur but for the action. Consequences to species may occur later in time and may occur outside the action area.

We identified and described the activities included in the proposed Action in sections 2.1–2.4 We identified and described other activities caused by the proposed Action in section 2.5. Our analyses of the consequences caused by each of these activities follows.

Range construction is expected to have the greatest potential to result in adverse effects for American chaffseed. Range operation may result in greater fire frequency and have beneficial effects for the species. Range Operation, Avoidance and Minimization, Pine Thinning and Midstory Removal, and Monitoring are not expected to have any adverse effects on American chaffseed and our effects analyses will not further address those activities.

5.3.1. Range Construction

The BA identifies one American chaffseed element occurrence, site ID# SCAM023A that falls within the proposed range clearing limits. SCAM023A is one of five American chaffseed sites that occur outside of the impact areas. Approximately 1.15 acre of the 1.4-acre site falls within the project footprint and would be cleared of trees. Tree removal is necessary to establish line-of-site from firing points to targets that will be located behind the plant site. Grubbing or grading within the plant site will not be required.

Direct effects to American chaffseed include damage to plants from tree harvesting, ground disturbance, and loss of canopy cover. Fort Bragg anticipates that Range construction will result in the destruction of the plants comprising SCAM023A. Density of American chaffseed plants within the site is low. Fort Bragg could not determine how many plants will be lost or damaged as a result of site preparation and construction. The boundaries of the plant site will be posted and designated off limits to foot and vehicular traffic.

5.3.2. Summary

Range construction (site preparation and range construction) will require the removal of trees within 1.15 acre (82%) of a 1.4-acre American chaffseed site that falls within the range clearing limits. Tree removal may result in the loss of some or all plants that comprise the element occurrence (site ID# SCAM023A). Plants that survive range clearing are likely to benefit from frequent wildland fires caused by live fire training in the Action Area.

The affected element occurrence, site ID# SCAM023A is one of five sites outside the impact areas that can be regularly inventoried. Historically, these were burned less frequently and had relatively fewer individuals counted per site than in the impact areas. These five sites represent about 2.5% of the acreage on the installation (605.71 acres total) populated with American chaffseed. The total acreage of these five American chaffseed sites is 15.51 acres. Historically, of the five sites, SCAM023A produced the highest plant counts over the past 10 growing seasons, and the only site to produce any detectable plants for the past three years. Eight plants were found in the site in 2021.

5.3.3. Tables and Figures

5.4. Conclusion for American chaffseed

In this section, we summarize and interpret the findings of the previous sections (status, baseline, effects, and cumulative effects) relative to the purpose of the BO for the American chaffseed, which is to determine whether the Action is likely to jeopardize its continued existence.

Status

The following is adapted from the June 27, 2019, American chaffseed (*Schwalbea americana*) 5-Year Review: Summary and Evaluation (Service 2019). At one time, *Schwalbea* occurred along the entire Eastern Seaboard (with exception of Maine and New Hampshire) and Gulf Coast, from Massachusetts south to Florida and from Florida west to Texas, and the inland states Kentucky and Tennessee. The status of this species from 1995 to present day has been one of decline. The range of *Schwalbea* has greatly constricted with the species only occurring in eight states along the Eastern seaboard and Gulf Coast. Further, most states only have 2-3 populations and only three states (NC, SC, and GA) contain more than five populations.

Threats to this species, habitat destruction/modification and fire suppression, continue along the coast. The high fire frequency (1-2 year fire return interval) required for healthy, self-sustaining

populations is hard for land managers to maintain in the Southeast. The remaining stronghold's or reservoirs for *Schwalbea* include Department of Defense Property (Fort Bragg) and quail plantations in South Carolina and Georgia. There are 41 protected *Schwalbea* populations, out of these, 20 are self-sustaining. Thus, 30 additional protected, self-sustaining populations are needed to recover the species. *Ex situ* propagation has allowed the reintroduction of 10 populations in the northern and southern portions of the species range. However, none of the reintroduced populations contain >100 individuals. Existing quail plantations in the Southeast, especially in South Carolina, Georgia, Alabama, and Florida, which manage with a fire return interval of 1-2 years, could harbor unknown *Schwalbea* populations. The status of this species could change in the future if private landowners and managers become interested in this species by realizing that the occurrence of *Schwalbea* denotes high quality longleaf flatwood and savanna habitat and that there is no regulatory oversight for plants on private land.

Research needs to be conducted *ex situ* and *in situ* on the germination ecology and recruitment of this species. Although a lot of research has been conducted on the life history and fire response of this species, gaps still remain, including germination ecology, population trends in response to precipitation/drought events, early prescribed growing season fire effects, i.e., April, and late growing season fire effects, i.e., July-August, during times of drought.

Overall, none of the recovery criteria for reclassification have been achieved to date. The continual decline of this species due to habitat destruction and fire suppression continue to threaten this species with extinction throughout a significant portion of its range.

Baseline

Out of 19 extant element occurrences in North Carolina, 17 occur on Fort Bragg. Due to the high wildland fire frequency, the impact areas support large occurrences of American chaffseed. The 17 element occurrences on the installation are distributed on approximately 605.71 acres. The ESMC outlines key monitoring and management goals for tracking condition and conserving the installation's American chaffseed populations. The installation's American chaffseed populations has potential to benefit from the installation's landscape-scale ecosystem management programs.

Occurrences outside of the impact areas, where burns are less frequent, are limited to five sites with low numbers of individuals. The affected site, SCAM023A has had the highest plant counts of the five sites over the past 10 years, and the only site to contain any plants for the past three years. These five sites represent only about 2.5% of the total area occupied by American chaffseed on the installation. The majority of element occurrences are believed to be thriving based on frequency of wildland fire within their management areas (the impact areas).

Effects

Range construction is the only part of the Action posing adverse effects to American chaffseed. Felling and skidding all trees in the range clearing will affect 1.15 acres of a 1.4-acre element occurrence. Tree removal may result in the loss of some or all plants that comprise the element

occurrence (site ID# SCAM023A). Plants that survive range clearing are likely to benefit from frequent wildland fires caused by live fire training in the Action Area.

Opinion

The American chaffseed element occurrence adversely affected by the Action (SCAM023A) is one of 17 known to occur on Fort Bragg. The spatial extent of the element occurrence, 1.4 acre, is less than one percent of the total acreage on the installation populated by this species (605.17 acres). Plant count within SCAM023A has declined from a high of 67 individuals in 2012 to eight in 2021. The decline may be due in part to lower fire frequency than other element occurrences that are closer to or within installation impact areas. If American chaffseed can be conserved within the element occurrence location through range clearing the site has potential to benefit from more frequent wildland fire caused by use of the range.

After reviewing the status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of the **AMERICAN CHAFFSEED**.

6. INCIDENTAL TAKE STATEMENT

ESA §9(a)(1) and regulations issued under §4(d) prohibit the take of endangered and threatened fish and wildlife species without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (ESA §3(19)). In regulations, the Service further defines:

- "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering;" (50 CFR §17.3) and
- "incidental take" as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 CFR §402.02).

Under the terms of ESA §7(b)(4) and §7(o)(2), taking that is incidental to a Federal agency action that would not violate ESA §7(a)(2) is not considered prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

This BO evaluated effects of the Action on the endangered American chaffseed (*Schwalbea americana*). ESA §7(b)(4) and §7(o)(2), which provide the authority for issuing an ITS, do not apply to listed plant species. However, ESA §9(a)(2) prohibits certain acts with respect to endangered plant species, including:

- (a) remove and reduce to possession from areas under Federal jurisdiction;
- (b) maliciously damage or destroy on areas under Federal jurisdiction; and
- (c) remove, cut, dig up, or damage or destroy on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.

Regulations issued under ESA §4(d) extend the prohibition under (a) above to threatened plant species (50 CFR §17.71). The damage or destruction of endangered and threatened plants that is incidental to (not the purpose of) an otherwise lawful activity is not prohibited.

For the exemption in ESA §7(o)(2) to apply to the Action considered in this BO, Fort Bragg must undertake the non-discretionary measures described in this ITS, and these measures must become binding conditions of any permit, contract, or grant issued for implementing the Action. Fort Bragg has a continuing duty to regulate the activity covered by this ITS. The protective coverage of §7(o)(2) may lapse if Fort Bragg fails to:

- assume and implement the terms and conditions; or
- require a permittee, contractor, or grantee to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit, contract, or grant document.

In order to monitor the impact of incidental take, Fort Bragg must report the progress of the Action and its impact on the species to the Service as specified in this ITS.

6.1 Amount or Extent of Take

This section specifies the amount or extent of take of listed wildlife species that the Action is reasonably certain to cause, which we estimated in the “Effects of the Action” sections of this BO. The ESA does not prohibit incidental take of listed plants and this incidental take statement does not address effects to American chaffseed. The proposed Action will result in the following forms of take:

- Harvest/ destruction of 1,317.26 acres of occupied, potential good quality foraging habitat will result in loss of about 36 to 40 individual RCWs comprising 11 red-cockaded woodpecker potential breeding groups.
- Removal/ destruction of 159 cavity trees will result in direct loss of about 36 to 40 individual RCWs comprising 12 red-cockaded woodpecker potential breeding groups. Eleven of the 12 PBGs adversely affected by cavity loss are the same PBGs lost as a result of the loss of foraging habitat.
- Up to 20 additional individual RCWs residing in clusters/ territories indirectly affected by the proposed action will be taken as a result of usurpation by RCWs displaced by direct loss of habitat.

The Action will cause the removal and destruction of 1,317.26 acres of occupied, potential good quality RCW foraging habitat (Table 6-1). Of this, 1,216.14 acres will deplete enough foraging habitat to result in the take of 11 PBGs from the NC Sandhills East Primary Core Recovery Population: groups residing in clusters 110, 111, 112, 113, 114, 115, 152, 194, 271, 272, and 603. Residual manageable acreage will be substantially below 75 acres for each of these foraging partitions, as outlined in Appendix 5 of the Recovery Plan (Standard for Managed Stability), and the proportion of original acreage remaining in these partitions will be below 41%.

Table 6-1: Summary of foraging habitat loss for RCW groups eliminated by the Proposed Action

PARTITION #	STATUS	PROJECT AREA	PGQFH PRE-PROJECT ACRES	PROJECT REMOVAL (PGQFH) RANGE & DFL (AC)	% REMOVAL	PGQFH POST-PROJECT ACRES
110	ACT	Range/Direct	68.13	53.93	79.2%	14.2
111	BRE	Range/Direct	108.22	108.22	100.0%	0
112	BRE	Range/Direct	45.92	45.92	100.0%	0
113	BRE	Range/Direct	207.21	205	98.9%	2.21
114	BRE	Range	82.86	82.86	100.0%	0
115	BRE	Range/Direct	153.81	118.44	77.0%	35.37
152	BRE	Range/Direct	121.02	112.24	92.7%	8.78
194	BRE	Range/Direct	157.88	156.81	99.3%	1.07
271	BRE	Range	143.62	103.56	72.1%	40.06
272	BRE	Range	233.11	165.94	71.2%	67.17
603*	BRE*	Range/Direct	105.72	63.22	59.8%	42.5
		Total Acres:	1427.5	1216.14		211.36

Based on average group size for PBGs in the Action Area, take of up to 40 individual RCWs from 12 active clusters will occur as a result of the loss of foraging habitat due to site preparation and range clearing and initial live fire training.

Cavity tree removal will result in almost immediate loss of individual birds. Not all cavities in a cluster currently serve as roost trees. Some have been enlarged and/or may be occupied by other species. RCWs will occupy the cavities that are in the best condition among the cavities in trees comprising their cluster. Loss of these individual birds will be sustained as impacts of the Action eliminate cavity trees, which provide shelter for each RCW. The BA identifies 159 cavity trees that will be cut, destroyed or significantly damaged as a result of the Action.

Table 6-2: Summary of RCW clusters losing cavity trees as a result of the Proposed Action

CLUSTER NUMBER	STATUS	TOTAL NUMBER OF CAVITY TREES	NUMBER OF CAVITY TREES CUT – RANGE CLEARING	NUMBER OF CAVITY TREES DESTROYED – LIVE FIRE	NUMBER OF CAVITY TREES DESTROYED-DISPERSION	PROPORTION REMOVED
110	ACT	19	0	19	0	100%
111	BRE	17	17	0	0	100%
112	BRE	5	0	5	0	100%
113	BRE	12	0	12	0	100%
114	BRE	16	16	0	0	100%
115	BRE	17	13	3	0	82.4%
149	BRE	16	0	0	2	6.3%
152	BRE	9	9	0	0	100%
194	BRE	13	1	12	0	100%
251	BRE	12	11	0	0	100%
271	BRE	15	15	0	0	100%
272	BRE	9	9	0	0	100%
452	BRE	13	0	0	1	7.7%
603	BRE	9	0	8	1	88.9%
2500	No Mgmt	N/A	0	4	1	N/A
TOTAL		182	91	63	5	

Table 6-3: Summary of Effects of the Action on Active Clusters/ PBGs within the Range and Live Fire Area

CLUSTER/PARTITION #	STATUS	PROJECT AREA	PROPORTION PGQFH LOST	PROPORTION CAVITY TREES LOST	PBG LOST DUE TO FORAGING LOSS	PBG LOST DUE TO CAVITY TREE LOSS
110	ACT	Range/Direct	79%	100%	X	X
111	BRE	Range/Direct	100%	100%	X	X
112	BRE	Range/Direct	100%	100%	X	X
113	BRE	Range/Direct	98.9%	100%	X	X
114	BRE	Range	100%	100%	X	X
115	BRE	Range/Direct	77%	76.4%	X	X
152	BRE	Range/Direct	92.7%	100%	X	X
194	BRE	Range/Direct	99.3%	100%	X	X
251	BRE	Range	22.1%	100%		X
271	BRE	Range	72.1%	100%	X	X
272	BRE	Range	71.2%	100%	X	X
603*	BRE*	Range/Direct	59.8%	100%	X	X

*Breeding season 2021 data

As a result of displaced RCWs from within the Action Area venturing into the neighborhood analysis area (3.7-mile radius of habitat loss in the Action Area), between 18 and 20 RCWs indirectly affected by the Action may be taken as a result of intra-specific competition for available cavities. We estimate that up to 20 individual RCWs, either directly affected by habitat loss or usurped from their cavities by displaced RCWs will be taken by predators, succumb to the elements, be killed by another RCW or other cavity-dependent species or otherwise lost from the population.

6.2 Reasonable and Prudent Measures

The Service believes the reasonable and prudent measures (RPMs) we describe in this section for the RCW are necessary or appropriate to minimize the impact, *i.e.*, the amount or extent, of incidental take caused by the Action.

RPM #1. Develop and coordinate a cluster management plan to minimize loss of RCWs from clusters directly affected by range construction. The Installation has accounted for anticipated adverse effects to RCWs upon the removal of impacted cluster cavity trees. Fort Bragg proposes cavity provisioning to conserve RCWs affected by cavity tree removal; however, there is no documentation regarding the details of minimizing or reducing the impacts to resident birds occupying the impacted clusters. Use the Standard for Managed Stability (e.g., minimum territory size of 75 acres; Service 2003) to assess habitat assigned to RCW breeding groups adjacent to directly involved breeding groups and identify where habitat might be shared. Identify suitable sites where artificial cavities can be provisioned in a way that allows for groups taken by range clearing to find roosting and share residual habitat. Share the cluster management plan with the Service prior to implementation.

RPM #2. Minimize/Avoid impacts to red-cockaded woodpecker breeding groups during the breeding season (April – July). Where timing of tree clearing for range construction extends into the red-cockaded woodpecker breeding season, prohibit any tree removal within active red-cockaded woodpecker clusters still present and within a 0.25-mile radius of red-cockaded woodpecker breeding groups with limited foraging resources.

RPM #3 Develop a cluster management plan to minimize loss of RCWs from clusters that will be subject to heavy downrange impacts. The Installation has accounted for anticipated adverse effects to RCWs as a result of cavity tree loss caused by live-fire training. The installation proposes cavity provisioning to conserve RCWs affected by loss of cavity trees; however, there are few details describing how Fort Bragg plans to minimize or reduce impacts to resident birds occupying the affected clusters. Use the Standard for Managed Stability (e.g., minimum territory size of 75 acres; Service 2003) to assess foraging and cavity provisioning habitat assigned to RCW breeding groups adjacent to directly involved breeding groups and identify where artificial cavities can be provisioned in a way that allows for groups taken by live-fire training activities to find roosting and share residual habitat. Share the cluster management plan with the Service prior to implementation, and provide updates to the cluster management plan as the plan is adapted to account for changes to habitat loss due to impacts of live fire training in the DFL.

6.3 Terms and Conditions Measures

In order for the exemption from the take prohibitions of §9(a)(1) and of regulations issued under §4(d) of the ESA to apply to the Action, Fort Bragg must comply with the terms and conditions (T&Cs) of this statement, provided below, which carry out the RPMs described in the previous section. These T&Cs are mandatory. As necessary and appropriate to fulfill this responsibility, Fort Bragg must require any permittee, contractor, or grantee to implement these T&Cs through enforceable terms that Fort Bragg includes in the permit, contract, or grant document.

T&C #1 (RPM #1). Develop and coordinate a cluster management plan to minimize loss of RCWs from clusters directly affected by range construction. The cluster management plan shall include a timeline (projection) for when timber and cavity tree removals would occur. Fort Bragg's cluster management plan will outline the sequence in which clusters will be cut and identify where projected replacement clusters will be located. Artificial cavities will be provisioned at least four weeks ahead of the time projected for when active cavity trees in the construction area will be screened for removal.

T&C #2 (RPM #2). Minimize/Avoid impacts to red-cockaded woodpecker breeding groups during the breeding season (April – July). RCW breeding groups are sensitive to disturbance within the cluster during the breeding season. In addition to having a suitable nest cavity, each adult requires a cavity for roosting. Sufficient habitat needs to be available to a breeding group to sustain group members and to provision nestlings/fledglings. At the onset of breeding season (prior to April 1), review status of RCW groups in/adjacent to the construction area. Identify any extant habitat within the construction area that: (a) falls within a cluster or (b) falls within 0.25-mile of a breeding group that has less than 75 acres of available foraging habitat.

T&C #3 (RPM #3). Develop a cluster management plan to minimize loss of RCWs from clusters that will be subject to heavy downrange impacts. The Installation shall develop a cluster management plan to direct migration of down-range RCW clusters away from discrete areas where their foraging and nesting habitat will receive the most live fire impacts. Use the Standard for Managed Stability (e.g., minimum territory size of 75 acres; Service 2003) to assess habitat assigned to RCW breeding groups adjacent to directly involved breeding groups and identify where habitat might be shared. Identify suitable sites where artificial cavities can be provisioned in a way that allows for groups losing habitat as a result of live-fire training to find roosting and sharable residual habitat.

Some proportion of currently occupied RCW habitat may remain present downrange throughout the operation of the range. It's possible that one or two RCW breeding groups displaced by range construction may continue to use downrange habitat for as long as it exists. A cluster management plan developed under T&C # 3 may also consider conservation of RCW breeding groups that were maintained within the conservation landscape as a result of implementing RPM #1.

6.4 Monitoring and Reporting Requirements

In order to monitor the impacts of incidental take, Fort Bragg must report the progress of the Action and its impact on the species to the Service as specified in the ITS (50 CFR §402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting (M&R), including procedures for handling and disposing of any individuals of a species actually killed or injured. These M&R requirements are mandatory. We identify whether Fort Bragg, the Applicant, or both are responsible.

As necessary and appropriate to fulfill this responsibility, Fort Bragg must require any permittee, contractor, or grantee to accomplish the M&R through enforceable terms that Fort Bragg includes in the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify Fort Bragg and the Service if the amount or extent of incidental take specified in this ITS is exceeded during Action implementation.

M&R #1 Summary of Monitoring Results

A report summarizing the results of the monitoring implemented as a part of the Action (see Section 2.5 Monitoring) must be submitted to the Service's Raleigh Ecological Services Field Office by March 31 of the following year to the above-listed address. The report will include the following:

- (a) Number of active completed cavities in each monitored cluster
- (b) Nest tree locations in each cluster
- (c) List of color-banded adults comprising each RCW group, including sex, age and banding dates
- (d) Number of eggs, hatchlings and fledglings produced in each cluster
- (e) List of young-of-year RCWs that fledge, including sex and band information.
- (f) Description of biologically relevant observations, e.g., inter- or intraspecific conflicts, observations of banded RCWs from clusters/territories adversely affected by the Action, etc.

In addition to the above listed information, the report should also summarize impacts to cavity trees seriously damaged or destroyed by live fire training.

M&R #2 Track loss of active, completed cavities during range construction and addition of provisioned cavities drilled/inserted for minimization

For each **active** cavity tree removed for site preparation and range construction, at the time cavities are screened (see section 2.3 Avoidance and Minimization) record:

- (a) Cluster number
- (b) tree identification number
- (c) date
- (d) geographic coordinates
- (e) and cavity height and direction for each **active** cavity.

For each artificial cavity provisioned for conservation of PBGs adversely affected by the proposed Action (see section 2.3 Avoidance and Minimization) record:

- (a) Cluster number
- (b) tree identification number
- (c) date provisioned
- (d) geographic coordinates
- (e) cavity height and direction

These data may be recorded in spreadsheet form or included as an attribute table for a shape file or ESRI Geodatabase.

The monitoring report and spreadsheet (with geographic coordinates) or shape file with attributes for M&R #s 1 and 2 should be submitted by January 31 of the following year to the Service's Raleigh Ecological Services Field Office:

Raleigh Field Office
U.S. Fish and Wildlife Service
Post Office Box 33726
Raleigh, North Carolina 27636-3726
(919) 856-4520

Upon locating a dead, injured, or sick individual of an endangered or threatened species, initial notification must be made to the Service's Law Enforcement Office below. Additional notification must be made to the Service's Ecological Services Field Office identified above and to the NCWRC at (252) 241-7367. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

Jason Keith
U.S. Fish and Wildlife Service
551-F Pylon Drive
Raleigh, NC 27606
919-856-4786, extension 34

7. CONSERVATION RECOMMENDATIONS

§7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid or minimize the adverse effects of a proposed action, implement recovery plans, or develop information that is useful for the conservation of listed species. The Service offers the following recommendations that are relevant to the listed species addressed in this BO and that we believe are consistent with the authorities of Fort Bragg:

- To conserve vital genetic and demographic resources, develop and implement a translocation plan for young of the year (juvenile) RCWs produced by groups subject to incidental take as a result of the Action. The translocation plan would be developed in coordination with the Service. The plan may prioritize placement of post-fledging birds

with unpaired RCWs with suitable territories or into recruitment clusters within the NC Sandhills population. Similar translocations have been successful in re-establishing breeding groups within the Sandhills. Translocations into other populations or to establish new populations may also be considered.

- A significant number of RCW territories on Fort Bragg are densely aggregated such that foraging habitat apportioned to each cluster by Thiessen polygons is less than 75 acres in size (i.e., below Standard for Managed Stability acreage). Many are below recommended Recovery Standard acreage. Some work has been done to evaluate space sharing in RCWs (Garabedian et al. 2018). Conduct research to better understand population dynamics where territories are densely aggregated and how to conserve this population in the face of adverse habitat change.
- Expand monitoring for potential group level effects to territories outside of the 1.25-mile radius of the effects footprint and into the neighborhood analysis area (3.7-mile dispersal range). Examine for effects of emigrating birds displacing existing members of existing groups, filling breeding vacancies, etc.
- Conduct pre- and post-Action group composition checks in all (or as many) accessible active clusters in the analysis neighborhood (3.7-mile radius around the area of adverse effects) as practicable. Following initial range clearing, conduct morning follows and roost checks for RCWs that were displaced by habitat loss.
- For RCW groups that cannot be completely conserved through cluster management, identify the roosting cavities of breeding and helper males that will be adversely affected by the Action and find trees/ provision cavities to shelter these RCWs adjacent to their previous cluster locations.

8. REINITIATION NOTICE

Formal consultation for the Action considered in this BO is concluded. Reinitiating consultation is required if Fort Bragg retains discretionary involvement or control over the Action (or is authorized by law) when:

- a. the amount or extent of incidental take is exceeded;
- b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this BO;
- c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
- d. a new species is listed or critical habitat designated that the Action may affect.

In instances where the amount or extent of incidental take is exceeded, Fort Bragg is required to immediately request a reinitiation of formal consultation.

9. LITERATURE CITED

- Baker, W.W. 1995. The distribution and status of the red-cockaded woodpecker (*Picoides borealis*) in Georgia, 1992. Pages 465-469 in D.L. Kulhavy, R.G. Hooper, and R. Costa, editors. Red-cockaded woodpecker: recovery, ecology and management. Center for applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA.
- Barron, M., T. Marston, J. Neufeldt, and R. Costa. 2015. Red-Cockaded Woodpecker (*Picoides borealis*) Endangered Species Management Component, Fort Benning, Georgia.
- Bowman, R., D.L. Leonard Jr., L.K. Backus, P.M. Barber, A.R. Mains, L.M. Richman, and D. Swan. 1998. Demography and habitat characteristics of the red-cockaded woodpecker (*Picoides borealis*) at the Avon Park Air Force Range. Final Report 1994-1998. Archbold Biological Station, Lake Placid, Florida, USA.
- Bruggeman, D. J. and M. Jones 2014. Development of adaptive management tools to guide habitat allocations for at-risk species. Final Report, SERDP Project RC-1656. Strategic Environmental Research and Development Program, Arlington, Virginia, USA.
- Butler, M. J. 2001. Red-cockaded woodpecker foraging habitat requirements on industrial forests in southern Arkansas and northern Louisiana. Thesis, University of Arkansas at Monticello, Monticello, Arkansas, USA.
- Cely, J. E., and D.P. Ferral. 1995. Status and distribution of the red-cockaded woodpecker in South Carolina. Pages 470-476 in D.L. Kulhavy, R.G. Hooper, and R. Costa, editors. Red-cockaded woodpecker: recovery, ecology and management. Center for applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA.
- Conner, R. N., and K. A. O'Halloran. 1987. Cavity-tree selection by red-cockaded woodpeckers as related to growth dynamics of southern pines. *Wilson Bulletin* 99:398-412.
- Conner, R.N. and D.C. Rudolph. 1991. Forest habitat loss, fragmentation, and red-cockaded woodpeckers. *Wilson Bulletin* 103:446-457.
- Conner, R.N., D.C. Rudolph, and J.R. Walters. 2001. The red-cockaded woodpecker: surviving in a fire-maintained ecosystem. University of Texas Press, Austin, Texas, USA.
- Conner, R. N., D. C. Rudolph, R. R. Schaefer, D. Saenz, and C. E. Shackelford. 1999. Relationships among red-cockaded woodpecker group density, nestling provisioning rates, and habitat. *Wilson Bulletin* 111:494-498.
- Convery, K. M., and J. R. Walters. 2004. Red-cockaded woodpecker home range and foraging partitions. Pages 526-535 in R. Costa, and S. J. Daniels, editors. Red-cockaded woodpecker: road to recovery. Hancock House, Blaine, WA.

- Costa, R. C. 2013. Number of active clusters required to achieve PBG population goal. Fort Benning ESMC Material: White Paper. RCWO LLC, Mountain Rest, South Carolina.
- Costa, R. and R.S. Delotelle. 2006. Reintroduction of fauna to longleaf pine ecosystems: opportunities and challenges. Pages 335-376 in S. Jose. E.J. Jokela and D.L. Miller, editors. The longleaf pine ecosystem: ecology, silviculture, and restoration. Springer Science + Business Media, Inc., New York, USA.
- Costa, R. and R. Escano. 1989. Red-cockaded woodpecker: status and management in the southern region in 1986. U.S. Forest Service Technical Publication R8-TP 12.
- Crowder, L. B., J. A. Priddy, and J. R. Walters. 1998. Demographic isolation of red-cockaded woodpecker groups: a model analysis. Project Final Report, prepared for U.S. Fish and Wildlife Service.
- Daniels, S.J. and J.R. Walters. 2000. Inbreeding depression and its effects on natal dispersal in red-cockaded woodpeckers. *The Condor* 102:482-491.
- deGravelles, W. 2017. American chaffseed 5-year review questionnaire. The Nature Conservancy of Louisiana. Breaux Bridge, LA. 6 pp.
- DeLotelle, R.S. and R.J. Epting. 1992. Reproduction of the red-cockaded woodpecker in central Florida. *Wilson Bulletin* 104:285-294.
- Fort Bragg. 2021. Biological Assessment for the Construction and Operation of the Multipurpose Training Range (MPTR) at Fort Bragg Military Installation, North Carolina.
- Fort Bragg. 2018. Integrated Natural Resources Management Plan 2019 – 2023, Fort Bragg and Camp Mackall, North Carolina. Directorate of Public Works, Environmental Division, Fort Bragg, North Carolina.
- Fort Bragg. 2008. Endangered Species Management Component: 2008 through 2013. Directorate of Public Works, Environmental Sustainment Division, Conservation Branch, Fort Bragg, NC.
- Fort Bragg. 2001. Integrated Natural Resources Management Plan: 2001 through 2005. Directorate of Public Works, Environmental Sustainment Division, Conservation Branch, Fort Bragg, NC.
- Garabedian, J. E., C. E. Moorman, M. N. Peterson, and J. C. Kilgo. 2018. Evaluating interactions between space-use sharing and defence under increasing density conditions for the group-territorial red-cockaded woodpecker (*Leuconotopicus borealis*). *Ibis*: early view January 3, 2018.

- Hanula, J.L., and K.E. Franzreb. 1998. Source, distribution, and abundance of macroarthropods on the bark of longleaf pine: potential prey of the red-cockaded woodpecker. *Forest Ecology and Management* 102:89-102.
- Hardesty, J.L. R.J. Smith, C.J. Petrick, B.W. Hagedorn, and F.P. Percival. 1995. Status and distribution of the red-cockaded woodpecker in South Carolina. Pages 494-502 in D.L. Kulhavy, R.G. Hooper, and R. Costa, editors. *Red-cockaded woodpecker: recovery, ecology and management*. Center for applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA,
- Hooper, R. G. 1983. Colony formation by red-cockaded woodpeckers: hypotheses and management implications. Pp. 72-77 in D. A. Wood, ed. *Red-cockaded woodpecker symposium II*. Florida Game and Fresh Water Fish Commission, Tallahassee, FL.
- Hooper, R.G. 1996. Arthropod biomass in winter and the age of longleaf pines. *Forest Ecology and Management*. 52:392-398.
- Hooper, R. G. and M. R. Lennartz. 1995. Short-term response of a high density red-cockaded woodpecker population to loss of foraging habitat. Pp. 283-289 in D. L. Kulhavy, R. G. Hooper, and R. Costa, eds. *Red-cockaded woodpecker: recovery, ecology and management*. Center for Applied Studies in Forestry, Stephen F. Austin State University, Nacogdoches, TX.
- Hooper, R.G., L.J. Niles, R.F. Harlow, and G.W. Wood. 1982. Home ranges of red-cockaded woodpeckers in coastal South Carolina. *Auk* 99:675-682.
- James, F. C. 1995. The status of the red-cockaded woodpecker in 1990 and the prospect of recovery. Pages 439-451 in D.L. Kulhavy, R.G. Hooper, and R. Costa, editors. *Red-cockaded woodpecker: recovery, ecology and management*. Center for applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA.
- James, F.C., C.H. Hess, and B.C. Kicklighter. 2001. Ecosystem management and the niche gestalt of the red-cockaded woodpecker in longleaf pine forests. *Ecological Applications* 11 :854-870.
- Johnson, R.T., 1988. The Nature Conservancy element stewardship abstract on *Schwalbea americana* L. (Draft). The Nature Conservancy, Arlington, Virginia.
- Kesler, D. C., J. R. Walters, and J. J. Kappes. 2010. Social influences on dispersal and the fat-tailed dispersal distribution in red-cockaded woodpeckers. *Behavioral Ecology* 21:1337-1343.
- Kirkman, L.K. and M. Drew 1995. Progress report for life history and experimental management of *Schwalbea americana* (1994). Unpublished report submitted to the U.S. Fish and Wildlife Service. Joseph W. Jones Ecological Research Center, Newton, Georgia.

- Kirkman, L.K. 1993. Progress report for life history, seed banks and experimental management of *Schwalbea americana*. Unpublished report submitted to the U.S. Fish and Wildlife Service. Joseph W. Jones Ecological Research Center, Newton, Georgia. 9 pp.
- Lennartz, M. R., R. G. Hooper, and R. F. Harlow. 1987. Sociality and cooperative breeding of red-cockaded woodpeckers (*Picooides borealis*). Behavioural Ecology and Sociobiology 20:77-88.
- Ligon, J.D., P.B., Stacey, R.N. Conner, C.E. Bock, and C.S. Adkisson. 1986. Report of the American Ornithologists; Union Committee for the conservation of the red-cockaded woodpecker. Auk 103:848-855.
- Ligon, J.D., W.W. Baker, R.N. Conner, L.A. Jackson, F.C. James, D.C. Rudolph, and J.R. Walters. 1991. The conservation crisis- the red-cockaded woodpecker: on the road to oblivion? Auk 108:200-213.
- Ligon, J.D. 1970. Behavior and feeding biology of the red-cockaded woodpecker. Auk 87:255-278.
- Martin, T. E. 1995. Avian life history evolution in relation to nest sites, nest predation, and food. Ecological Monographs 65:101-127.
- Martin, T. E., and P. Li. 1992. Life history traits of open vs. cavity-nesting birds. Ecology 73:579-592.
- Masters, R. E., J. E. Skeen, and J. Whitehead. 1995. Preliminary fire history of McCurtain County Wilderness Area and implications for red-cockaded woodpecker management. Pages 290 - 302 in D.L. Kulhavy, R.G. Hooper, and R. Costa, editors. Red-cockaded woodpecker: recovery, ecology and management. Center for applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA.
- Mohr, C. 1901. Plant Life of Alabama. Vol. VI: Contr. U.S. Nat. Herb. U.S. Department of Agriculture Division of Botany, Washington, D.C. 921 pp.
- Moody, A., N. Haddad, W. F. Morris, and J. Walters. 2011. Mapping habitat connectivity for multiple rare, threatened, and endangered species on and around military installations. Final Report, SERDP Project RC-1471. Strategic Environmental Research and Development Program, Arlington, Virginia, USA.
- Musselman, L.J. and W.F. Mann. 1977. Parasitism and haustorial structure of *Schwalbea americana* (Scrophulariaceae). Beitr. Biol. Pflanzen (Contributions to the Biology of Plants) 53: 309-315.
- Pasinelli, G. and J. R. Walters. 2002. Social and environmental factors affect natal dispersal and philopatry of male Red-cockaded Woodpeckers. Ecology 83:2229-2239.

- Pasinelli, G., K. Schiegg, and J. Walters. 2004. Genetic and environmental influences on natal dispersal distance in a resident bird species. *The American Naturalist* 164:660-669.
- Pennell, F.W. 1935. The Scrophulariaceae of eastern temperate North America. *The Academy of Natural Sciences of Philadelphia: monographs* 1:482-487.
- Porcher, R.D. 1994. Final Report: Transplant study of pondberry (*Lindera melissifolia*) and monitoring study of American chaffseed (*Schwalbea americana*). Unpublished report provided to the U.S. Fish and Wildlife Service. South Carolina Heritage Trust Program, Columbia, South Carolina. 46 pp.
- Rawinski, T. and J. Cassin. 1986. Final status survey reports for 32 plants. Unpublished report to U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. Eastern Heritage Task Force of The Nature Conservancy, Boston, Massachusetts.
- Reed, J.M. and J.R. Walters. 1996. Helper effects on variance components of fitness in the cooperatively breeding red-cockaded woodpecker. *Auk* 113:608-616.
- Reid, C. 2017. American chaffseed 5-year review questionnaire. Louisiana Department of Wildlife & Fisheries. Baton Rouge, LA. 3 pp.
- Ricklefs, R. E. 1969. An analysis of nesting mortality in birds. *Smithsonian Contributions to Zoology* 9:1-48.
- Rudolph, D.C., H. Kyle, and R.N. Conner. 1990. Red-cockaded woodpeckers vs. rat snakes: the effectiveness of the resin barrier. *Wilson Bulletin* 102:14-22.
- Russo, M.J., B.A. Sorrie, B. VanEerden, and P.E. Hippensteel. 1993. Rare and Endangered Plant Survey and Natural Area Inventory for Fort Bragg and Camp Mackall Military Reservations, North Carolina. The Nature Conservancy, Carrboro, NC, and North Carolina Natural Heritage.
- Program. DoD Contract M67004-91-D-0010, XVIII Airborne Corps and Fort Bragg, Fort Bragg, NC.
- Schotz, A. 2016. Status update of *Schwalbea americana*, American chaffseed, on the Enon and Sehoy Plantations, Alabama. Final Report. Unpublished. Alabama Natural Heritage Program, Auburn University, AL.
- Shaffer, M. L. 1981. Minimum population sizes for species conservation. *Bioscience* 31:131-134.
- Shaffer, M. L. 1987. Minimum viable populations: coping with uncertainty. Pages 69-86 in Soule, editor. *Viable populations for conservation*. University Press, Cambridge, United Kingdom.

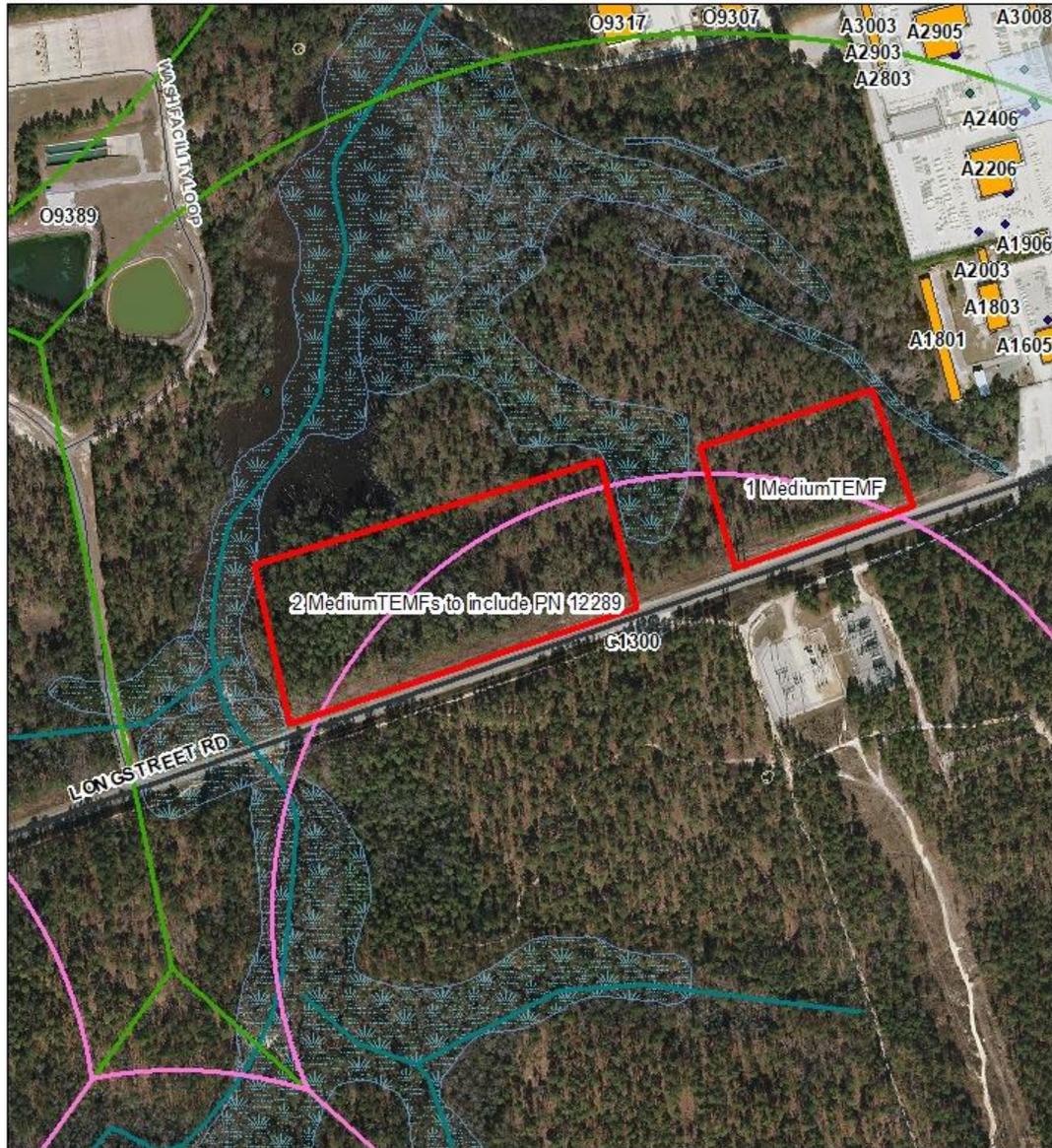
- Schiegg, K., G. Pasinelli, J.R. Walters, and S. J. Daniels. 2002. Inbreeding and experience affect response to climate change by endangered woodpeckers. *Proceedings of the Royal Society Biological Sciences* 269:1153-1159.
- Trainor, A. M., J. R. Walters, W. F. Morris, J. Sexton, and A. Moody. 2013. Empirical estimation of dispersal resistance surfaces: a case study of red-cockaded woodpeckers. *Landscape Ecology* 28:755-767.
- The Nature Conservancy. 1993. Element stewardship abstract on *Schwalbea americana*. Unpublished report. Sandhills Field Office, The Nature Conservancy, Southern Pines, North Carolina.
- U.S. Army. 2007a. Management guidelines for the red-cockaded woodpecker on Army installations. U.S. Department of the Army, Washington, D.C., USA.
- U.S. Army Corps of Engineers. 2008. Final Biological Assessment for Proposed Maneuver Center of Excellence Actions at Fort Benning, Georgia. U.S. Army Corps of Engineers, Mobile District. Post Office Box 2288, Mobile, Alabama 36628.
- U.S. Fish and Wildlife Service. 2020. Species Status Assessment Report For the Red-cockaded woodpecker (*Picoides borealis*) Version 1.3. 198 pp.
- U.S. Fish and Wildlife Service. 2019. American chaffseed (*Schwalbea americana*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Southeast Region. South Carolina Ecological Service's Field Office. Charleston, South Carolina.
- U.S. Fish and Wildlife Service. 2016. USFWS Species Status Assessment Framework: an integrated analytical framework for conservation. Version 3.4 dated August 2016.
- U.S. Fish and Wildlife Service. 2005. Memo from Walsh. 4 May 2005. Implementation procedures for use of foraging habitat guidelines and analysis of project impacts under the red-cockaded woodpecker (*Picoides borealis*) Recovery plan: second revision.
- U.S. Fish and Wildlife Service. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. U.S. Fish and Wildlife Service, Atlanta, GA.
- U.S. Fish and Wildlife Service. 1995. American Chaffseed (*Schwalbea americana*) Recovery Plan. U.S. Department of the Interior, U.S. Fish and Wildlife Service. Hadley, MA. 38 pp + Appendices.
- U.S. Fish and Wildlife Service. 1992. Biological Opinion for the proposed construction of the Installation Materials and Maintenance Division Complex on Fort Bragg, U.S. Fish and Wildlife Service, Atlanta, GA. 24pp.
- Walters, J.R., P. Baldassarro, K.M.Convery, R. McGregor, L.B. Crowder, J.A. Priddy, D.C. Kessler, S.A. Tweddale. 2011. A Decision Support System for Identifying and Ranking Critical Habitat Parcels On and In the Vicinity of Department of Defense Installations.

Strategic Environmental Research and Development Program, Project RC-I472,
Arlington, Y4,pp.214.

- Walters, J.R. 2005a. Assessment of Proposed Spring Lake Rezoning on the Sandhills Red -
cockaded Woodpecker Population. Unpublished report.
- Walters J.R., B.Simmons, C. Nycum, R. Meekins. 2005b. The biology and management of the
redcockaded woodpecker on Marine Base Camp Lejeune, NC: Progress toward recovery
under the new management plan. Department of Biology, Virginia Tech University,
Blacksburg, VA.
- Walters J.R., K. Sadler., S. J. Daniels., J.H. Carter., K.Scheigg., G. Pasinelli., and P.D. Doerr.
2004. Demographic Connections Within the Sandhills Red-cockaded Woodpecker
Population. Project Final Report (Draft)
- Walters, J.R., L.B. Crowder, and J.A. Priddy. 2002. Population viability analysis for red-
cockaded woodpeckers using an individual-based model. *Ecological Applications*
12:249-260.
- Walters, J. R., S. J. Daniels, J. H. Carter, III, P. D. Doerr, K. Brust, and J. M. Mitchell. 2000.
Foraging habitat resources, preferences and fitness of red-cockaded woodpeckers in the
North Carolina sandhills. Fort Bragg Project Final Report. Virginia Polytechnic Institute
and State University, Blacksburg, VA, and North Carolina State University, Raleigh, NC.
- Walters, J. R., P. D. Doerr, and J. H. Carter III. 1992. Delayed dispersal and reproduction as a
life history tactic in cooperative breeders: fitness calculations from red-cockaded
woodpeckers. *American Naturalist* 139:623-643.
- Walters, J.R. 1990. Red-cockaded woodpeckers: a 'primitive' cooperation breeder. Pp. 69-101 *in*
P.B. Stacey and W.D. Koenig, eds. *Cooperative breeding in birds*. Cambridge University
Press, London, UK.
- Walters, J.R., P.D. Doerr, and J.H. Carter III. 1988. The cooperative breeding system of the red-
cockaded woodpecker. *Ethology* 78:275-305. Personal Communications
- Personal Communications
- Baker, W. 2018. Biological Consultant. Telephone records of November 2017. Tallahassee, FL.
- deGravelles, W. 2018. Land Steward. Email record of February 17, 2018. The Nature
Conservancy of Louisiana. Breaux Bridge, LA.
- Dellinger, B. 2017. Wildlife Technician. Email record of July 24, 2017. U.S. Forest Service,
Francis Marion National Forest. Berkeley County, SC.

- Frye, Christopher. 2017. State Botanist. Email record of August 18, 2017. Maryland Department of Natural Resources Wildlife and Heritage Service. Wye Mills, MD.
- Giencke, L. 2018. Plant Ecology Research Associate. Email of February 19, 2018. Joseph W. Jones Ecological Research Center. Newton, GA.
- Glitzenstein, J. 2017. Botanical Consultant. Telephone record of November 2017. Tall Timbers, Tallahassee, FL.
- Glitzenstein, J. 2018. Botanical Consultant. Email of April 20, 2018. Tall Timbers, Tallahassee, FL.
- Jenkins, M. 2016. Plant Conservation Biologist. Email of April 6, 2016 and July 7, 2017. Florida Department of Agriculture and Consumer Services, Florida Forest Service, Tallahassee, FL.
- Jenkins, M. 2017. Plant Conservation Biologist. Email of July 7, 2017. Florida Department of Agriculture and Consumer Services, Florida Forest Service, Tallahassee, FL.
- Kelly, J. 2017. Professor. Emails of February 14 and 15, 2018. Raritan Valley Community College. Branchburg, NJ.
- Kelly, J. 2018. Professor. Emails of February 14 and 15, 2018. Raritan Valley Community College. Branchburg, NJ.
- McAvoy, B. 2017. Botanist. Email of October 16, 2017. Delaware Department of Natural Resources and Environmental Control, Wildlife Species Conservation & Research Program. Dover, DE.
- Taylor, D. 2017. Botanist. Telephone record of November 2017. U.S. Forest Service, Winchester, KY.
- Wernerehl, B. 2017. Botanist. Email of April 5, 2018. Massachusetts Natural Heritage & Endangered Species Program. Westboro, MA.
- Wernerehl, B. 2018. Botanist. Email of July 24, 2018. Massachusetts Natural Heritage & Endangered Species Program. Westboro, MA.
- Wiggers, M.S. 2017. Botanist. Email of October 16, 2017. U.S. Fish and Wildlife Service. Moss Point, MS.

Proposed TEMFs



475 237.5 0 475 Feet



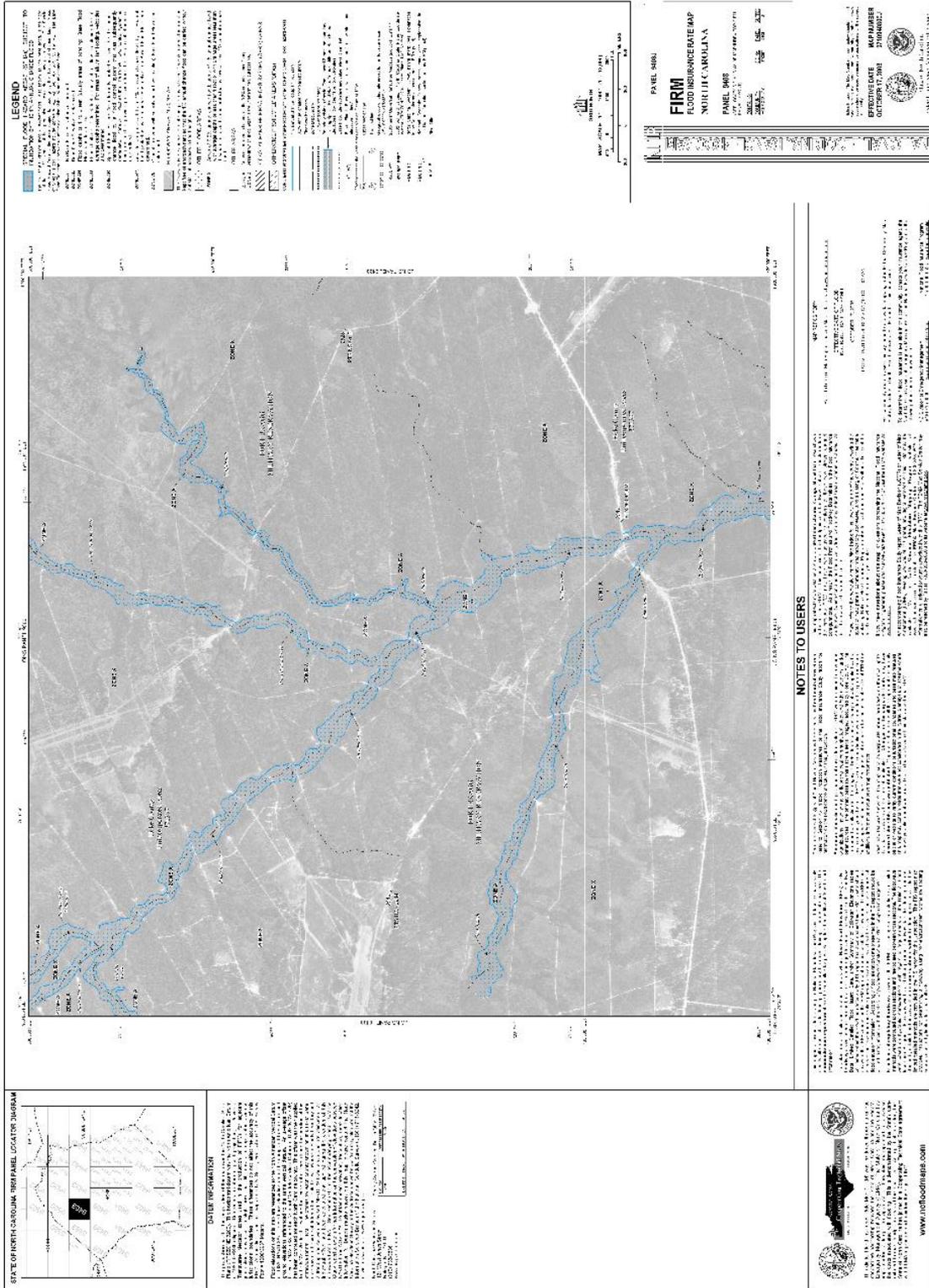
Legend

- WaterFeature_L
- Wetland
- RCW_QUARTER_MILE_PARTITION
- RCW_HALF_MILE_PARTITION

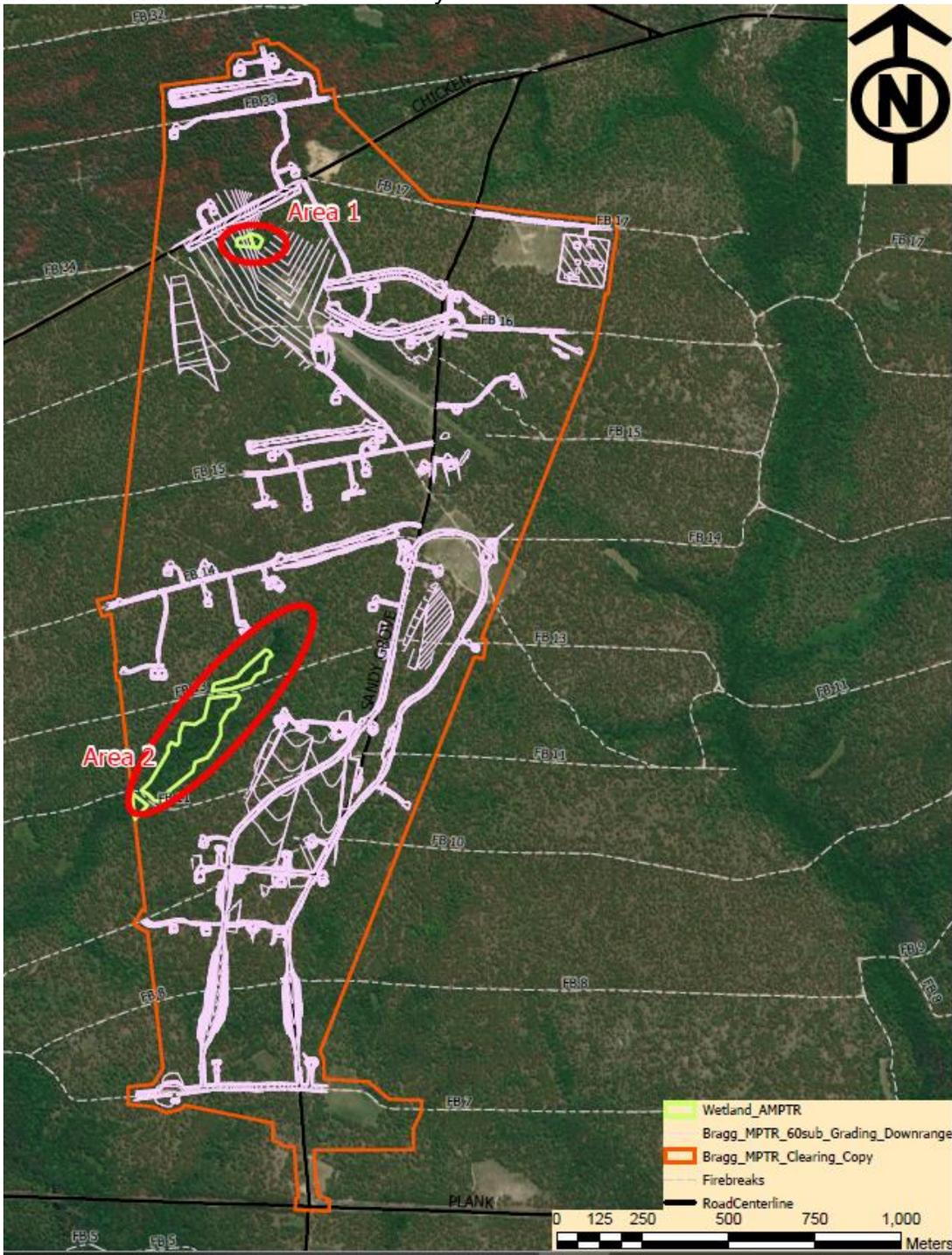
Proposed TEMF Construction



Northwest project area



Inclusion Y: MPTR Wetland Overlay



Inclusion Z: TEMF FEMA Map



POWERED BY **esri**
Esri, USDA Farm Service Agency

20.2 Cross Sections with 1% Annual Chance Water Surface Elevation

17.5 Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

Channel, Culvert, or Storm Sewer

Levee, Dike, or Floodwall

OTHER FEATURES

GENERAL STRUCTURES

Without Base Flood Elevation (BFE)

With BFE or Depth

Regulatory Floodway, Zone AE, AO, AH, VE, AR

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile, Zone X

Future Conditions 1% Annual Chance Flood Hazard, Zone X

Area with Reduced Flood Risk due to Levee, See Notes, Zone X

Area with Flood Risk due to Levee, Zone D

SPECIAL FLOOD HAZARD AREAS

OTHER AREAS OF FLOOD HAZARD

Approximate location based on user input and does not represent an authoritative property location

Selected Floodmap Boundary

Digital Data Available

No Digital Data Available

Unmapped

Area of Minimal Flood Hazard, Zone X

Effective LOMs

Area of Undetermined Flood Hazard, Zone D

Otherwise Protected Area

Coastal Barrier Resources System Area

PIN

MAP PANELS

OTHER AREAS

Inclusion AA: Draft Finding of No Practicable Alternative



DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BRAGG
2175 REILLY ROAD, STOP A
FORT BRAGG NORTH CAROLINA 28310-5000

DRAFT FINDING OF NO PRACTICABLE ALTERNATIVE for the CONSTRUCTION AND OPERATION OF A MULTIPURPOSE TRAINING RANGE AND FIELDING THE MOBILE PROTECTED FIREPOWER VEHICLE at FORT BRAGG, NORTH CAROLINA

1. Introduction. Fort Bragg is a 163,000 acre Army installation, located in south-central North Carolina. Approximately 146,000 acres are dedicated to training lands. The proposed action would construct and operate a multipurpose training range (MPTR; Project Number 96182) with Mobile Protected Firepower (MPF) vehicle capability. The MPF is capable of firing large caliber rounds following gunnery standard for the mobile gun system. The proposed action is slated for construction and operation in the western training area portion of Fort Bragg. No existing Fort Bragg range can support MPF firing and training requirements. Fort Bragg is deficient of mounted gunnery ranges, and requires a mounted gunnery range allowing long-distance firing for training and qualification according to an 8-9 October 2019 planning charrette lead by the Department of the Army (DA) Combined Arms Center.

Fort Bragg contains approximately 10,900 acres of wetlands. Wetlands have unique and important biological functions. They provide critical habitat for many wildlife species, absorb and abate floodwaters, improve water quality by removing pollutants, affect groundwater discharge and recharge, stabilize sediments, abate stormwater, and enhance aesthetics. The proposed action will fill and grade 0.3 acre of an isolated wetland and remove all trees within an 8.8 acre wetland.

2. Notice of Wetland Impact. Federal agencies will consider alternative actions and modify those actions to the extent feasible to avoid adverse wetland effects or potential harm pursuant to Executive Order (EO) 11990. The EO 11990 requires federal agencies to avoid development within wetlands to the maximum extent possible when there is a practicable alternative. Additionally, EO 11990 requires federal agencies to provide an opportunity for early public review of plans or proposals for new construction in wetlands. The Army used alternative screening analysis, and determined the proposed action at the preferred location necessitates development within the wetlands as described. The preferred location was specifically chosen to reduce the degree of wetland impacts compared to alternative sites considered.

The Finding of No Practicable Alternative (FONPA) will be made available to state and federal agencies (through the North Carolina Department of Administration) and the public for a 30-day public review. Similarly the corresponding environmental assessment (EA) and draft mitigated finding of no significant impact (FNSI) will be made available to state and federal agencies (through the North Carolina Department of Administration) and the public for a 30-day review at:

Cumberland County Library, 300 Maiden Lane, Fayetteville, NC 28301.
John L. Throckmorton Library, Building 1-3346, Randolph Street, Fort Bragg, NC 28310.

Hoke County Public Library, 334 N. Main Street, Raeford, NC 28376

Moore County Library, 101 Saunders Street, Carthage, NC 28327

Written comments and questions about the FONPA, EA and draft FNSI and its analyses may be directed to:

Ms. Ginny Carswell, NEPA Coordinator, United States Army Installation Management Command, Headquarters, United States Army Garrison, Fort Bragg, 2175 Reilly Road, Stop A, Fort Bragg, North Carolina (NC) 28310. Ms. Carswell is also available for questions regarding the EA, draft FNSI and FONPA by phone at (910) 396-9888 and by email at virginia.l.carswell.civ@army.mil.

3. Proposed Action. The MPTR construction would begin in FY2023. The proposed MPTR is specifically designed to satisfy the training and qualification requirements for the crews, teams, and sections of combat units. This range would support dismounted infantry squad tactical live-fire operations, either independently of, or simultaneously with supporting vehicles. The range would be utilized to train and test armor, infantry, and aviation teams, crews, and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets would be fully automated, and the event specific target scenario would be computerized and operated from an on-site control tower. Captured audio/video would be compiled and available to the unit at the after action review (AAR).

Primary facilities include a 578 square foot (sf) control tower, one 1,800 sf operations facility, port- a-john pads with three-sided wind walls, a 726 sf bleacher enclosure, 800 sf covered mess, 1,064 sf instrumented range AAR building, 450 sf ammunition loading dock, six bivouac pads (15 by 25- feet each), and unit storage. The range would consist of six moving ammunition targets, 30 stationary targets and berms, four moving infantry targets, 122 stationary infantry targets, ten battle positions, five urban facades, one urban cluster consisting of seven buildings, one helicopter tactical landing area, four camera towers and two machine gun bunkers. The project would require utilities to include: storm drainage; fencing; paving; electricity; and communications. Potable water will be trucked on site and a portable toilet contract will provide wastewater services. Additional construction would include a 17,000 linear foot (lf) by 20 foot (ft.)-wide tank trail; 35,000 lf by eight ft.-wide maintenance trail; site clearing and grading; fencing; and gravel parking area. Range road construction will be 20-feet wide and road construction within the administrative facility section used for control and administrative reasons (range operations control area) will be 24-feet wide. The entire range will be cleared of vegetation (816 acres) and approximately 20% of the range will be grubbed (160 acres).

4.0 Description of Alternatives. Five potentially suitable alternatives were identified for the proposed actions and evaluated. Four of the alternatives (Alternatives 2-5) analyzed construction within wetlands associated with Rockfish Creek. The alternatives are as follows:

4.1 Alternative 1: No Action Alternative: The No Action Alternative would not construct and operate a MPRT range, and not equip the Infantry Brigade Combat Teams (IBCT) with the MPF. This alternative does not meet the purpose and need; however, the Council of Environmental Quality and Army NEPA regulations require consideration and analysis of the No Action Alternative to provide a baseline against which the other alternatives may be compared.

4.2 Alternative 2: Construct and operate a range south of McPherson Impact Area with MPF gunnery capability and the facilities described in Section 3.0 to include: connecting to electrical and communication utilities approximately 13,000 lf from the site; and direct-burying 13,000 lf of fiber optic cable lines from an existing communication node along Plank and Raeford Vass Roads to the proposed project area. The lines would be bored underneath the wetland feature spanning Plank Road. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range surface danger zone (SDZ) would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Construction would start north of Plank Road at Firebreak 7 expanding north in order to avoid demolition of Sandy Grove Church and the associated cemetery. The newly expanded portion of McPherson Impact Area would be non-dudded. See Enclosure 1.

4.3 Alternative 3: Construct and operate a range south of McPherson Impact Area without MPF gunnery capability and the facilities described in Section 3.0 to include: connecting to electrical and communication utilities approximately 13,000 lf from the site; and direct-burying 13,000 lf of fiber optic cable lines from an existing communication node along Plank and Raeford Vass Roads to the proposed project area. The lines would be bored underneath the wetland feature spanning Plank Road. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range SDZ would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Construction would start north of Plank Road at Firebreak 7 expanding north. The newly expanded portion of McPherson Impact Area would be non-dudded. Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. See Enclosure 1.

4.4 Alternative 4: Construct and operate a range southwest of McPherson Impact Area with MPF capability (starting at Plank Road) and the facilities described in Section 3.0 to include: connecting to electrical and direct-burying fiber optic cable lines from an existing communication node along Plank Road to the proposed project area. The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of

McPherson Impact Area would be non-dudded. The proposed project would intersect a major tributary of Rockfish Creek; the construction and full range operation would impact a portion of these designated wetlands. See Enclosure 2.

4.5 Alternative 5: Construct and operate a range southwest of McPherson Impact Area without MPF capability (starting at Plank Road) and the facilities described in Section 3.0 to include: connecting to electrical utilities approximately and direct-burying fiber optic cable lines from an existing communication node along Plank Road to the proposed project area. The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudded. Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed project would intersect a major tributary of Rockfish Creek; the project would remove vegetation, construct within, and fully operate within designated wetlands. See Enclosure 2.

Full analysis of all socioeconomic and environmental impacts to include wetlands were analyzed in the corresponding environmental assessment. Constructing a MPTR range without the MPF would not satisfy current DA capability requirements, therefore, Alternatives 3 and 5 were eliminated from consideration. Additionally, Alternatives 4 and 5 would impact approximately 98.79 acres of wetlands and 20,733 linear feet of stream compared to Alternative 2 which would impact 9.1 acres of wetlands and therefore eliminated from consideration. Alternatives 1-2 were carried forward for full analysis in the EA. The preferred alternative is Alternative 2 – *Construct and Operate a Range South of McPherson Impact Area North of Firebreak 7 with MPF Gunnery Capability*. This is the only alternative that will fully satisfy the purpose and need for the mission.

5. Anticipated Wetland Impacts. The analysis in the EA found non-significant impacts to socioeconomic and environmental impacts to include wetlands. A 0.3 acre isolated wetland located within the northern project footprint will be graded and filled resulting from the proposed action. Isolated wetlands are non-jurisdictional wetlands with no “significant nexus” or connection with traditional waters of the United States, and are not regulated under Section 404 of the Clean Water Act. Tree removal is required within an 8.8 acre wetland occurring in the southern portion of the project footprint; this wetland area will not be filled or graded and all other vegetation will remain. Supporting electrical and communication lines will be directionally bored where Juniper Creek crosses Plank Road. The United States Army Corps of Engineers (USACE) has no jurisdiction over isolated wetlands; therefore, permitting and mitigation are not required for the associated grading and fill of the 0.3 acre isolated wetland. Similarly, USACE does not require permitting and mitigation to convert a forested to a non-forested wetland. The State of North Carolina issued a State General Permit for Impacts to Isolated and Other Non-404-Jurisdictional Wetlands and Surface Waters Permit (number IWGP100000) to fill and grade the 0.3 acre isolated wetland. Forested wetland to non-forested wetland conversion does not require permitting by the North Carolina Department of

Environmental Quality (NCDEQ) because grading and grubbing will not occur within this 8.8 acre wetland. Best Management Practices will be implemented to minimize wetland impacts within the 8.8 wetland forested to non-forested conversion area. Plans will be developed per criteria in the NCDEQ Erosion and Sediment Control Planning and Design Manual for erosion control, and Department of Water Quality Best Management Practices Manual for post construction Stormwater Management. State stormwater applications will provide an applicable soils report with the associated Seasonal High Water Table as well as a map of the boring locations within the footprint of the stormwater control measure. Development and redevelopment exceeding one acre requires water quality treatment for the first inch of rainfall (Session Law 2006-246). In addition, Section 438 of the Energy Independence and Security Act (EISA) of 2007 requires development and redevelopment projects exceeding 5,000 square feet to maintain or restore predevelopment hydrology (including temperature, rate, volume, and duration of flow) to the maximum extent technically feasible. The Environmental Protection Agency has issued guidance that on-site management of the total volume of rainfall from the 95th percentile storm addresses Section 438 of EISA. The 95th percentile rain event is equal to 1.8 inches of rainfall for this locality. To comply with Section 438 of EISA, a variety of low-impact development methods, such as reducing impervious areas, porous pavements, infiltration basins, vegetated swales, and bio-retention, will be incorporated into the development to attain the goal of having 100 percent of stormwater retained on-site.

The NCDEQ mandates that a State Individual Post-Construction Stormwater Permit will be submitted and approved before construction. The overall design objective is to maintain or restore pre-development hydrology and prevent any net increase in stormwater runoff. Adherence to these laws and regulations will result in a non-significant impact to water resources due to additional stormwater runoff. See Enclosure 3.

6. Conclusion. The Army has determined the Preferred Alternative is Alternative 2; no other practicable alternatives exists to avoid development within a wetland.

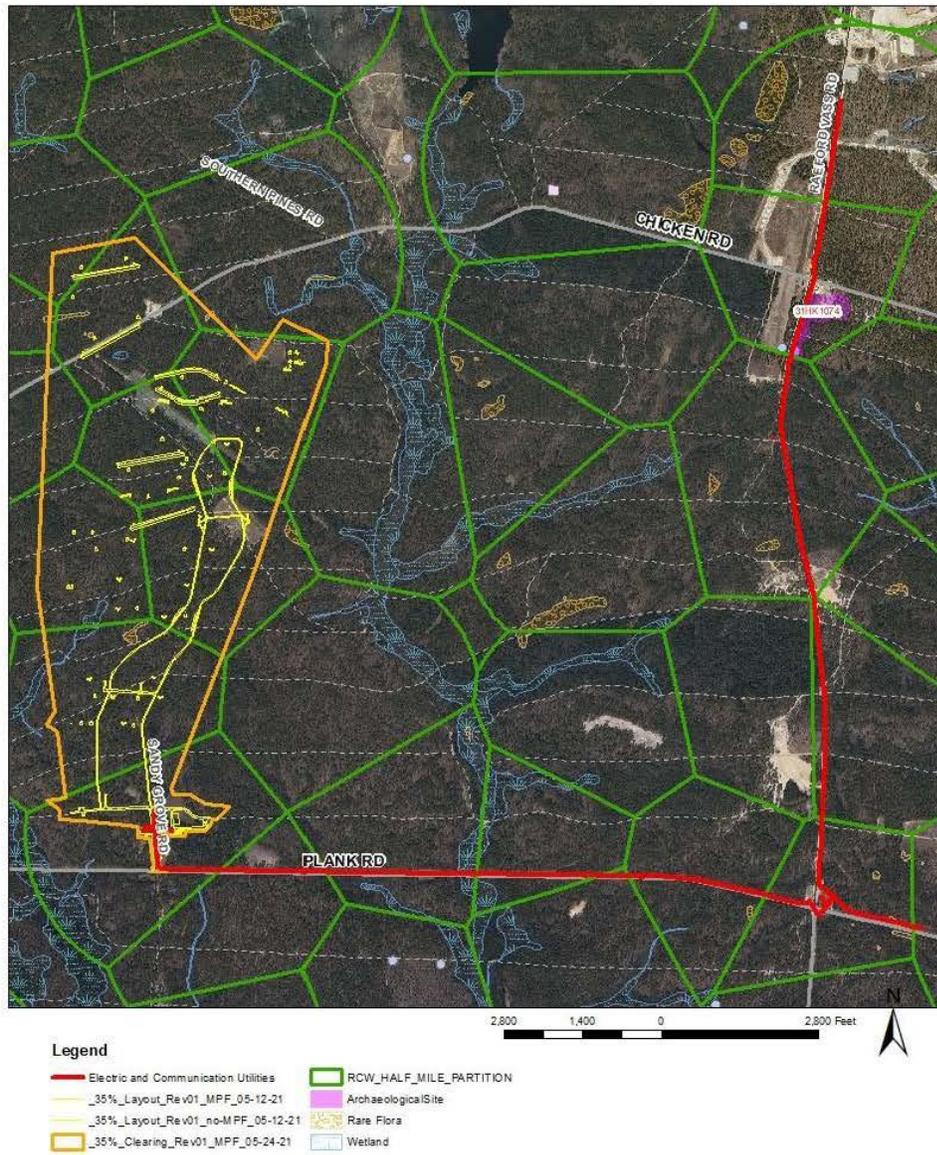
After evaluating demolition and construction plans satisfying the purpose and need for Proposed Action, I determined there are no other practicable alternatives exists to site the Proposed Action entirely outside of wetlands. The Army will implement BMPs to minimize wetland impacts and are incorporated into the Proposed Action.

Date

Ms. Carla K. Coulson
Deputy Assistant Secretary of
the Army Installations,
Housing & Partnerships

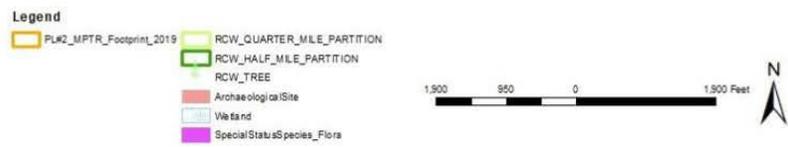
3 Encls

Enclosure 1. Location of Preferred Alternative with Communication and Electric (60% and 35% Design) with Environmental Layers

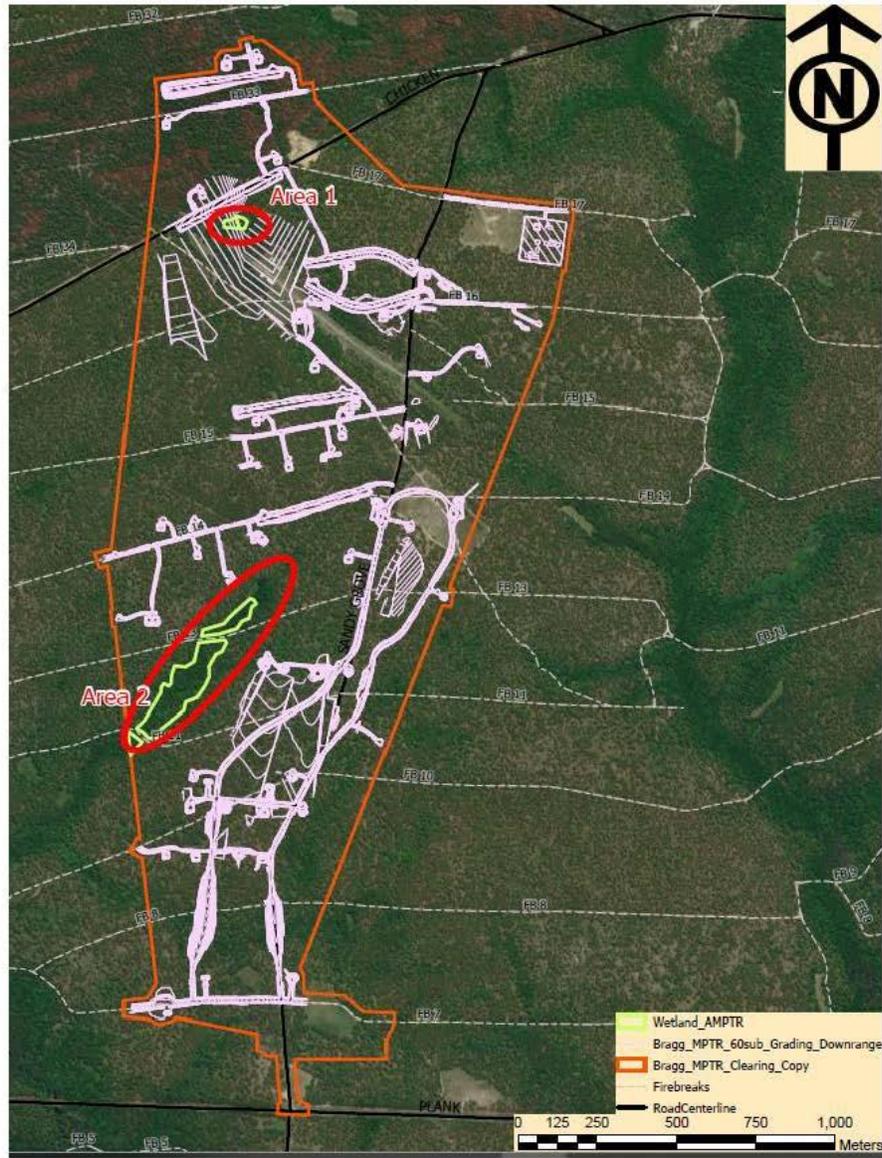


Draft FONPA 7

Enclosure 2: Location of Alternatives 4-5 with Environmental Overlay (Does not include SDZ)

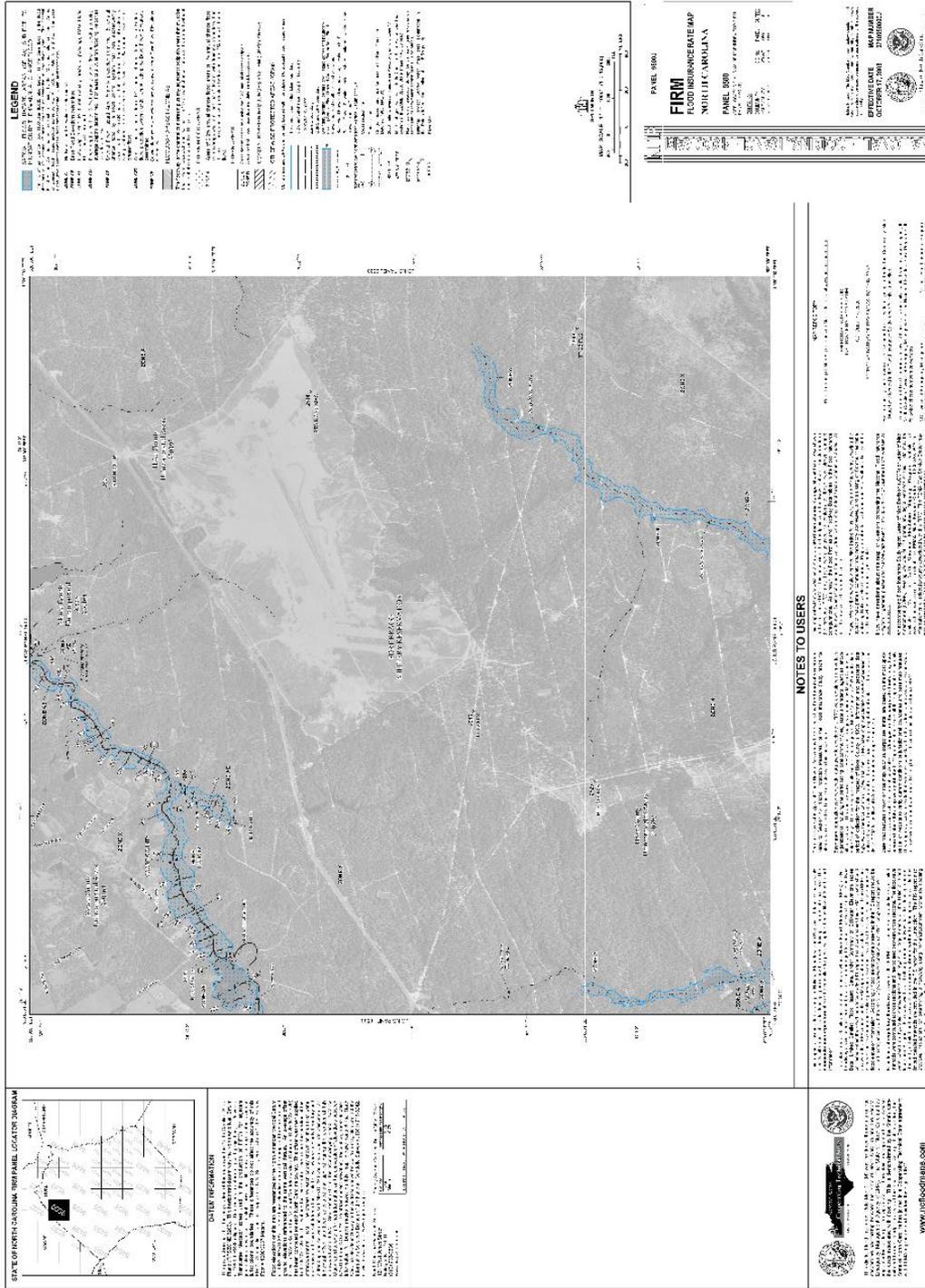


Enclosure 3: Location of Impacted Wetlands within Preferred Alternative



Draft FONPA 9

Inclusion BB: IPBC Floodplain Map





DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BRAGG
2175 REILLY ROAD, STOP A
FORT BRAGG NORTH CAROLINA 28310-5000

MITIGATED FINDING OF NO SIGNIFICANT IMPACT
for the
CONSTRUCTION AND OPERATION OF A MULTIPURPOSE TRAINING RANGE
AND FIELDING THE MOBILE PROTECTED FIREPOWER VEHICLE at FORT
BRAGG, NORTH CAROLINA

1. Background. The U.S Army Fort Bragg Directorate of Public Works completed an environmental assessment (EA) to construct and operate a multipurpose training range, and field the mobile protected firepower vehicle at Fort Bragg, North Carolina. The EA was undertaken in accordance with the National Environmental Policy Act of 1969 (NEPA) and Title 32 of the Code of Federal Regulations (CFR), Part 651, to inform decision makers and the public of likely environmental consequences of the proposed actions and alternatives and provide a forum for public feedback.

The EA and draft mitigated Finding of No Significant Impact (FNSI) were made available for public review and interagency coordination from 16 August 2022 to 16 September 2022. These documents were furnished to state and federal agencies (through the North Carolina Department of Administration) and the public for 30-days online at <https://fb.me/FortBraggEnvironmentalAssessments> and at the following libraries:

- Cumberland County Library, 300 Maiden Lane, Fayetteville, NC 28301.
- John L. Throckmorton Library, Building 1-3346, Randolph Street, Fort Bragg, NC 28310
- Harnett County Library, 455 McKinney Parkway, Lillington, NC 27546
- Hoke County Public Library, 334 N. Main Street, Raeford, NC 28376
- Moore County Library, 101 Saunders Street, Carthage, NC 28327

Written comments and questions concerning the EA and its analyses were directed to: Ms. Ginny Carswell, NEPA Coordinator, United States Army Installation Management Command, Headquarters, United States Army Garrison, Fort Bragg, 2175 Reilly Road, Stop A, Fort Bragg, North Carolina (NC) 28310. Ms. Carswell was also available for questions regarding the EA by phone at (910) 396-9888 and by email at virginia.l.carswell.civ@army.mil.

2. Proposed Action. The proposed action would construct and operate a multipurpose training range (MPTR; Project Number 96182) at Fort Bragg, North Carolina. The range would support operation of the MPF vehicle. The 82nd Airborne Division would receive a MPF battalion and the MPF companies would maintain a tactical alignment with the Infantry Brigade Combat Teams (IBCTs). The proposed automated range would support mounted vehicles to include the new mobile protected firepower (MPF) vehicle. The MPF capability includes firing large caliber rounds following gunnery standard for the mobile gun system. According to an 8-9 October 2019 planning charrette lead by the Department of the Army (DA) Combined Arms Center, Fort Bragg is deficient of

FNSI-1

mounted gunnery ranges. Fort Bragg requires a mounted gunnery range allowing long-distance firing for Soldiers to both train and qualify. In addition to the IBCTs, all mounted gunnery units within the 18th Airborne Corps Separate Brigades, the 30th Armor Brigade Combat Team NCARNG, the United States Army Special Operations Command and visiting United States Marine Corps units would utilize the MPTR. The EA and draft FNSI detailed five possible alternatives as follow:

Alternative 1: No Action Alternative: The No Action Alternative would not construct and operate a MPTR, and not equip the IBCTs with the MPF. This alternative does not meet the purpose and need; however, the Council of Environmental Quality and Army NEPA regulations require consideration and analysis of the No Action Alternative to provide a baseline against which the other alternatives may be compared.

Alternative 2: Construct and operate a range south of McPherson Impact Area with MPF gunnery capability. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range surface danger zone (SDZ) would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Construction would start north of Plank Road at Firebreak 7 expanding north to avoid demolition of Sandy Grove Church and the associated cemetery. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of unexploded ordnance (UXO) support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). The proposed alternative would directly adversely affect 11 federally endangered red-cockaded woodpecker (RCW) clusters. Tree removal would occur within a federally endangered *Schwalbea americana* plant site¹, however, would not require removal or disturbance of this species. Additionally, two species at risk (SAR) occur within the proposed project footprint and will be impacted by range construction and operation. One pyxie moss (*Pyxidantha brevifolia*)² site coincides with the proposed project footprint site and one population of Heller's cudweed (*Pseudognaphalium helleri*)³. Additionally, range construction would fill 0.3 acres of an isolated wetland and convert 8.8 acres of a forested wetland to a non-forested wetland.

Alternative 3: Construct and operate a range south of McPherson Impact Area without MPF gunnery capability. The proposed location is outside of any existing impact area; implementation of this range construction and corresponding range SDZ would expand McPherson Impact Area west to Rockfish Creek, south to Plank Road, and east to Raeford Vass Road. Construction would start north of Plank Road at Firebreak 7

¹ SCAM023A

² PYBR074A

³ PSHE029A

expanding north. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed alternative would directly adversely affect 11 RCW clusters. Tree removal would occur within a federally endangered *Schwalbea americana* plant site⁴, however, would not require removal or disturbance of this species. Additionally, two SAR occur within the proposed project footprint, and will be impacted by range construction and operation. One pyxie moss (*Pyxidantha brevifolia*)⁵ plant site coincides with the proposed project footprint and one population of Heller's cudweed⁶ (*Pseudognaphalium helleri*). Additionally, range construction would fill 0.3 acres of an isolated wetland and convert 8.8 acres of a forested wetland to a non-forested wetland.

Alternative 4: Construct and operate a range southwest of McPherson Impact Area with MPF capability (starting at Plank Road). The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). The proposed project would intersect a major tributary of Rockfish Creek; the construction and full range operation would impact a portion of these designated wetlands (approximately 98.79 acres of wetlands and 20,733 linear feet of stream). Alternative 4 construction and operation would impact four archeological sites⁷ and one potential archeological site⁸. The proposed MPTR construction and operation would potentially adversely impact nine RCW clusters, four pyxie moss SAR *Pyxidantha brevifolia* sites⁹, one bog spicebush SAR (*Lindera subcoriacea*) site¹⁰, one pine barren boneset SAR (*Eupatorium resinosum*) site¹¹, and one Chapman's yellow-eyed grass SAR (*Xyris chapmanii*) site¹².

⁴ SCAM023A

⁵ PYBR074A

⁶ PSHE029A

⁷ 31HK1562, 31HK1567, 31HK1584, and 31HK3676

⁸ 31HK617

⁹ PYBR017F, PYBR026F, PYBR026G, PYBR026H

¹⁰ LISU016A

¹¹ EURE048A

¹² XYCH013A

Alternative 5: Construct and operate a range southwest of McPherson Impact Area without MPF capability (starting at Plank Road). The proposed location is outside of any existing impact area; implementation of this range construction would expand McPherson Impact Area and range SDZ west to King Road, north to Morganton Road, and south to Plank Road. The newly expanded portion of McPherson Impact Area would be non-dudded. The project will include 24 months of UXO support since the proposed project construction will occur within the training area of an active military installation (DA, 2019). Fort Bragg Soldiers would conduct all live-fire MPF training at Fort Stewart, Georgia. The proposed project would intersect a major tributary of Rockfish Creek; the project would remove vegetation, construct within, and fully operate within designated wetlands (approximately 98.79 acres of wetlands and 20,733 linear feet of stream). Alternative 5 construction and operation would impact four archeological sites¹ and one potential archeological site². The proposed MPTR construction and operation would potentially adversely impact nine RCW clusters, four pyxie moss SAR *Pyxidantha brevifolia* sites¹³, one bog spicebush SAR (*Lindera subcoriacea*)¹⁴ site, one pine barren boneset SAR (*Eupatorium resinotum*) site¹⁵, and one Chapman's yellow-eyed grass SAR (*Xyris chapmanii*) site¹⁶.

3. Anticipated Environmental Impacts. The EA detailed screening criteria, and analyzed each alternative, and selected the alternative meeting the purpose and need of the proposed action using the listed screening criteria. The screening criteria analysis determined the preferred alternative as Alternative 2 (construct and operate a range south of McPherson Impact Area with MPF gunnery capability). The analysis in the EA determined implementing Alternative 2 would result in non-significant impacts to soil erosion/water resources, threatened and endangered species, and wetlands. The proposed project and alternatives had been vetted through state and federal regulatory personnel the duration of the scoping process. Regulatory conclusions are as follows:

a. Soil Erosion/Water Resource Impact: Alternative 2 will comply with the soil conservation measures and the Installation's Stormwater Management Permit (NCS000331). The Fort Bragg Water Management Section will review designs prior to any ground disturbance to ensure adherence to permit conditions.

b. Threatened and Endangered Species. The United States Fish and Wildlife Service (USFWS) issued a biological opinion (BO) on 14 June 2022 that the proposed action is not likely to jeopardize the continued existence of either the federally endangered red-cockaded woodpecker (RCW) or American chaffseed. Additionally, the

¹³ PYBR017F, PYBR026F, PYBR026G, PYBR026H

¹⁴ LISU016A

¹⁵ EURE048A

¹⁶ XYCH013A

USFWS determined the action is not likely to adversely affect the federally endangered Saint Francis' satyr, rough-leaved loosestrife, or Michaux's sumac by letter dated 26 January 2022.

The USFWS determined nondiscretionary reasonable and prudent measures exist to minimize the amount or extent of RCW incidental take thereby resulting in a non-significant impact to the RCW including:

- Develop and coordinate a cluster management plan to minimize loss of RCWs from clusters directly affected by range construction.
- Minimize/Avoid impacts to RCW breeding groups during the breeding season (April – July).
- Develop a cluster management plan to minimize loss of RCWs from clusters that will be subject to heavy downrange impacts.

c. Wetlands. Wetland impacts identified in the EA and Finding of No Practicable Alternative included filling and grading a 0.3-acre isolated wetland, and conversion of an 8.8-acre forested wetland to a non-forested wetland. The United States Army Corps of Engineers and North Carolina Division of Environmental Quality determined wetland permitting would not be required to execute the proposed project.

4. USFWS EA Public Comments. The USFWS contacted the Fort Bragg NEPA Coordinator, Ms. Ginny Carswell, on 16 September 2022 requesting a seven-day extension to provide draft comments no later than 23 September 2022. Ms. Carswell confirmed by e-mail and through a telephone conversation with Mr. John Hammond, USFWS Biologist, acknowledging and confirming a seven-day extension to submit comments. Written comments were received 27 September 2022 (Enclosure 1). The paraphrased USFWS comments and Fort Bragg responses are provided as follows.

a. *“ the EA does not provide sufficient information regarding the planning constraints and other factors affecting the location of the MPTR...The document would benefit from a more thorough discussion of the criteria used to evaluate and screen alternatives, how alternatives were formulated and the reasoning for identifying the proposed action as the preferred alternative. The EA in its current form does not present a clear case that the preferred alternative is the least environmentally damaging practicable solution.”*

Fort Bragg Response: The Department of the Army directed that the MPF be fielded at Fort Bragg to support the 82d Airborne in future combined arms combat operations. The Fort Bragg Senior Commander approved the location of the MPTR to maximize the MPF capability during training and to maximize the simultaneous throughput of all ranges to support the combat readiness posture of the Army's largest installation. The Fort Bragg Master Planning Division assisted in generating alternatives and rationale of reasonable alternatives for the proposed action. Fort Bragg utilized the master planning

process as detailed in the 2010 *Programmatic Environmental Assessment for the Implementation of the Real Property Master Plan*. This PEA evaluated the 2008 Long-Range Component (LRC) of the Real Property Master Plan and the use of the master planning process at Fort Bragg. The 2008 LRC detailed future functionality based on identified land use zones.

Per the guidance in 32 CFR 651.15, Mitigation and Monitoring, the *Construction and Operation of a Multipurpose Training Range and Fielding the Mobile Protected Firepower Vehicle at Fort Bragg, North Carolina* EA considered all alternatives meeting the purpose and need for the proposed action that were appropriate and reasonable. Function, location, and environmental impacts were cross leveled to determine the best suited alternative.

Screening criteria included:

- Support mission requirements. Alternatives considered must support and provide for the mission requirements of Soldiers at the Installation.
- Maintain regulatory compliance. Alternatives considered must allow for compliance with all state and federal regulations.
- Maintain safety of Soldiers and Civilians. Alternatives considered must not pose any danger to any Soldiers or Civilians on the Installation.
- Avoid significant impacts to environmentally sensitive resources. Alternatives considered must avoid significant impacts to environmentally sensitive resources on the Installation.

Per the Directorate of Plans, Training, Mobilization and Security (DPTMS), one of the most important considerations or criteria affecting locating the MPTR from a training perspective is the weapon systems surface danger zone (SDZ). The SDZ delineates the area personnel may safely operate, move, maneuver, and engage targets; provides limits of fire to contain the vertical and lateral containment of projectiles, fragments, ricochet, and debris from firing the weapon system; and delineates areas for target placement. The size and shape of the SDZ for the MPTR range was based on the type of weapon system (MPF) and ammunition (105mm projectiles). The preferred alternative provides the required open maneuver area within the SDZ; and military units the ability to maneuver into, out of, and between battle positions and engage down range targets while operating in a non-duded area. Site the maneuver space inside the duded area is impractical and cost prohibitive due to the requirement to clear unexploded ordinance. The SDZ for the preferred alternative would affect less training areas, future proposed ranges, and training facilities as opposed to all the other alternatives. Additionally, drop zones and much of the force on force (FOF) training occurring on Fort Bragg north of Longstreet Road would be unaffected by the preferred alternative. In sum, the preferred alternative would impact training considerably less across the landscape than all the other alternatives.

Line of Sight (LOS) was another important consideration when considering alternative sites for the MPTR. The MPTR operational requirement must establish direct line of sight from both stationary and moving firing points to affectively engage downrange targets. Many of the weapon systems that will validate their formations on the MPTR utilize laser range finders that provide a solution to the on-board computer that automatically adjusts and corrects for lead when engaging targets from a moving platform. This system allows the vehicle to automatically track the target and engage without the gunner having to provide input and adjustments. The preferred alternative has less LOS issues compared to the other alternatives. To establish LOS within the other alternatives would require a considerable amount of earthwork which would escalate cost and potential environmental impacts.

Alternative 1 – As the battlefield increasingly becomes more complex the requirement at the installation level is to reconfigure training land to replicate the realism of a real-world threat and to enable new maneuver training capabilities to meet the Senior Mission Commanders intent of validating formations at home station rather than at combat training centers. The ICBT's will be equipped with the MPF's. Taking no action and not building the required MPTR range would not meet the training requirement for gunnery validation for that equipment, nor would it meet the Senior Mission Commander's intent for Fort Bragg to provide that maneuver live fire capability.

Alternative 3 – Alternative 3 was not practical to construct an MPTR range without MPF gunnery and require live fire to be conducted at Fort Stewart, Georgia. The requirement to rail-load MPF vehicles to Ft Stewart for live fire and transport soldiers would be cost prohibitive and would not meet the Senior Mission Commanders intent of validating formations at the home station. There are no additional impacts from MPF vehicles above and beyond what will be experienced from other vehicle systems conducting mounted live fire on the MPTR. A MPTR without MPF live fire capability offers no training value to the MPF units. Alternative 3 would impact federally endangered species but not result in a significant biological impact defined as substantial permanent conversion or net loss of habitat at the landscape scale; long-term loss or impairment of a substantial portion of local habitat (species-dependent); and unpermitted "take" of threatened and endangered species (DA, 2021).

Alternative 4 was eliminated since the SDZ would impact operation use of Holland Drop Zone, Nijmegen UAS facility, All American LZ, Marshall LZ, several artillery firing positions, and create concerns with the SDZ being in close vicinity to King Road. The alternative would also impact 98.79 acres of wetlands, 20,733 linear feet of stream, and create additional costly maintenance requirements for maneuver in and around wetlands. This alternative would impact 9 RCW clusters. Alternative 4 would impact greater SAR comparatively. Alternative 4 would impact federally endangered species but not result in a significant biological impact according to definition (DA, 2021). Alternative 4 would also impact archeological sites.

Alternative 5 was eliminated for the combined training reasons listed for Alternatives 3 and 4. Alternative 5 would simulate Alternative 4 impacts to SAR, wetlands, and linear feet of stream. Alternative 5 would impact federally endangered species but not result in a significant biological impact according to definition (DA, 2021). Alternative 5 would impact archeological sites and approximately 98.79 acres of wetlands and 20,733 linear feet of stream.

Alternatives 1, and 3-5 did not fulfill the purpose and need of the project. Alternatives 4 and 5 would incur the greatest impact to wetlands and streams. Therefore, Alternatives 3, 4, and 5 were eliminated from full analysis in this EA based on the alternatives screening process.

b. The EA identifies future projects including a proposed Infantry Platoon Battle Course which specifically has potential to affect at least 17 additional RCW groups that are part of the same population. Other projects include the Automatic Record Fire Plus Range and the Scout/ Recce Gunnery Complex. None of these future projects have been assessed in detail with respect to their potential impacts, individually or cumulatively, on RCW. RCW conservation and recovery are reliant on Fort Bragg and the Department of the Army's ability to protect, manage and sustain long-term native ecosystems that support the species. This may best be achieved where these future projects are considered together so that the timing, intensity, duration, frequency and spatial distribution of these actions on the species are examined as a whole. The Service would be better able to assist the Army in identifying effects and measures to mitigate adverse effects to RCW and the longleaf pine ecosystem if we had a more full understanding of the collective effects of these projects.

Fort Bragg Response: The EA identified anticipated projects, associated foreseeable project locations, and estimated resource impacts using data available at the time of EA publication. Quantified resource impacts were estimations based on geographical approximations; corresponding designs for projects considered for cumulative impacts were non-existent at the time of EA publication. The Directorate of Public Works (DPW) and DPTMS are actively analyzing alternative locations for all projects specified in the EA to satisfy the project purpose and need, while minimizing environmental resource impacts.

c. 'Proactive habitat management practiced on the installation since the early 1990's has delivered very constructive results, and the installation attained its RCW population recovery goal in 2005. These actions included growing season prescribed burns, hardwood midstory control, thinning of dense stands of young pines, and a carefully administered artificial cavity provisioning program. Effectiveness of these habitat management tools is dependent on the frequency, timing, duration and intensity of their application. The challenges posed by constructing and operating the new range will add significantly to program complexity.'

Fort Bragg Response: DPTMS training integrates environmental planning into the decision-making process for range development to proactively meet both the challenges of an evolving training landscape to meet the requirements of the mission, and the prudent management of natural resources on Fort Bragg. Protection of the training environment which includes the management of the MPTR is provided with strict adherence to Fort Bragg Regulation 350-6 during training exercises. Additionally, Fort Bragg established a Training Lands Working Group (TLWG) comprised of DPTMS and DPW Environmental Division subject matter experts to discuss management practices, develop a five-year plan to identify and manage priority training areas, complete, and prioritize habitat management prescriptions for three training areas annually in support of the Fort Bragg training mission. The TLWG meets at minimum quarterly.

7. Citizen EA Public Comments. Written comments were received on 16 September 2022 from the Law Office of Marsh Smith, P.A. (Enclosure 2) which are re-iterated below with responses from the associated Fort Bragg subject matter expert(s).

a. Considering the thousands of acres of cleared and environmentally degraded training lands on Fort Bragg, the limited alternatives analysis for the MPTR lacks any discernible effort to avoid or minimize impacts to relatively intact, high quality environmental resources. In fact, the siting of the MPTR maximizes the impacts to critical environmental resources (red-cockaded woodpecker (RCW) clusters; intact native ground covers; high quality, old longleaf pine forest with some trees > 250- 300 years old; and prime wildlife habitats).

Fort Bragg Response: The Army evaluated three alternatives in addition to the no action and the proposed action as detailed under number 2 of this FNSI.

Per the DPTMS, the Fort Bragg forest is largely homogenous across all the training areas with an even class of longleaf pine (*Pinus palustris*). Alternative sites would impact RCW clusters similarly as previously described. Although the preferred alternative seems to maximize impact to critical environmental resources, it is the only alternative that satisfies training requirements pertaining to the footprint of the SDZ, LOS, and maneuvering in a non-duded impact area while minimizing training constraints to drop zones and highly utilized Force on Force (FOF) exercises in training areas in the northern tier of Fort Bragg.

Subsequently, the USFWS also concurred with Fort Bragg's determination that the proposed project is likely to adversely affect the RCW and America chaffseed, however, will not likely jeopardize the continued existence of either species resulting from the proposed mitigation measures below and discretionary conservation measures to minimize impacts attached as Enclosure 3.

- Develop and coordinate a cluster management plan to minimize loss of RCWs from clusters directly affected by range construction.
- Minimize/avoid impacts to RCW breeding groups during the breeding season (April – July).
- Develop a cluster management plan to minimize loss of RCWs from clusters that will be subject to heavy downrange impacts.

The significant impacts to wetlands along with the associated mitigation costs makes Alternatives 4 and 5 unfeasible. Moreover, mitigation cost for impacting 98.79 acres of wetlands for Alternatives 4 and 5 would total approximately \$14,016,161. This is based on current wetland mitigation cost per credit (\$70,939) at a conservative 2:1 mitigation ratio assuming most wetland impacts would be from wetlands clearing/conversion for LOS. This cost does not account for stream impacts for crossings along Rockfish Creek.

b. I understand that the Chief Range Officer has publicly stated that development of the preferred alternative will cause permanent loss of critical maneuver training lands on Fort Bragg, a commodity already in short supply on the Post by thousands of acres - a loss that in itself will cause problems. The EA fails to describe how the Post will compensate for the loss of training space and also fails to describe the environmental effects of such redirected training.

Fort Bragg Response: The battlefield is increasingly becoming more complex creating requirements at the installation level to reconfigure training land to replicate the realism of a real-world threat and to accommodate improved weapon capabilities. The training land capability is not lost but is enhanced as the training land is reconfigured and new ranges are constructed. The construction of the MPTR range enhances both maneuver and live fire capability in an area where anything more than light maneuver forces on foot was restricted due to terrain and movement in a wooded environment.

c. By the Army's own admission, soils at Fort Bragg are not suitable for heavy armored vehicles, in other words, tanks. A 40-ton armored vehicle, known as Mobile Protected Firepower (MPF), as described in the EA, amounts to a tank, regardless of what name the EA applies to it. One needs not be Wm. Shakespeare to conclude that "a tank by any other name remains a tank."

Fort Bragg Response: Per Lee Ward, Fort Bragg Water Management Section Chief, tank trails and transition trails within the range footprint will be armored (i.e., gravel, stone, concrete, etc.) and maintained to minimize/prevent erosion from MPF maneuvers. The MPF will be restricted to these improved travel-ways. The soils in the MPF range footprint are almost entirely (99.7%) comprised of Blaney loamy sand, Candor sand, Dothan loamy sand, Fuquay sand, Gilead loamy sand, and Vaucluse loamy sand. All these soils possess the properties suitable for development with little to no limitations. As stated above, armoring of the travel ways will enable these moderate

to well-drained soils to support MPF maneuvers with minimal impacts. These same soil properties are conducive to herbaceous plant species native to the Sandhills region promoting the natural groundcover necessary to prevent erosion and sedimentation from MPF activities.

d. I have come to understand that the soils on and around the LZ near Chicken Road have exposed or shallowly imbedded layers of kaolinite, a water impervious clay (gumbo). This clay layer has contributed to sheet flow erosion in the northern part of the proposed MPTR and along Chicken Road for decades. When wet, it provides poor to no traction for vehicles. MPF training in this area will only exacerbate onsite erosion, offsite erosion and siltation in Rockfish Creek. Exposed kaolinite does not revegetate naturally because of a high concentration of aluminum and hardness.

Fort Bragg Response: Per Lee Ward, Fort Bragg Water Management Section Chief, Tank trails and transition trails within the range footprint will be armored (i.e., gravel, stone, concrete, etc.) and maintained to minimize/prevent erosion from MPF maneuvers. The MPF will be restricted to these improved travel ways. Sedimentation and erosion control measures such as vegetative swales, riparian buffer areas, skimmer sediment basins, and detention basins will be installed and maintained to prevent siltation from damaging surface waters such as Rockfish Creek. An erosion control permit will be reviewed/approved by monthly sedimentation and erosion control inspections conducted by the Fayetteville Regional Office of Division of Energy, Mineral, Land Resources to ensure that the project results in no sedimentation damage generated from the project.

According to Fort Bragg DPTMS, a major core component of the Fort Bragg Integrated Training Area Management (ITAM) program is the Land Rehabilitation and Maintenance program. The Land Rehabilitation and Maintenance (LRAM) program provides soil stabilization and vegetation management to maintain, improve, and repair the training environment to sustain the tough realistic training occurring on maneuver areas and ranges. The LRAM team consists of a design engineer and heavy equipment operators who provide design expertise for the construction of sediment and erosion control measures to sustain the integrity of the training environment while conserving natural resources. The LRAM program is postured and resourced to quickly respond and remediate maneuver damage to the MPTR during live fire maneuver gunnery.

e. The Army joined America's Longleaf Pine Initiative, which is dedicated to the restoration and conservation of longleaf pine forests of the Southeast. The preferred alternative in the EA will destroy more than 1300 acres of old second-growth and old growth longleaf pine. The Army proposes no mitigation. The affected longleaf forest qualifies as some of the best longleaf pine habitat on Fort Bragg, in North Carolina, and in the Southeast. The native ground cover in these areas has immeasurable value and can never be restored, even if the range is abandoned in the future. Either alone or combined with other planned ranges, I fail to discern any concern for the long-term

sustainability of the longleaf pine resource. Conserving the longleaf ecosystem requires frequent growing season fires and no more than diffuse/ minimal soil impacts. Normal training (foot and light vehicles) use, already pushes the disturbance threshold to its limits. Destroying relatively intact longleaf forests and native ground covers leads directly to invasive species and the exceedingly costly and often unsuccessful control measures.

Fort Bragg Response: At the time of the EA public availability, the proposed range design impacted 816 acres; range operation was slated to impact an additional approximate 500 acres. As confirmed by Rod Fleming (Fort Bragg Endangered Species Act Section 7 and 9 Wildlife Biologist); the entire range footprint would be cleared of trees, of which 160 acres will be grubbed and graded. The remaining acres between firing points and targets would be maintained as interstitial habitat comprised of native, low-growing plants and forbs to support line of sight. These habitats would be maintained by frequent fire which will inhibit non-native invasive species that are intolerant of fire. This is supported by evidence of lack of invasive species on similar ranges across the installation such as Range 78/79. Subject matter expert conclusions in the published EA were derived from analyzing the 35% project designs. Subsequent design iterations demonstrate the proposed clearing limits have been reduced by approximately 100 acres. See Enclosure 3 for the proposed mitigation measures to reduce impacts below the level of significance as approved by the USFWS in the 26 January 2022 Biological Opinion.

Per DPTMS, the MPTR footprint requires clearcutting to establish LOS from both stationary battle positions and while moving between battle positions or firing points. The cleared area will provide gunners and tank commanders the ability to acquire and engage both stationary and moving targets. Many of the weapon systems that will utilize the MPTR utilize laser range finders that provide a solution to the on-board computer system that automatically adjusts and corrects when engaging targets from a moving platform. This system allows the vehicle to automatically track the target and engage without the gunner having to adjust. Leaving tree cover on the range would disrupt the ability of the weapon system to engage the target, establish LOS and receive a valid return for a range determination rendering the weapon system useless.

Clearcutting will impact the native ground cover but will not completely remove it. The intent is not to grub the area of ground cover following tree removal but ensure the long-term protection of wire grass and any sensitive plants that occur on site. The future maintenance of the range only requires the removal of subsequent tree cover following clear cut to the extent necessary to establish LOS for target engagements.

Per Jason Monroe, Chief of the Fort Bragg Forestry Branch, prescribed burning for the MPTR would remain on a three year or less rotation with no extension of frequency. Fire frequency on the MPTR will likely cycle on one to two years, and the area surrounding

the range will likely cycle on a two-year rotation. The frequent fire will help support residual native grasses outside of the lanes and targets and will likely be the primary means of maintenance.

f. The Army has committed to ambitious goals to fight and adapt to ongoing climate change. The permanent removal of 1300+ acres of old growth and old second growth longleaf pines runs counter to these stated goals. Besides the permanent loss of the existing and potential carbon storage onsite, the MPF units will store these vehicles on the main cantonment area of the Post. Driving, or trucking, such vehicles to the MPTR will increase the use of fossil fuels and air pollution, which the Army could reduce significantly by locating the MPTR closer to the storage / maintenance facilities.

Fort Bragg Response: According to Fort Bragg DPTMS, Fort Bragg maintenance facilities are not in the vicinity due to SDZ requirements, and operation of firing ranges situated along MacRidge, Longstreet, and Chicken Roads. The closest impact area to a maintenance facility is MacRidge Road. This facility lacks necessary maneuver space in a non-dudded area, or depth required for the SDZ and 105 mm weapon system. The maneuver box where targets would be engaged would have to be either in the impact area or extend into the cantonment area which would require clearance of unexploded ordinance making this impractical. Based on current installation land use, the MPTR required siting within existing range fans and adjacent to an existing impact area per Fort Bragg Master Planning.

According to Michael Fischer, Fort Bragg Air Quality Program Manager, all the alternatives except the Alternative 1 would increase greenhouse gas (GHG) emissions resulting from land clearing, construction equipment and range operation in the short term. Longer term, the vegetation removed from the range will diminish carbon sequestration/sink potential from the project site. A restored, healthy ecosystem surrounding the range will enhance long-term carbon sequestration.

The operating phase of the proposed range will result in increased GHG emissions due to transportation emissions. The Army attempts to optimize decisions to repair, reconfigure, and maintain sustainable maneuver training areas to minimize or mitigate GHG emissions. Moreover, the Army has been working to reduce the fossil fuel consumption of its vehicle fleets for many years, and recent gains are encouraging. Siting the proposed range closer to the maintenance and storage facilities could minimize potential transportation GHG emissions; however, the preferred alternative was sited to maximize range training safety, accessibility and minimize overall environmental impacts.

Global direct and indirect GHG emissions will not significantly increase; however, cumulative GHG emissions would be augmented by implementing any of the alternatives barring Alternative 1. The Army relies on land management and

conservation to preserve local environments in compliance with laws and regulations while maintaining access for training, testing, and mission requirements. The Army will continue to manage forests and ranges to enhance carbon sequestration. The Army continues to focus on climate change mitigation goals outlined in the Army Climate Strategy while executing the prompt and sustained land dominance as part of the Joint Force.

g. The 82nd Airborne Division and 2nd Marine Corps Division (based at Camp Lejeune) both serve as rapid deployment forces. Recently, the Marines ceased using tanks and heavy artillery, making a relatively new tank range available at Camp Lejeune. The Army could easily station some of the new MPF vehicles at Camp Lejeune for live fire training, just as the Marines have made frequent use of Fort Bragg for artillery training.

Fort Bragg Response: Fort Bragg DPTMS has indicated that the 82d Airborne Division and 2nd Marine Division have different mission sets as rapid deployment forces. The Fort Bragg training environment provides mutually beneficial ample opportunities for the 82nd Airborne Division and the 2nd Marine Corps Division to train across the landscape. While the Marines may not have a future training requirement on Camp Lejeune for tanks and heavy artillery, their focus for these training areas are for light expeditionary force training. As is the case with Fort Bragg, the 2nd Marine Corps Division is adapting to the current battlefield by reconfiguring their training land to meet their specific mission requirement. It is impractical to station MPF vehicles or any other maneuver vehicles at Camp Lejeune without having the necessary personnel on site to conduct maintenance checks and services to keep vehicles operating effectively maintaining operational readiness. These vehicles require daily maintenance to prevent their function and operation from degrading. Maintenance of assigned equipment is a required skill for each occupational job specialty.

h. The MPTR will require designation of a new Impact Area and Safety Danger Zone (SDZ). At one time the Post implemented a moratorium on new Impact Areas. What happened to that policy?

Fort Bragg Response: The moratorium was for creating of duded impact area. The MPTR will be a non-duded range.

i. One encounters difficulty imagining a more irresponsible action than placing a building associated with the MPTR on top of an active RCW cluster and the only old-growth longleaf pine stand on Fort Bragg, behind Sandy Grove Church. Yet the Army has actually proposed such a ridiculously inappropriate siting decision, when the Army could easily avoid this site.

Fort Bragg Response: According to Rod Fleming, Fort Bragg ESA Section 7 and 9 Wildlife Biologist, the only feasible layout option for the Range Operations Cantonment Area (ROCA) is at the current location based on topography, SDZ, and range training requirements. Shifting the range forward or to the west, away from the RCW Cluster, would require large amounts of fill and associated costs that would be detrimental to the project. The contractor designing the MPTR provided the following feedback during the analysis for the biological assessment (BA) as Fort Bragg considered actions to minimize impacts to RCW Cluster 251, which is adjacent to the ROCA: *“The ROCA is always behind the range Baseline (behind the firing line), so that limits the available footprint for placement. If you look at the contours behind the Baseline, the only viable option for locating the ROCA is in its current location. We discussed shifting it to the west outside of the RCW area (and still behind the Baseline), but the terrain is so bad there that the costs to build it would be detrimental to the project. In addition, the ROCA area on a maneuver range like this is generally more spread out (which would take away more habitat in addition to the cavity trees). The current design has the ROCA area consolidated as much as possible to limit those impacts. Another option would be to move the Baseline forward or downrange and move the ROCA forward with it (out of the RCW area). As you recall, we studied that in detail in our line of sight (LOS) analysis and determined that the required earthwork to satisfy all training requirements was detrimental to the project. SDZ was also a concern.”* Additionally, in coordination with USFWS, Fort Bragg has implemented conservation measures to retain Cluster 251 on the landscape, although cavity trees and some forage habitat will be lost. Sufficient foraging habitat will remain (approximately 169.49 acres) post-project to support the existing breeding group. Fort Bragg has mitigated the loss or “take” of Cluster 251. Replacement cavities have been provisioned outside of the range clearing limits to offset the loss of existing cavity trees. Cluster management is likely to be successful in sustaining the potential breeding group at Cluster 251.

Most of the pine stands within the MPTR footprint are between 80-90 years old, however, these stands are not considered old-growth stands (>150 years old). Fort Bragg has 48,364 acres of pine stands \geq 80 years old. Fort Bragg has identified and tagged 10,636 old-growth trees across the installation. There are seventy old-growth pine trees that have been identified within the range footprint that would be removed (0.006%).

The preferred alternative is the only alternative that meets all the other requirements pertaining to the footprint of the SDZ, LOS, maneuvering in a non-duded impact area, and reduced impact to other training features such as drop zones and the high use of training areas in the northern tier of the Fort Bragg training areas that are used for FOF exercises.

j. Both the Army's Biological Assessment (BA) and USFWS Biological Opinion (BO) ignore the fact that partition level analysis inadequately measures impacts where RCW

groups occur close together. Under such circumstances, biologists have long known that RCW's often share home ranges. Accordingly, 2 or 3 RCW groups may regularly use a given acre of habitat. Standard partition level analysis assumes use by only 1 group. Therefore, both the BA and the BO likely underestimate impacts to RCW groups bordering the MPTR, perhaps substantially, because they fail to use the "best available science" and fail to acknowledge this shortcoming.

Fort Bragg Response: Per Rod Fleming, Fort Bragg ESA Section 7 and 9 Wildlife Biologist, Fort Bragg's methodology for analyzing impacts at the partition level, group level, neighborhood level, and population level systematically followed the "Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker Recovery Plan: *Second Revision*". This USFWS document provides guidance for use of the foraging habitat standards in the RCW recovery plan, has been through extensive USFWS regional office review, and is the standard in the preparation of biological assessments and biological opinions.

Forage habitat analysis were conducted using a computer-based program called the RCW Foraging Matrix Application (Matrix), which evaluates the overall quality of foraging stands within their associated partition. The RCW forage area was determined using geographic information systems (GIS) to create forage partitions based on previous foraging guidelines that all foraging habitat be allocated within 0.5 miles of the center of the cluster. This technique creates Thiessen polygons from the epicenter of each cluster, and then applying tabular data of stand characteristics to determine availability of foraging habitat within each partition. The habitat is divided up equally among clusters where foraging circles overlap. If a partition has no overlap, it is extended out to a 0.5-mile radius circle, unrestrained (Henry 1989). The revised partition development method was created by Lipscomb in the early 1990s and accounts for the complication of allocating forage area for overlapping forage partitions (Lipscomb and Williams 1996, 1998).

The Matrix was used to conduct an RCW forage habitat analysis (FHA) to determine quantity and quality of forage habitat pre-project and post-project (USFWS 2005). The Matrix evaluated the overall quality and quantity of forage stands within the partition/s. The FHA evaluated project impacts in relation to the two forage habitat standards: the Standard for Managed Stability (SMS) and Recovery Standard (RS). The SMS defines the minimum foraging habitat requirements considered necessary to avoid foraging habitat-related incidental take. On a case-by-case basis with the support of local demographic data, a "not likely to adversely affect" may be determined for forage partitions that currently do not meet the SMS or are currently above but will go below the SMS. The RS defines foraging habitat requirements considered necessary to meet or retain recovery within an individual population.

In particular, the Matrix determined if the RS requirement of 120 contiguous acres > 30-year-old pine stands of Good Quality Forage Habitat (GQFH) was met pre- and post-project. Also, the analysis determined if the SMS requirements were met. The SMS requires a minimum of 75 acres of contiguous GQFH for pine stands > 30 years of age and > 3,000 square feet (ft²) of basal area (ba) for pine trees > 10-inch diameter at breast height (dbh).

Also, the Matrix analysis assessed several habitat-related parameters that affect RCW demographics (e.g., neighborhood dynamics), group fitness (e.g., reproduction, group size, and adult survival), and dispersal. Stand-level characteristics assessed by the Matrix program include but are not limited to:

- stand age,
- average pine ba > 10-inch dbh between 40 and 70 ft²/ac,
- average pine ba for 10-inch dbh pines < 20 ft²/ac,
- total ba of all pines > 10-inch dbh with a minimum of 40 ft²/ac,
- overstory hardwood canopy percent <10%, < 80 ft²/ac,
- more than 18 stems/ac of pines > 60 years of age and 14-inch dbh with minimum ba of 20 ft²/ac,
- ba of pines between 10- and 14-inch dbh is between 0 and 40 ft²/ac,
- preferable that 50% or more of this habitat lies within the 0.25-mile area,
- 40% or more herbaceous ground cover,
- no hardwood midstory persists and is not to exceed height (<7 ft) and sparse density,
- frequent growing season fire return interval and season of last prescribed burn, etc.

This information was used collectively to formulate an FHA summary for each RCW cluster. The Matrix totals were summarized and the overall suitability and values in the RS and SMS were determined within these reports.

Although understood that the RCW groups may share habitat, the Matrix determines adverse impacts at the SMS level (a minimum of 75 acres of contiguous GQFH). A “not likely to adversely affect” was determined for forage partitions that currently do not meet the SMS or are currently above but will go below the SMS. This analysis also considered loss of cavity trees. In the analysis, Fort Bragg determined that six RCW clusters would be directly impacted within the clearing limits of the range by the loss of cavity trees and forage habitat. The following six clusters would lose many of their cavity trees and forage habitat: Cluster 114 (100% cavities and 100% habitat); Cluster 271 (100% cavities and 72% habitat); Cluster 272 (100% cavities and 71% habitat); Cluster 111 (100% cavities and 100% habitat); Cluster 115 (77% cavities and 77% habitat); and Cluster 152 (100% cavities and 93% habitat). It was also determined that an additional five groups may be lost within the area downrange where live operations could

potentially impact RCW forage and cavity trees. The following five clusters would lose the majority of their cavity trees and forage habitat: Cluster 603 (89% cavities and 60% habitat); Cluster 112 (100% cavities and 100% habitat); Cluster 110 (100% cavities and 80% habitat); Cluster 194 (92% cavities and 99% habitat); and Cluster 113 (100% cavities and 99% habitat). This analysis is based on a scenario where munitions could travel from the firing position to beyond the target position potentially impacting RCW habitat and cavity trees. This is also based on the ballistics of munitions that are expected to be fired with the frequency, duration, and intensity to cause damage downrange. Live fire impacts to RCW trees and habitat are anticipated only in the direct firing line (DFL) and dispersion area (DA) portions of the SDZ with the highest probability of direct impacts to occur within the DFL. Over time, the DFL zone is expected to lose some of the existing forest from live fire activities with trees remaining between firing lanes, at farther distances from the firing points and within areas spared from impacts due to topography. However, so as not to underestimate impacts, the biological assessment analyzed direct impacts to RCW cavity trees and habitat using a “worst case” scenario and assumed all suitable habitat within the DFL would be lost.

Seven additional clusters bordering the MPTR were analyzed within the DFL for potential impacts to forage habitat. Fort Bragg’s determination, using the worst-case scenario, was that these clusters could potentially lose some forage habitat but would retain more than sufficient habitat to persist on the landscape. Six of the seven clusters met the RS requirement of 120 acres of contiguous potentially good quality forage habitat (PGQFH). Cluster 452 will retain <120 acres of PGQFH (108.6 acres) but will incur minimal forage loss (0.7%) post-project. The understanding that some clusters may share habitat only bolsters the determination that these clusters will have more than sufficient habitat to persist on the landscape and maintain long-term viability. Additionally, Fort Bragg conducted a group level analysis and assessed impacts to clusters bordering the MPTR 1.25 miles out from clusters within 0.5 mile of the clearing limits. A total of 46 active or breeding clusters were analyzed within this area examining the project’s impact on demographic health or stability. Stand contiguity was considered to assess degree of group isolation. Also, since isolation affects group fitness, it is believed that a certain density of groups is considered necessary to maintain demographic health. To date, most studies have evaluated group fitness based on the number of groups within 1.25 miles of the project area or target group (Conner and Rudolph, 1991; Hooper and Lennartz, 1995; Crowder *et al.*, 1998). Research has shown that clusters with ≤ 2.5 active clusters within 1.25 miles were considered “sparse,” and therefore more vulnerable to abandonment because of lack of emigration/ immigration (Conner and Rudolph, 1991). Group densities, like those found on Fort Bragg, are much higher now and abandonment is rare due to active management like cavity replacement (Walters, 2021). All clusters analyzed within 1.25 miles had densities ≥ 9.0 active groups post-project and are unaffected by the associated project. This determination was supported through communication with Dr. Jeff Walters.

It is Fort Bragg's determination, based on best available science provided in the biological assessment and supported by the biological opinion, the impacts were not underestimated but may likely be overestimated.

k. This major project has significant environmental and training impacts. The EA provides neither a sufficient analysis nor an appropriate method of analysis, and a finding of no significant impact (FONSI) SHOULD NOT issue. The National Environmental Policy Act (NEPA) requires the preparation of an Environmental Impact statement (EIS) for the MPTR.

Fort Bragg Response: The Construction and Operation of a Multipurpose Training Range and Fielding the Mobile Protected Firepower Vehicle at Fort Bragg, North Carolina environmental assessment signed 16 August 2022 integrated analysis and paralleled levels of significance as defined in the Mobile Protected Firepower (MPF) Finding of No Significant Impact signed 22 October 2021 as follows:

Significant - an adverse environmental impact which, given the context and intensity, violates or exceeds regulatory or policy standards, would substantially alter the function or character of the resource area, or otherwise meets an identified threshold.

Impacts to air quality would be considered significant if the Proposed Action would result in a National Ambient Air Quality Standards (NAAQS) attainment area becoming a nonattainment area, a violation of Clean Air Act (CAA) Title V operating permits or synthetic minor permit, or generation of substantial Green House Gas (GHG) emissions nationwide (> 650,000 metric tons carbon dioxide (CO₂) equivalents per year).

Significant water quality impacts would include surface water pollutant concentrations exceeding the Total Maximum Daily Loads designated by the Clean Water Act or a persistent increase in turbidity. Significant groundwater impacts would include contaminant discharges leading to groundwater concentrations exceeding Safe Drinking Water Act Maximum Contaminant Levels. Other significant water quality impacts would include a violation of an existing permit, or loss/destruction of more than one acre of jurisdictional wetlands without appropriate mitigation.

Significant land use impacts generally would occur when more than 5,000 acres is removed from public use. This is a matter of context and intensity, however, and sizes deemed 'significant' may vary depending on the size of the installation. Socioeconomic significant impacts would include a long-term change in sales, income, employment, or population for the impacted area.

Significant hazardous material impacts would occur when substantial additional risk to human health or safety would be attributable to Army actions.

A significant impact occurs if noise emissions are loud enough to threaten or harm human health or result in violation of applicable federal, state, or local noise ordinance. A significant biological impact would include substantial, permanent conversion or net loss of habitat; or would result in long-term loss or impairment of a substantial portion of local habitat (species-dependent); and/or result in the unpermitted "take" of threatened and endangered species. The Biological Assessment analysis determined that the proposed action would impact 1,317.26 acres of RCW forage habitat and incur incidental take of 11 RCW Potential Breeding Groups (PBGs) on Fort Bragg. The analysis also identified the potential loss of 159 cavity trees that would occur from the clearing of the range (91 cavity trees) and range operations (68 cavity trees). In 2020, Fort Bragg documented 521 active clusters and an estimated 461 Potential Breeding Groups (PBGs) on Fort Bragg. In 2021, Fort Bragg documented 527 active clusters and an estimated 465 PBGs. The loss of 11 PBGs is 2.36% of the 465 PBGs and 2.0% of the 527 active RCW clusters on Fort Bragg. Additionally, Fort Bragg has approximately 127,542 acres of RCW forage habitat across the installation. The impact to 1,317 acres of RCW forage from the construction and operation of the MPTR is approximately 1.0% of the overall habitat. No adverse impacts were determined at the neighborhood or population levels. After subtracting all RCW groups expected to be "taken" post-construction and operation of the MPTR, Fort Bragg will be able to manage approximately 450 PBG's, well above the population recovery goal established in the 2003 RCW Recovery Plan. There is no unpermitted "take" of threatened or endangered species associated with this project. Based on the information provided, the impacts to RCW groups and their associated habitats are not considered to be significant.

A significant Cultural and Historical Resource impact would include concerns raised by Indian Tribes regarding potential impacts to properties of religious and cultural significance; impact to historic archaeological sites; or direct/indirect alteration of the characteristics that qualify a property for inclusion in the NRHP without appropriate mitigation.

A significant impact to public health and safety would include exposure of the public to harmful levels of chemical constituents or physical conditions caused by the system.

8. Division of Emergency Management EA Public Comments: The North Carolina State Clearinghouse provided comments on 20 September 2022 (Enclosure 4). The Division of Emergency Management indicated: "From the information provided, portion of the proposed project occurs within a designated floodplain. Please ensure regulatory compliance with EO 11988 and 44 CFR for the floodplain management." Fort Bragg requested clarification from the commentor on 20 September 2022 to which the commentor replied on 21 September 2022 "The floodplain related comments were from the following project descriptions on the EA report: Page 35:" The eastern-most perimeter of the proposed IPBC range occurs within a designated floodplain (see EA Inclusion BB)"also page 35 : "The proposed Scout occurs within a designated

floodplain (See EA Inclusion DD)....". The IPBC and Scout ranges will not be executed as part of the MPTR, however, were included in the EA to analyze cumulative impacts of any foreseeable projects affecting resources analyzed in the MPRT EA.

9. Conclusion. The EA was prepared in accordance with the NEPA (40 CFR 1500 *et seq.*), the Council on Environmental Quality regulations, and Environmental Analysis of Army Actions, 32 CFR, Part 651. Based on a review of the information contained in the EA, I have determined that the proposed action to construct and operate the multipurpose training range and fielding the mobile protected firepower vehicle at Fort Bragg, North Carolina would not have a significant impact on the quality of the human or natural environment on the Installation or in nearby communities, nor does it constitute a major federal action. Therefore, the preparation of an Environmental Impact Statement is not required and the mitigated FNSI is appropriate. This decision complies with legal requirements and has been made after accounting for all submitted information.

10. References.

Conner, R. N., and D. C. Rudolph. 1991. Forest habitat loss, fragmentation, and red-cockaded woodpecker populations. *Wilson Bulletin*. 103:446-457.

Crowder, L. B., J. A. Priddy, and J. R. Walters. 1998. Demographic isolation of red-cockaded woodpecker groups: a model analysis. Project Final Report, prepared for U.S. Fish and Wildlife Service.

Department of the Army (DA). *Mobile Protected Firepower (MPF) Life Cycle Environmental Assessment*. October 2021.

Department of the Army (DA), 2010. *Master Plan, Fort Bragg, NC: Long Range Component*. Fort Bragg, NC: Prepared for DPW by Parsons Corporation under the direction of the United States Army Corps of Engineers-Savannah District. August 2010.

Henry, G, U.S Fish and Wildlife Service. 1989. Guidelines for preparation of biological assessments and evaluations for the red-cockaded woodpecker.

Hooper, R. G., and M. R. Lennartz. 1995. Short-term response of a high density red-cockaded woodpecker population to loss of foraging habitat. Pages 283-289 *in* D. L. Kulhavy, R. G. Hooper, and R. Costa, editors. *Red-cockaded woodpecker: recovery, ecology, and management*. Center for Applied Studies in Forestry, College of Forestry, Stephen F. Austin State University, Nacogdoches, Texas, USA.

Lipscomb, D. J., and T. M. Williams. 1996. A technique for using PC-ARC/INFO GIS to determine red-cockaded woodpecker foraging areas on private lands. Pages 255-264 *in*

Proceedings of the southern forestry geographic information systems conference.
University of Georgia, Athens, Georgia, USA.

Lipscomb, D. J., and T. M. Williams. 1998. Spatial changes in RCW management constraint areas over a ten-year period on Hobcaw Barony. Pages 57-68 in SOFOR GIS '98: 2nd southern forestry GIS conference. University of Georgia, Athens, Georgia, USA.

U.S. Fish and Wildlife Service. 2005. Implementation Procedures for Use of Foraging Habitat Guidelines and Analysis of Project Impacts under the Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan: Second Revision. U.S. Fish and Wildlife Service, Atlanta, GA.

Walters J.R. 2021. Personnel email communication with Dr. Jeff Walters on group densities related to RCW cluster abandonment, the Group Level Analysis (GLA), Neighborhood Level Analysis (NLA) and Population Level Analysis. July 2021

11. Federal and State Regulations Cited

Environmental Analysis of Army Actions, 32 CFR Part 651.

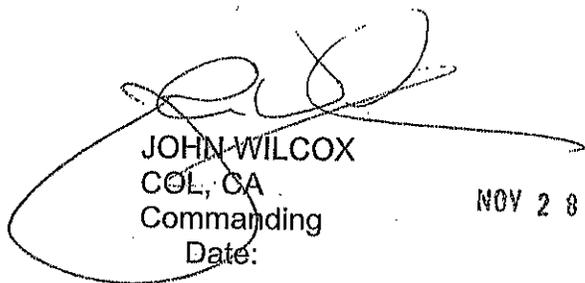
Environmental Protection Agency, Protection of Environment, 32 CFR Part 260-299

Endangered Species Act of 1973 (as amended), U.S. Fish and Wildlife Service, Washington, DC, 1988.

Federal Emergency Management Agency, Department of Homeland Security, 44 CFR.

National Environmental Policy Act of 1969 (as amended; 40 CFR 1500 et seq.), U.S. Environmental Protection Agency, Washington, D.C., 1975.

Government Printing Office (GPO), 1997. Executive Order 11988 (Floodplain Management). 42 Federal Register 26951. Washington, DC. 24 May 1977.



JOHN WILCOX
COL, CA
Commanding
Date:

NOV 28 2022

Enclosure 1



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

September 27, 2022

Ms. Ginny Carswell
NEPA Coordinator
U.S. Army Installation Management Command
Headquarters, United States Army Garrison, Ft Bragg
2175 Reilly Road, Stop A
Fort Bragg, North Carolina 28310-5000

Dear Ms. Carswell:

The Fish and Wildlife Service (Service) has reviewed the August 2022 Environmental Assessment and Draft Mitigated Finding of No Significant Impact for the Construction and Operation of a Multipurpose Training Range and Fielding the Mobile Protected Firepower Vehicle at Fort Bragg, North Carolina (EA). The project will involve the elimination of about 1,317 acres of managed pine forest, which serves as an essential military maneuver training environment and as primary habitat for endemic, rare and federally listed species, including the red-cockaded woodpecker (*Picoides [=Dryobates] borealis*; RCW). Our comments are provided in accordance with the National Environmental Policy Act (NEPA)(40 CFR 1500 et seq.), the Council on Environmental Quality regulations, and Environmental Analysis of Army Actions, 32 CFR, Part 651.

The Service's June 14, 2022 Biological Opinion concluded that the effects of the Action, including cumulative effects are "...not likely to jeopardize the continued existence of the RCW." However, the proposed Action's effects are not inconsequential. RCWs are sensitive to habitat fragmentation and completion of the Action will significantly fragment an otherwise highly functioning and resilient RCW population. Ranges and impact areas occupy approximately 33,040 acres in the central, interior portion of Fort Bragg (Fort Bragg ESMC 2018). Six major drop zones (DZs) comprise 4,514 acres of cleared areas. With these acreages committed to existing open space for live-fire ranges, impact areas, and drop zones, the project involves creation of 1,317.26 acres of additional open space. This new open space will result in the loss of the highest-quality RCW habitat supporting the Sandhills East Primary Core Recovery Population – and some of the most stable RCW breeding groups on Fort Bragg outside of the installation's impact areas. Range construction and operation would also convert general maneuver area into space dedicated exclusively to operating the MPTR. Loss of terrain forested with native pine trees contributes to erosion, introduction of non-native species and diminishes sustainability of training lands. Use of existing cleared space, e.g., a standing range or range in combination with a drop zone should be seriously considered, to minimize loss of forested land.

The preceding paragraph is provided to underscore the fact that while the proposed action is not likely to jeopardize the continued existence of the RCW, it would represent the largest single adverse impact to RCW's and the longleaf ecosystem in the NC Sandhills in the past few decades. With that in mind, we note a couple portions of the EA that could benefit from additional information or support.

Regarding the alternatives analysis, the EA does not provide sufficient information regarding the planning constraints and other factors affecting the location of the MPTR to allow the reader to determine if an appropriate range of reasonable alternatives were considered and appropriately evaluated. This may be in part due to the extensive use of military terminology that can be challenging for the civilian reader to penetrate. The document would benefit from a more thorough discussion of the criteria used to evaluate and screen alternatives, how alternatives were formulated and the reasoning for identifying the proposed action as the preferred alternative. The EA in its current form does not present a clear case that the preferred alternative is the least environmentally damaging practicable solution.

Regarding the analysis of cumulative impacts, we note that cumulative impacts are assessed differently under the ESA and NEPA. Impacts associated with federal actions that will be the subject of future consultations under Section 7 of the ESA are not considered cumulative impacts under the ESA, while they are in the context of NEPA. The EA identifies future projects including a proposed Infantry Platoon Battle Course which specifically has potential to affect at least 17 additional RCW groups that are part of the same population. Other projects include the Automatic Record Fire Plus Range and the Scout/ Recce Gunnery Complex. None of these future projects have been assessed in detail with respect to their potential impacts, individually or cumulatively, on RCW. RCW conservation and recovery are reliant on Fort Bragg and the Department of the Army's ability to protect, manage and sustain long-term native ecosystems that support the species. This may best be achieved where these future projects are considered together so that the timing, intensity, duration, frequency and spatial distribution of these actions on the species are examined as a whole. The Service would be better able to assist the Army in identifying effects and measures to mitigate adverse effects to RCW and the longleaf pine ecosystem if we had a more full understanding of the collective effects of these projects.

Range-wide RCW recovery and projections of the species' future status rely heavily on the conservation actions of major federal partners, not the least of which is Fort Bragg. Proactive habitat management practiced on the installation since the early 1990's has delivered very constructive results, and the installation attained its RCW population recovery goal in 2005. These actions included growing season prescribed burns, hardwood midstory control, thinning of dense stands of young pines, and a carefully administered artificial cavity provisioning program. Effectiveness of these habitat management tools is dependent on the frequency, timing, duration and intensity of their application. The challenges posed by constructing and operating the new range will add significantly to program complexity.

Thank you for the opportunity to provide these comments and for your continued cooperation with our agency. We look forward to continuing to work with Fort Bragg as this and future projects are developed on the installation. If you have any questions regarding this matter, please contact Mr. John Hammond at 919-856-4520 (Ext. 28).

Sincerely,



Digitally signed
by PETER
BENJAMIN
Date: 2022.09.27
15:16:29 -0400'

Pete Benjamin
Field Supervisor

Literature cited:

Fort Bragg. 2018. Integrated Natural Resources Management Plan 2019 – 2023,
Fort Bragg and Camp Mackall, North Carolina. Directorate of Public
Works, Environmental Division, Fort Bragg, North Carolina.

Enclosure 2

Law Office of Marsh Smith, P.A.

Physical Address: 255 West New York Avenue, Southern Pines, NC 28387
Mailing Address: PO Box 1075, Southern Pines, NC 28388-1075
Phone: (910) 695-0800 / Fax: (910) 695-0903
E-mail: marsh@marshsmithlaw.com

16 September 2022
Via Email [virginia.l.carswell.civ@army.mil]

Attention: Ms. Virginia L. Carswell
NEPA Coordinator
Fort Bragg, NC 28310

Re: Comments Submitted on the EA for the Fort Bragg Environmental
Assessment for Multipurpose Training Range (MPTR)

Dear Ms. Carswell:

As someone who has frequented Ft. Bragg since childhood and who has continued to hold keen interest in the stewardship of the natural resources on the Post, I offer the following comments on the environmental assessment (“EA”) for the proposed Multipurpose Training Range (“MPTR”):

1. Considering the thousands of acres of cleared and environmentally degraded training lands on Fort Bragg, the limited alternatives analysis for the MPTR lacks any discernible effort to avoid or minimize impacts to relatively intact, high quality environmental resources. In fact, the siting of the MPTR maximizes the impacts to critical environmental resources (red-cockaded woodpecker (RCW) clusters; intact native ground covers; high quality, old longleaf pine forest with some trees > 250 – 300 years old; and prime wildlife habitats).
2. I understand that the Chief Range Officer has publicly stated that development of the preferred alternative will cause permanent loss of critical maneuver training lands on Fort Bragg, a commodity already in short supply on the Post by thousands of acres – a loss that in itself will cause problems. The EA fails to describe how the Post will compensate for the loss of training space and also fails to describe the environmental effects of such redirected training.
3. By the Army’s own admission, soils at Fort Bragg are not suitable for heavy armored vehicles, in other words, tanks. A 40-ton armored vehicle, known as Mobile Protected Firepower (MPF), as described in the EA, amounts to a tank, regardless of what name the

EA applies to it. One needs not be Wm. Shakespeare to conclude that “a tank by any other name remains a tank.”

4. I have come to understand that the soils on and around the LZ near Chicken Road have exposed or shallowly imbedded layers of kaolinite, a water impervious clay (gumbo). This clay layer has contributed to sheet flow erosion in the northern part of the proposed MPTR and along Chicken Road for decades. When wet, it provides poor to no traction for vehicles. MPF training in this area will only exacerbate onsite erosion, offsite erosion and siltation in Rockfish Creek. Exposed kaolinite does not revegetate naturally because of a high concentration of aluminum and hardness.
5. The Army joined America’s Longleaf Pine Initiative, which is dedicated to the restoration and conservation of longleaf pine forests of the Southeast. The preferred alternative in the EA will destroy more than 1300 acres of old second-growth and old growth longleaf pine. The Army proposes no mitigation. The affected longleaf forest qualifies as some of the best longleaf pine habitat on Fort Bragg, in North Carolina, and in the Southeast. The native ground cover in these areas has immeasurable value and can never be restored, even if the range is abandoned in the future. Either alone or combined with other planned ranges, I fail to discern any concern for the long-term sustainability of the longleaf pine resource. Conserving the longleaf ecosystem requires frequent growing season fires and no more than diffuse / minimal soil impacts. Normal training (foot and light vehicles) use, already pushes the disturbance threshold to its limits. Destroying relatively intact longleaf forests and native ground covers leads directly to invasive species and the exceedingly costly and often unsuccessful control measures.
6. The Army has committed to ambitious goals to fight and adapt to ongoing climate change. The permanent removal of 1300+ acres of old growth and old second growth longleaf pines runs counter to these stated goals. Besides the permanent loss of the existing and potential carbon storage onsite, the MPF units will store these vehicles on the main cantonment area of the Post. Driving, or trucking, such vehicles to the MPTR will increase the use of fossil fuels and air pollution, which the Army could reduce significantly by locating the MPTR closer to the storage / maintenance facilities.
7. The 82nd Airborne Division and 2nd Marine Corps Division (based at Camp Lejeune) both serve as rapid deployment forces. Recently, the Marines ceased using tanks and heavy

artillery, making a relatively new tank range available at Camp Lejeune. The Army could easily station some of the new MPF vehicles at Camp Lejeune for live fire training, just as the Marines have made frequent use of Fort Bragg for artillery training.

8. The MPTR will require designation of a new Impact Area and Safety Danger Zone (SDZ). At one time the Post implemented a moratorium on new Impact Areas. What happened to that policy?
9. One encounters difficulty imagining a more irresponsible action than placing a building associated with the MPTR on top of an active RCW cluster and the only old-growth longleaf pine stand on Fort Bragg, behind Sandy Grove Church. Yet the Army has actually proposed such a ridiculously inappropriate siting decision, when the Army could easily avoid this site.
10. Both the Army's Biological Assessment (BA) and USFWS Biological Opinion (BO) ignore the fact that partition level analysis inadequately measures impacts where RCW groups occur close together. Under such circumstances, biologists have long known that RCW's often share home ranges. Accordingly, 2 or 3 RCW groups may regularly use a given acre of habitat. Standard partition level analysis assumes use by only 1 group. Therefore, both the BA and the BO likely underestimate impacts to RCW groups bordering the MPTR, perhaps substantially, because they fail to use the "best available science" and fail to acknowledge this shortcoming.
11. This major project has significant environmental and training impacts. The EA provides neither a sufficient analysis nor an appropriate method of analysis, and a finding of no significant impact (FONSI) **SHOULD NOT** issue. The National Environmental Policy Act (NEPA) requires the preparation of an Environmental Impact statement (EIS) for the MPTR.

Thank you for the opportunity to comment.

Sincerely,



Marsh Smith

MITIGATION AND MONITORING PLAN
for the
CONSTRUCTION AND OPERATION OF A MULTIPURPOSE TRAINING RANGE
AND FIELDING THE MOBILE PROTECTED FIREPOWER VEHICLE

1.0 Introduction

Compliance with the National Environmental Policy Act (NEPA) and associated regulations, including the Army's NEPA Regulation (36 CFR 651) require: identification of mitigation measures for potential adverse impacts; selection of mitigation measures to implement with an action alternative; and monitoring of the selected mitigation measures for effectiveness and enforcement.

The President's Council on Environmental Quality (CEQ) describes mitigation as:

- **Avoidance:** Avert the impact by changing the plan. Do not take certain actions that would cause the environmental effect.
- **Minimization:** Curtail impacts by changing the intensity, timing, or duration of the action and its implementation.
- **Rectifying:** Remedy, repair, or restore damage that may be caused by implementing the proposed action.
- **Reducing:** Decrease or eliminate the impact over time.
- **Compensation:** Offset the impact by improving the environment elsewhere or by providing other substitute resources such as funds to pay for the environmental impact.

1.1 Mitigation Planning Process

Mitigation through avoidance and environmentally sensitive design, such as establishment of buffers, has been used to avoid impacts to sensitive resources to the maximum extent practicable. Mitigation by design was used when determining multipurpose training range (MPTR) alternative locations during the initial site screening phases. An interdisciplinary team of environmental, engineering, regulatory, military operations, and planning professionals used Geographic Information System (GIS) data and existing information to eliminate unreasonable alternatives and reduce and validate

potential alternatives. The process helped mitigate potential environmental impacts by eliminating consideration of sites with potentially more significant environmental impacts and focusing design on sites that support the mission while reducing environmental impacts. Section 4.2.2.3 of the environmental assessment addresses mitigation.

Fort Bragg formally consulted with the United States Fish and Wildlife Service (USFWS) to comply with the Endangered Species Act (ESA) due to American chaffseed (*Schwalbea Americana*) and red-cockaded woodpecker (*Dryobates borealis*; RCW) impacts. Fort Bragg engaged the USFWS prior to submitting the final BA by providing the project scope, endangered species impacts, and mitigation plan. Fort Bragg incorporated feedback from the USFWS into the final BA for review. The Fort Bragg biological assessment outlined specific mitigation measures for the USFWS to consider when issuing their biological opinion.

2.0 Mitigation Phases

Mitigation activities are characterized by each phase (i.e., pre-construction, construction, operation, and maintenance) of the Proposed Action. Mitigation measures are currently being and will be implemented due to adverse impacts to endangered species.

2.1 Pre-Construction and Construction Phase Mitigation

Some potential adverse impacts identified for the construction phase were mitigated through the design process. Fort Bragg environmental, range operations and planning personnel met with the project architect and engineering firm to discuss how to avoid environmental impacts. For example, the initial design included extirpation of American chaffseed site SCAM023A. The team revised the plan to exclude grading or grubbing within SCAM023A. The Fort Bragg botanist and forestry personnel will coordinate with the United States Army Corps of Engineers to develop tree harvesting methodology to minimize endangered plant impacts within SCAM023A. Individual plant stems will be flagged prior to tree removal within SCAM023A. Additionally, perimeter boundary signs will be posted around SCAM023A indicating prohibited foot and vehicular traffic within the site.

Prior to red-cockaded woodpecker (RCW) breeding season (1 April – 31 July), Fort Bragg Endangered Species Branch will review RCW group status in/adjacent to the construction area and identify any extant habitat within the construction area that: (a) falls within a cluster or (b) falls within 0.25-mile of a breeding group that has less than 75 acres of available foraging habitat. As a result, tree removal will not occur within these identified clusters during breeding season.

Additionally, active RCW cavity trees will be removed outside of RCW breeding season. See Table for RCW cavity trees slated for removal due to the proposed project. Screens will be installed over cavities to exclude RCW use on cavity trees slated for removal. Artificial cavities will be provisioned at least four weeks ahead of the time projected for when active cavity trees in the construction area will be screened for removal.

Table. Cavity Trees Proposed for Removal

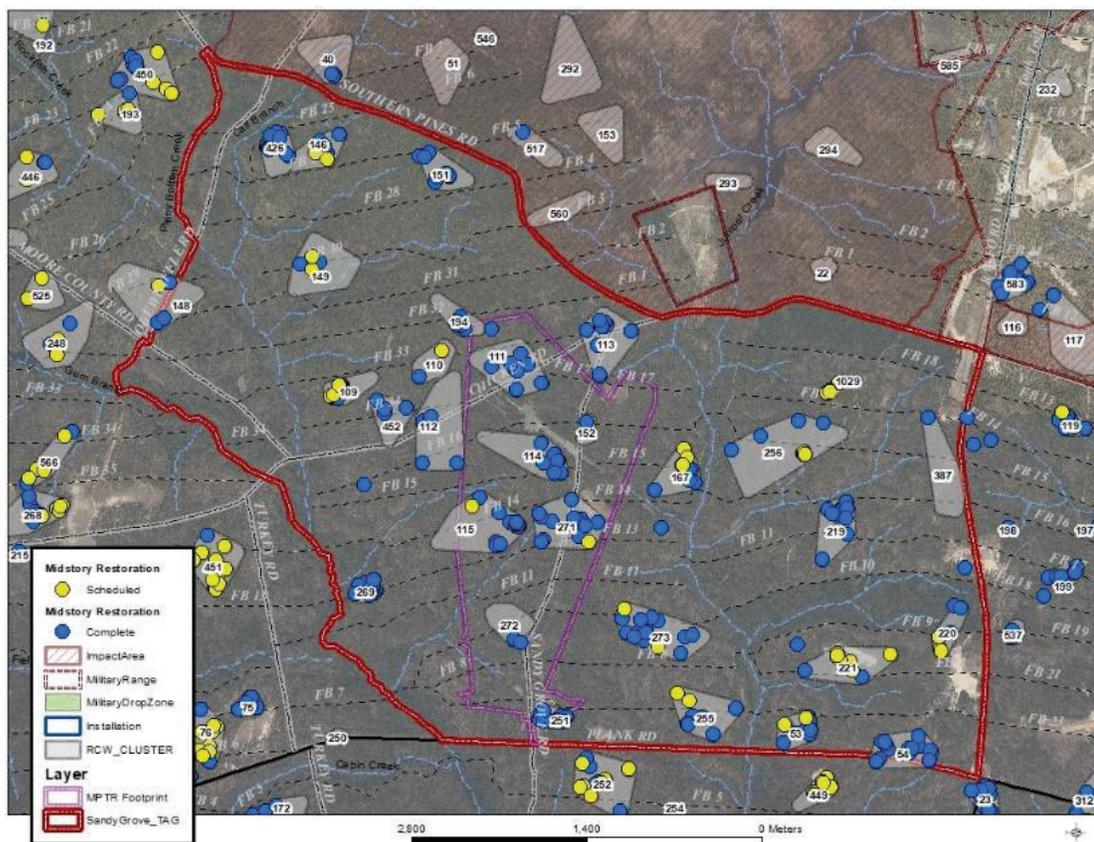
Range Clearing													
Cluster: Total Trees	Cluster #	Tree #											
17	111	2597	2598	2600	5078	5080	5090	5450	9105	9916	10289	11520	11521
# Impacted	17	12760	18208	1946E	1990E	2672E							
% Removal	100.0%												
16	114	0209E	0210E	2795	3400	4666	5430	5431	5432	9047	9109	9264	9995
# Impacted	16	18071	2842E	3202E	3203E								
% Removal	100.0%												
17	115	2801	2811	2814	6556	9450	9947	9976	11901	12843	1625E	1626E	1627E
# Impacted	13	2827E											
% Removal	76.5%												
9	152	9491	9492	9909	9977	10705	12888	2349E	2350E	2399E			
# Impacted	9												
% Removal	100.0%												
13	194	18292											
# Impacted	1												
% Removal	7.7%												
12	251	2774	3618	4618	14500								
# Impacted	4												
% Removal	33.3%												
15	271	0182E	0184E	2803	2804	2805	2806	2807	2808	5048	12724	14820	18004
# Impacted	15	2728E	2825E	2826E									
% Removal	100.0%												
9	272	2765	2766	3048	4620	4642	12838	18003	2425E	2449E			
# Impacted	9												
% Removal	100.0%												

Other measures were identified in the BA to improve surrounding RCW habitat and to utilize resources for educational purposes including:

- The Fort Bragg Endangered Species and Forestry Branches will coordinate with the contract logger to determine if RCW cavity trees will be collected for educational purposes or destroyed on-site.
- The Fort Bragg Endangered Species Branch (using in-house and contracted personnel) will continue RCW monitoring to include cluster activity status and group follows pending site access provided by the Directorate of Planning, Training, Mobilization and Security (DPTMS).

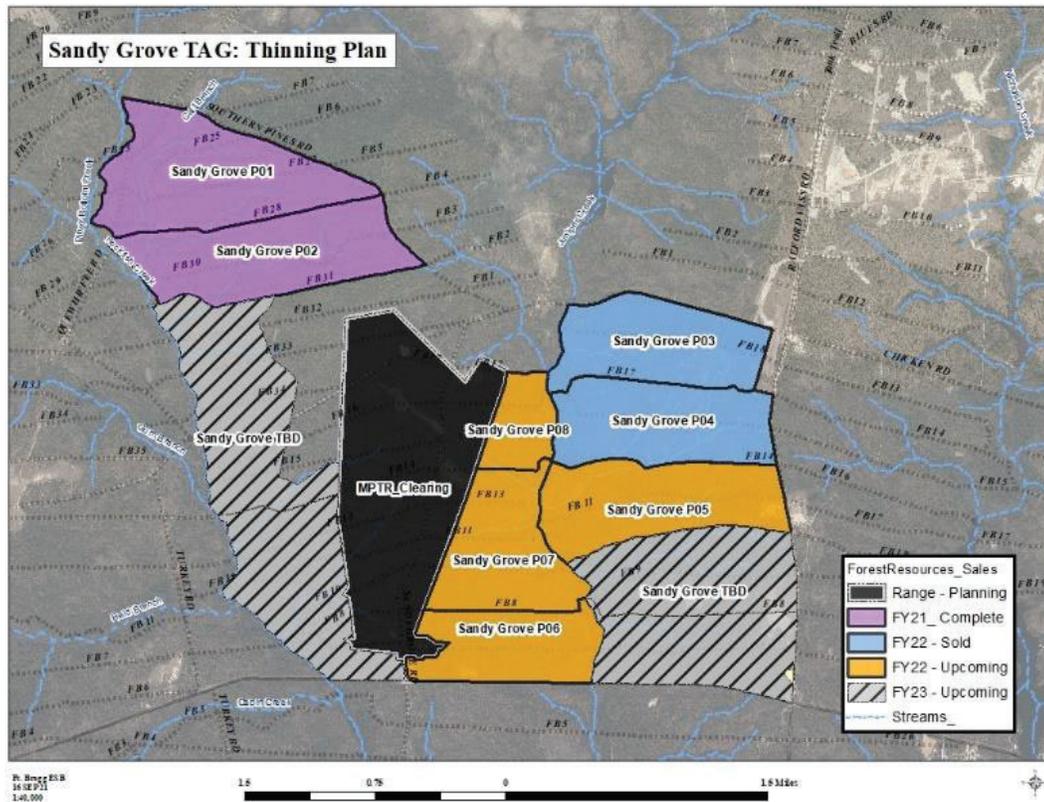
- The Fort Bragg Forestry Branch will continue prescribed burns in and around the proposed project area, emphasizing growing season burns.
- The Fort Bragg Endangered Species Branch is currently supervising a contract to conduct (funded through environmental quality funds) midstory treatments within and around the project location to ensure the RCW standard of managed stability and recovery standard is met as defined in to 2003 RCW Guidelines (USFWS). Priority management targets RCW cluster cores; and locations determined by RCW cluster activity status, group fitness, neighborhood analysis or training lands working group (TLWG) prescriptions. Midstory treatments will be completed no later than 30 June 2022. See Figure 1.

Figure 1. Midstory Treatment Location



- The Fort Bragg Forestry Branch will mark, sell, and oversee all pine thinning in the adjacent project area (designated as Sandy Grove TAG) to improve forest stands. Thinning will occur during the proposed project pre-construction and construction phases. See Figure 2.

Figure 2. Pine Thinning Location



2.2 Operation Phase Mitigation

The operational phase would begin after construction is complete. Soldiers would begin training on the MPTR. Fort Bragg Environmental Division and the G3/DPTMS would continue to work closely ensuring all mitigation requirements are implemented as planned.

- RCW clusters anticipated to be “taken” but remaining on the landscape will be protected, monitored, and provisioned, where applicable, for at least five years to determine cluster activity through in-house Endangered Species Branch or existing contracted personnel. These clusters could later contribute towards Fort Bragg RCW recovery goals should Fort Bragg provide adequate documentation to the USFWS that these clusters are viable, stable, and fecund.
- Fort Bragg Endangered Species Branch will develop a plan to minimize loss of RCWs from clusters subject to downrange operational impacts to include

identifying suitable sites where artificial cavities can be provisioned that allows for groups losing habitat resulting from live-fire training to find roosting and sharable residual habitat.

- Conduct hardwood midstory treatments within and around the project location to ensure the RCW standard of managed stability and recovery standards are met as defined in the 2003 RCW Guidelines. Priority management would target RCW cluster cores; and locations determined by RCW cluster activity status, group fitness, neighborhood analysis or TLWG prescriptions.
- Contracted personnel will conduct and provide the Endangered Species Branch RCW group fitness and activity information; data is contingent upon site access provided by DPTMS.
- The Forestry Branch will continue prescribed burns on a three-year rotation in accordance with the Fort Bragg Integrated Natural Resources Management Plan in and around the proposed project area emphasizing growing season burns.

2.3 Maintenance Phase Mitigation

Fort Bragg would annually request at minimum \$59,200 through environmental quality funding to monitor all RCW clusters within 1.25 miles of the action area.

3.0 Conclusion

This mitigation and monitoring plan for the construction and operation of the MPTR to support fielding the mobile protected firepower vehicle will guide the mitigation implementation process. Fort Bragg will conduct further NEPA analysis should the identified mitigation measures not adequately satisfy the intended purpose.

Enclosure 4



Roy Cooper
Governor

Pamela B. Cashwell
Secretary

September 20, 2022

Ginny Carswell
Department of the Army
Fort Bragg - Directorate of Public Works
AMIM-BGP-EM-M
Fort Bragg, NC 28310-5000

Re: SCH File # 23-E-0000-0027 Proposed project is for the Construction and Operation of a multipurpose training range at Fort Bragg. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours.

Dear Ginny Carswell:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act.

Attached to this letter are comments made by the agencies in the review of this document. If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

If you have any questions, please do not hesitate to contact me at (984) 236-0000.

Sincerely,

CRYSTAL BEST
State Environmental Review Clearinghouse

Attachments

Mailing
1301 Mail Service Center | Raleigh, NC 27699-1301



ncadmin.nc.gov

Location
116 West Jones St. | Raleigh NC 27603
984-236-0000 T



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary

To: Crystal Best
State Clearinghouse
NC Department of Administration

From: Lyn Hardison
Division of Environmental Assistance and Customer Service
Washington Regional Office

RE: 23-0027
Environmental Assessment/Finding of No Significant Impact
Proposed project is for the Construction and Operation of a multipurpose
training range at Fort Bragg.
Cumberland, Hoke and Moore Counties

Date: September 15, 2022

The Department of Environment Quality has reviewed the proposal for the referenced project. Based on the information provided, several of our agencies have identified permits that may be required and offered some valuable guidance. The comments are attached for the applicant's review.

The Department will continue to be available to assist the applicant with any questions or concerns.

Thank you for the opportunity to respond.

Attachments



North Carolina Department of Environmental Quality
217 West Jones Street | 1601 Mail Service Center | Raleigh, North Carolina 27699-1601
919.707.8600

FNSI-36

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MICHAEL SCOTT
Director



MEMORANDUM

TO: Michael Scott, Division Director through Sharon Brinkley

FROM: Drew Hammonds, Eastern District Supervisor - Solid Waste Section

DATE: September 15, 2022

SUBJECT: Review: SW 23-0027 – Cumberland County (EA/FONSI – US Dept of Army – Proposed project is for the construction and operation of a multipurpose training range at Ft. Bragg.)

The Division of Waste Management, Solid Waste Section (Section) has reviewed the documents submitted for the subject project in Cumberland County, NC. Based on the information provided in this document, the Section at this time does not see an adverse impact on the surrounding communities and likewise knows of no situations in the communities, which would affect this project.

It is recommended that during any land clearing, demolition and construction of this project, the US Department of the Army and/or its contractors would make every feasible effort to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of this project where suitable. **Any waste generated by and of the projects that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility permitted by the Division. The Section strongly recommends that the US Department of the Army require all contractors to provide proof of proper disposal for all generated waste to permitted facilities.**

Permitted solid waste management facilities are listed on the Division of Waste Management, Solid Waste Section portal site at: <https://deq.nc.gov/about/divisions/waste-management/waste-management-rules-data/solid-waste-management-annual-reports/solid-waste-permitted-facility-list>

Questions regarding solid waste management for this project should be directed to Mr. David Powell, Environmental Senior Specialist, Solid Waste Section, at (910) 433-3350.

cc: David Powell, Environmental Senior Specialist



North Carolina Department of Environmental Quality | Division of Waste Management
Fayetteville Regional Office | 225 Green Street, Suite 714 | Fayetteville, North Carolina 28301
910.433.3300

FNSI-37

State of North Carolina Department of Environmental Quality
 INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: FRO
 Project Number: 23-0027 Due Date: 09/15/2022
 County: Cumberland, Moore & Hoke

After review of this project, it has been determined that the DEQ permit(s) and/or approvals indicated may need to be obtained for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (Statutory time limit)
<input checked="" type="checkbox"/>	Permit to construct & operate wastewater treatment facilities, non-standard sewer system extensions & sewer systems that do not discharge into state surface waters.	Application 90 days before begins construction or award of construction contracts. On-site inspection may be required. Post-application technical conference usual.	30 days (90 days)
<input checked="" type="checkbox"/>	Permit to construct & operate, sewer extensions involving gravity sewers, pump stations and force mains discharging into a sewer collection system	Fast-Track Permitting program consists of the submittal of an application and an engineer's certification that the project meets all applicable State rules and Division Minimum Design Criteria.	30 days (N/A)
<input checked="" type="checkbox"/>	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begins activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
<input type="checkbox"/>	Water Use Permit	Pre-application technical conference usually necessary.	30 days (N/A)
<input type="checkbox"/>	Well Construction Permit	Complete application must be received, and permit issued prior to the installation of a groundwater monitoring well located on property not owned by the applicant, and for a large capacity (>100,000 gallons per day) water supply well.	7 days (15 days)
<input type="checkbox"/>	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
<input type="checkbox"/>	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100 thru 2Q.0300)	Application must be submitted, and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
<input checked="" type="checkbox"/>	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
<input type="checkbox"/>	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950	Please Note - The Health Hazards Control Unit (HHCU) of the N.C. Department of Health and Human Services, must be notified of plans to demolish a building, including residences for commercial or industrial expansion, even if no asbestos is present in the building.	60 days (90 days)
<input checked="" type="checkbox"/>	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres are to be disturbed. Plan must be filed with and approved by applicable Regional Office (Land Quality Section) at least 30 days before beginning activity. A NPDES Construction Stormwater permit (NCG01.0000) is also usually issued should design features meet minimum requirements. A fee of \$100 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
<input type="checkbox"/>	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable Stormwater conveyances and outlets.		(30 days)
<input type="checkbox"/>	Sedimentation and erosion control must be addressed in accordance with _____ Local Government's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable Stormwater conveyances and outlets.		Based on Local Program
<input type="checkbox"/>	Compliance with 15A NCAC 04B .0125 – Buffers Zones for Trout Waters shall have an undisturbed buffer zone 25 feet wide or of sufficient width to confine visible siltation within the twenty-five percent (25%) of the buffer zone nearest the land-disturbing activity, whichever is greater.		
<input type="checkbox"/>	Compliance with 15A NCAC 2H .0126 - NPDES Stormwater Program which regulates three types of activities: Industrial, Municipal Separate Storm Sewer System & Construction activities that disturb ≥1 acre.		30-60 days (90 days)
<input type="checkbox"/>	Compliance with 15A NCAC 2H 1000 -State Stormwater Permitting Programs regulate site development and post-construction stormwater runoff control. Areas subject to these permit programs include all 20 coastal counties, and various other counties and watersheds throughout the state.		45 days (90 days)

State of North Carolina Department of Environmental Quality
 INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: FRO
 Project Number: 23-0027 Due Date: 09/15/2022
 County: Cumberland, Moore & Hoke

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (Statutory time limit)
<input type="checkbox"/>	Mining Permit	On-site inspection usual. Surety bond filed with DEQ Bond amount varies with type mine and number of acres of affected land. Affected area greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
<input type="checkbox"/>	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to prepare plans, inspect construction, and certify construction is according to DEQ approved plans. May also require a permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of \$200.00 must accompany the application. An additional processing fee based on a percentage, or the total project cost will be required upon completion.	30 days (60 days)
<input type="checkbox"/>	Oil Refining Facilities	N/A	90-120 days (N/A)
<input type="checkbox"/>	Permit to drill exploratory oil or gas well	File surety bond of \$5,000 with DEQ running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to DEQ rules and regulations.	10 days N/A
<input type="checkbox"/>	Geophysical Exploration Permit	Application filed with DEQ at least 10 days prior to issue of permit. Application by letter. No standard application forms.	10 days N/A
<input type="checkbox"/>	State Lakes Construction Permit	Application fee based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property	15-20 days N/A
<input checked="" type="checkbox"/>	401 Water Quality Certification	Compliance with the T15A 02H .0500 Certifications are required whenever construction or operation of facilities will result in a discharge into navigable water as described in 33 CFR part 323.	60 days (130 days)
<input type="checkbox"/>	Compliance with Catawba, Goose Creek, Jordan Lake, Randleman, Tar Pamlico or Neuse Riparian Buffer Rules is required. Buffer requirements: http://deg.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/401-wetlands-buffer-permits/401-riparian-buffer-protection-program		
<input type="checkbox"/>	Nutrient Offset: Loading requirements for nitrogen and phosphorus in the Neuse and Tar-Pamlico River basins, and in the Jordan and Falls Lake watersheds, as part of the nutrient-management strategies in these areas. DWR nutrient offset information: http://deg.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-offset-information		
<input type="checkbox"/>	CAMA Permit for MAJOR development	\$250.00 - \$475.00 fee must accompany application	75 days (150 days)
<input type="checkbox"/>	CAMA Permit for MINOR development	\$100.00 fee must accompany application	22 days (25 days)
<input checked="" type="checkbox"/>	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
<input checked="" type="checkbox"/>	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
<input checked="" type="checkbox"/>	Plans and specifications for the construction, expansion, or alteration of a public water system must be approved by the Division of Water Resources/Public Water Supply Section prior to the award of a contract or the initiation of construction as per 15A NCAC 18C .0300 et. seq., Plans and specifications should be submitted to 1634 Mail Service Center, Raleigh, North Carolina 27699-1634. All public water supply systems must comply with state and federal drinking water monitoring requirements. For more information, contact the Public Water Supply Section, (919) 707-9100.		30 days
<input type="checkbox"/>	If existing water lines will be relocated during the construction, plans for the water line relocation must be submitted to the Division of Water Resources/Public Water Supply Section at 1634 Mail Service Center, Raleigh, North Carolina 27699-1634. For more information, contact the Public Water Supply Section, (919) 707-9100.		30 days
<input type="checkbox"/>	Plans and specifications for the construction, expansion, or alteration of the _____ water system must be approved through the _____ delegated plan approval authority. Please contact them at _____ for further information.		

State of North Carolina Department of Environmental Quality
 INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: FRO
 Project Number: 23-0027 Due Date: 09/15/2022
 County: Cumberland, Moore & Hoke

Other Comments (attach additional pages as necessary, being certain to comment authority)

Division	Initials	No comment	Comments	Date Review
DAQ	JDC	<input checked="" type="checkbox"/>		8/26/2022
DWR-WQROS (Aquifer & Surface)	KMB & KMB	<input type="checkbox"/>	&	8/22/2022
DWR-PWS	HLC	<input type="checkbox"/>	See above comments	8/25/2022
DEMLR (LQ & SW)	LHB	<input checked="" type="checkbox"/>		8/22/2022
DWM – UST	KEC	<input type="checkbox"/>	The UST Section, Fayetteville Regional Office, does not have record of a petroleum release in the general area of concern for this project number, nor are there any records of registered USTs. https://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=7dd59be2750b40bebefa49fc383f688	8/19/22
Other Comments		<input type="checkbox"/>		/ /

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

- | | | |
|---|--|--|
| <input type="checkbox"/> Asheville Regional Office
2090 U.S. 70 Highway
Swannanoa, NC 28778-8211
Phone: 828-296-4500
Fax: 828-299-7043 | <input checked="" type="checkbox"/> Fayetteville Regional Office
225 Green Street, Suite 714,
Fayetteville, NC 28301-5043
Phone: 910-433-3300
Fax: 910-486-0707 | <input type="checkbox"/> Mooreville Regional Office
610 East Center Avenue, Suite 301,
Mooreville, NC 28115
Phone: 704-663-1699
Fax: 704-663-6040 |
| <input type="checkbox"/> Raleigh Regional Office
3800 Barrett Drive,
Raleigh, NC 27609
Phone: 919-791-4200
Fax: 919-571-4718 | <input type="checkbox"/> Washington Regional Office
943 Washington Square Mall,
Washington, NC 27889
Phone: 252-946-6481
Fax: 252-975-3716 | <input type="checkbox"/> Wilmington Regional Office
127 Cardinal Drive Ext.,
Wilmington, NC 28405
Phone: 910-796-7215
Fax: 910-350-2004 |
| | <input type="checkbox"/> Winston-Salem Regional Office
450 Hanes Mill Road, Suite 300,
Winston-Salem, NC 27105
Phone: 336-776-9800
Fax: 336-776-9797 | |

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MICHAEL SCOTT
Director



Date: August 29, 2022

To: Michael Scott, Director
Division of Waste Management

Through: Janet Macdonald
Inactive Hazardous Sites Branch

From: Katie C Tatum
Inactive Hazardous Sites Branch

Subject: NEPA Project # 23-0027, Department of Army, Cumberland County, North Carolina

The Superfund Section has reviewed the proximity of sites under its jurisdiction to the Department of Army project. Proposed project is for the Construction and Operation of a multipurpose training range at Fort Bragg. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours.

No Superfund Section sites were identified within one mile of the project as shown on the attached reports.

Please contact Janet Macdonald at 919.707.8349 if you have any questions concerning the Superfund Section review portion of this SEPA/NEPA inquiry.



North Carolina Department of Environmental Quality | Division of Waste Management
217 West Jones Street | 1646 Mail Service Center | Raleigh, North Carolina 27699-1646
919.707.8200

FNSI-41



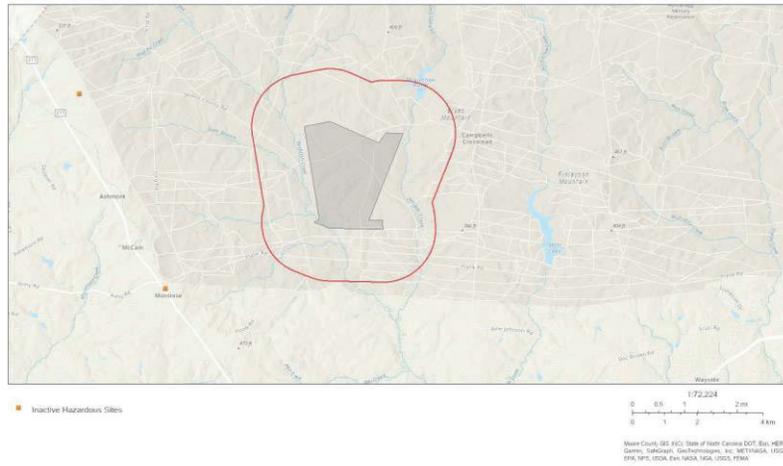
Area of Interest (AOI) Information

Cumberland County

NEPA project 23-0027

Area : 8,259.54 acres

Aug 29 2022 9:55:17 Eastern Daylight Time



Superfund Section Only
Cumberland County NEPA Project 23-0027
Map 1: Location of Preferred Alternative

Summary

Name	Count	Area(acres)	Length(mi)
Certified DSCA Sites	0	N/A	N/A
Federal Remediation Branch Sites	0	N/A	N/A
Inactive Hazardous Sites	0	N/A	N/A
Pre-Regulatory Landfill Sites	0	N/A	N/A
Brownfields Program Sites	0	N/A	N/A

Superfund Section Only
Cumberland County NEPA Project 23-0027
Map 2: Communication and Electric

Summary

Name	Count	Area(acres)	Length(mi)
Certified DSCA Sites	0	N/A	N/A
Federal Remediation Branch Sites	0	N/A	N/A
Inactive Hazardous Sites	0	N/A	N/A
Pre-Regulatory Landfill Sites	0	N/A	N/A
Brownfields Program Sites	0	N/A	N/A

Department of Environmental Quality Project Review Form

Project Number: 23-E-0000-0027

**County: Cumberland,
Moore & Hoke**

Date Received: 8-8-2022

Due Date: 9-15-2022

Project Description: *Environmental Assessment/Finding of No Significant Impact - Proposed project is for the Construction and Operation of a multipurpose training range at Fort Bragg. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours.*

This Project is being reviewed as indicated below:

Regional Office	Regional Office Area	In-House Review
<input type="checkbox"/> Asheville	<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Fayetteville	<input checked="" type="checkbox"/> DWR	<input type="checkbox"/> Parks & Recreation
<input type="checkbox"/> Mooresville	<input checked="" type="checkbox"/> DWR - Public Water	<input checked="" type="checkbox"/> Waste Mgmt
<input type="checkbox"/> Raleigh	<input checked="" type="checkbox"/> DEMLR (LQ & SW)	<input checked="" type="checkbox"/> Water Resources Mgmt (Public Water, Planning & Water Quality Program)
<input type="checkbox"/> Washington	<input checked="" type="checkbox"/> DWM	<input type="checkbox"/> DWR-Transportation Unit
<input type="checkbox"/> Wilmington		<input type="checkbox"/> Coastal Management
<input type="checkbox"/> Winston-Salem		<input type="checkbox"/> Marine Fisheries
		<input type="checkbox"/> Military Affairs
		<input type="checkbox"/> DMF-Shellfish Sanitation
		<input checked="" type="checkbox"/> Wildlife <u>Gabriela</u>
		<input type="checkbox"/> Wildlife/DOT

Manager Sign-Off/Region:	Date:	In-House Reviewer/Agency: Gabriela Garrison/NCWRC
--------------------------	-------	---

Response (check all applicable)

- No objection to project as proposed.
 No Comment
- Insufficient information to complete review
 Other (specify or attach comments)

If you have any questions, please contact:

Lyn Hardison at lyn.hardison@ncdenr.gov or (252) 948-3842
943 Washington Square Mall Washington NC 27889
Courier No. 16-04-01

Department of Environmental Quality Project Review Form

Project Number: 23-E-0000-0027

**County: Cumberland,
Moore & Hoke**

Date Received: 8-8-2022

Due Date: 9-15-2022

Project Description: *Environmental Assessment/Finding of No Significant Impact - Proposed project is for the Construction and Operation of a multipurpose training range at Fort Bragg. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours.*

This Project is being reviewed as indicated below:

Regional Office	Regional Office Area	In-House Review	
<input type="checkbox"/> Asheville	<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Air Quality	<input type="checkbox"/> Coastal Management
<input checked="" type="checkbox"/> Fayetteville	<input checked="" type="checkbox"/> DWR	<input type="checkbox"/> Parks & Recreation	<input type="checkbox"/> Marine Fisheries
<input type="checkbox"/> Mooresville	<input checked="" type="checkbox"/> DWR - Public Water	<input checked="" type="checkbox"/> Waste Mgmt	<input type="checkbox"/> Military Affairs
<input type="checkbox"/> Raleigh	<input checked="" type="checkbox"/> DEMLR (LQ & SW)	<input checked="" type="checkbox"/> Water Resources Mgmt (Public Water, Planning & Water Quality Program)	<input type="checkbox"/> DMF-Shellfish Sanitation
<input type="checkbox"/> Washington	<input checked="" type="checkbox"/> DWM	<input type="checkbox"/> DWR-Transportation Unit	<input checked="" type="checkbox"/> Wildlife <u>Gabriela</u>
<input type="checkbox"/> Wilmington			<input type="checkbox"/> Wildlife/DOT
<input type="checkbox"/> Winston-Salem			
Manager Sign-Off/Region:		Date: September 9, 2022	In-House Reviewer/Agency: DWR/WRM David Wainwright

Response (check all applicable)

- No objection to project as proposed. No Comment
 Insufficient information to complete review Other (specify or attach comments)

If you have any questions, please contact:

**Lyn Hardison at lyn.hardison@ncdenr.gov or (252) 948-3842
943 Washington Square Mall Washington NC 27889
Courier No. 16-04-01**

Department of Environmental Quality Project Review Form

Project Number: 23-E-0000-0027

**County: Cumberland,
Moore & Hoke**

Date Received: 8-8-2022

Due Date: 9-15-2022

Project Description: *Environmental Assessment/Finding of No Significant Impact - Proposed project is for the Construction and Operation of a multipurpose training range at Fort Bragg. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours.*

This Project is being reviewed as indicated below:

Regional Office	Regional Office Area	In-House Review	
<input type="checkbox"/> Asheville	<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Air Quality	<input type="checkbox"/> Coastal Management
<input checked="" type="checkbox"/> Fayetteville	<input checked="" type="checkbox"/> DWR	<input type="checkbox"/> Parks & Recreation	<input type="checkbox"/> Marine Fisheries
<input type="checkbox"/> Mooresville	<input checked="" type="checkbox"/> DWR - Public Water	<input checked="" type="checkbox"/> Waste Mgmt	<input type="checkbox"/> Military Affairs
<input type="checkbox"/> Raleigh	<input checked="" type="checkbox"/> DEMLR (LQ & SW)	<input checked="" type="checkbox"/> Water Resources Mgmt (Public Water, Planning & Water Quality Program)	<input type="checkbox"/> DMF-Shellfish Sanitation
<input type="checkbox"/> Washington	<input checked="" type="checkbox"/> DWM	<input type="checkbox"/> DWR-Transportation Unit	<input checked="" type="checkbox"/> Wildlife <u>Gabriela</u>
<input type="checkbox"/> Wilmington			<input type="checkbox"/> Wildlife/DOT
<input type="checkbox"/> Winston-Salem			
Manager Sign-Off/Region:		Date: 9/15/22	In-House Reviewer/Agency: Melodi Deaver, Hazardous Waste Section

Response (check all applicable)

- No objection to project as proposed.
 No Comment
- Insufficient information to complete review
 Other (specify or attach comments)

If you have any questions, please contact:

Lyn Hardison at lyn.hardison@ncdenr.gov or (252) 948-3842
943 Washington Square Mall Washington NC 27889
Courier No. 16-04-01

Control No.: 23-E-0000-0027

Date Received: 8/18/2022

County.: CUMBERLAND, MOORE,
HOKE

Agency Response: 9/19/2022

Review Closed: 9/19/2022

LYN HARDISON
CLEARINGHOUSE COORDINATOR
DEPT OF ENVIRONMENTAL QUALITY

Project Information

Type: National Environmental Policy Act ironmental Assessment/Finding of No
Significant Impact

Applicant: Department of the Army

Project Desc.: Proposed project is for the Construction and Operation of a multipurpose training range at Fort
Bragg. Construction and subsequent proposed project operation and maintenance would
occur throughout the year at all hours.

As a result of this review the following is submitted:

No Comment

Comments Below

Documents Attached

Reviewed By: LYN HARDISON

Date: 9/19/2022

Control No.: 23-E-0000-0027

Date Received: 8/18/2022

County.: CUMBERLAND, MOORE,
HOKE

Agency Response: 9/19/2022

Review Closed: 9/19/2022

JINTAO WEN
CLEARINGHOUSE COORDINATOR
DPS - DIV OF EMERGENCY MANAGEMENT

Project Information

Type: National Environmental Policy Act ironmental Assessment/Finding of No
Significant Impact

Applicant: Department of the Army

Project Desc.: Proposed project is for the Construction and Operation of a multipurpose training range at Fort
Bragg. Construction and subsequent proposed project operation and maintenance would
occur throughout the year at all hours.

As a result of this review the following is submitted:

No Comment

Comments Below

Documents Attached

From the information provided, portion of the proposed project occurs within a designated floodplain. Please ensure regulatory compliance with EO 11988 and 44 CFR for the floodplain management.

Reviewed By: JINTAO WEN

Date: 9/6/2022

FNSI-50

Control No.: 23-E-0000-0027

Date Received: 8/18/2022

County.: CUMBERLAND, MOORE,
HOKE

Agency Response: 9/19/2022

Review Closed: 9/19/2022

JEANNE STONE
CLEARINGHOUSE COORDINATOR
DEPT OF TRANSPORTATION

Project Information

Type: National Environmental Policy Act ironmental Assessment/Finding of No
Significant Impact

Applicant: Department of the Army

Project Desc.: Proposed project is for the Construction and Operation of a multipurpose training range at Fort
Bragg. Construction and subsequent proposed project operation and maintenance would
occur throughout the year at all hours.

As a result of this review the following is submitted:

No Comment

Comments Below

Documents Attached

Reviewed By: JEANNE STONE

Date: 8/18/2022



Roy Cooper
Governor

Pamela B. Cashwell
Secretary

September 28, 2022

Ginny Carswell
Department of the Army
Fort Bragg - Directorate of Public Works
AMIM-BGP-EM-M
Fort Bragg, NC 28310-5000

Re: SCH File # 23-E-0000-0027 Proposed project is for the Construction and Operation of a multipurpose training range at Fort Bragg. Construction and subsequent proposed project operation and maintenance would occur throughout the year at all hours.

Dear Ginny Carswell:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act.

Attached to this letter are comments made by the agencies in the review of this document. If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

If you have any questions, please do not hesitate to contact me at (984) 236-0000.

Sincerely,

CRYSTAL BEST
State Environmental Review Clearinghouse

Attachments

Mailing
1301 Mail Service Center | Raleigh, NC 27699-1301



ncadmin.nc.gov

Location
116 West Jones St. | Raleigh NC 27603
984-236-0000 T

FNSI-52



**North Carolina Department of Natural and Cultural Resources
State Historic Preservation Office**

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary D. Reid Wilson

Office of Archives and History
Deputy Secretary, Darin J. Waters, Ph.D.

September 28, 2022

MEMORANDUM

TO: Crystal Best crystal.best@doa.nc.gov
North Carolina State Clearinghouse
Department of Administration

FROM: Ramona Bartos *RMB for Ramona M. Bartos*

SUBJECT: Construct multipurpose training range, Fort Bragg (23-E-0000-0027), ER 22-2072

Thank you for your email of August 18, 2022, concerning the above project. We apologize for the delay in our response and any inconvenience it may have caused.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no objection to the FONSI.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, Environmental Review Coordinator, at 919-814-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.