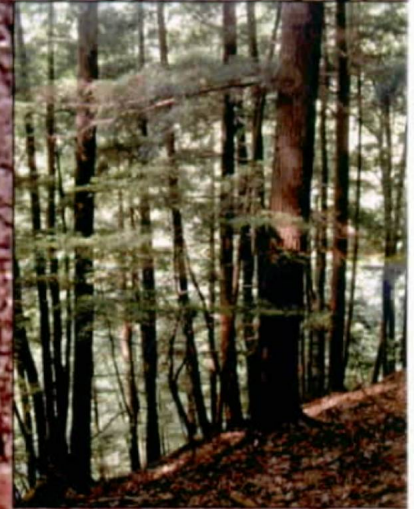
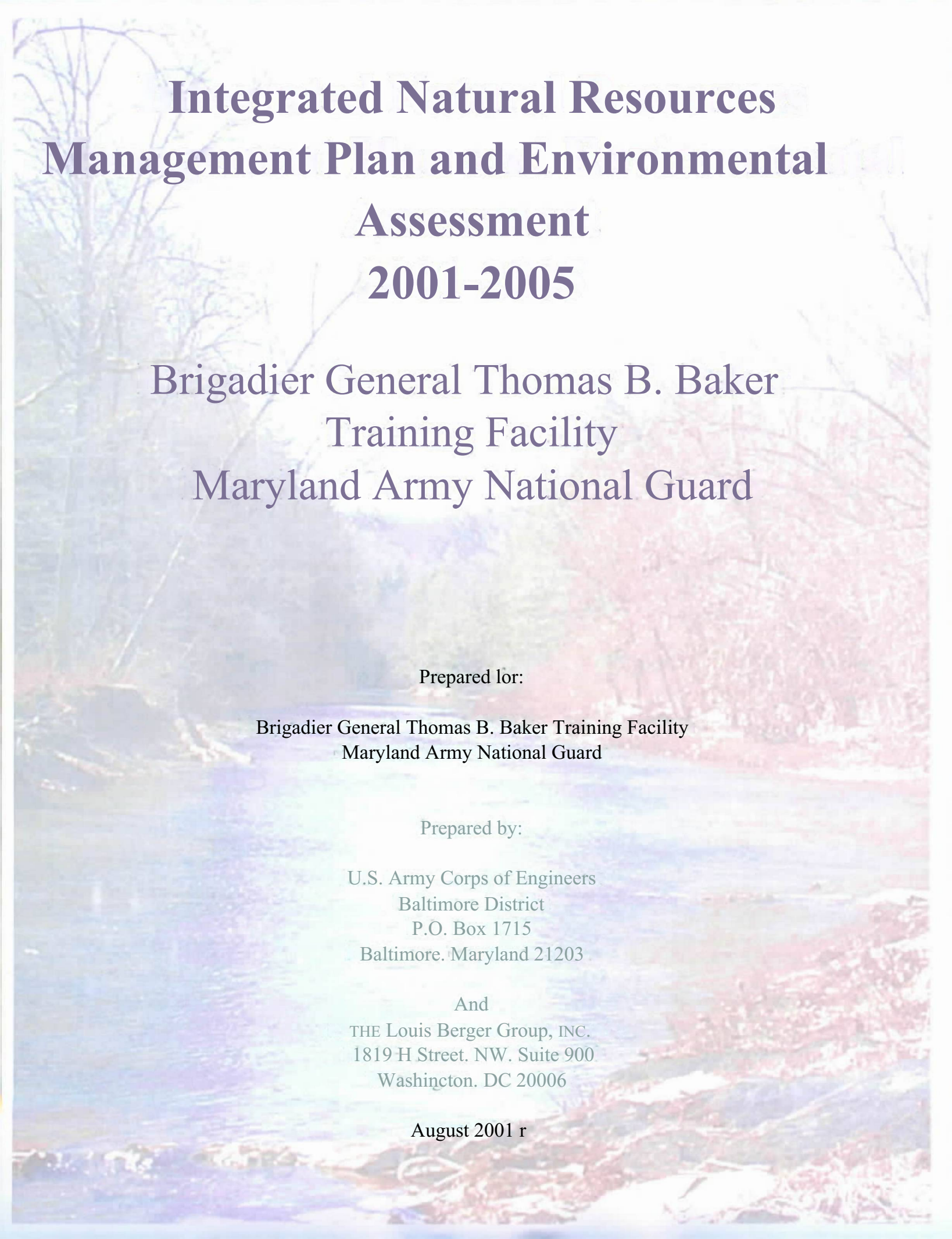


# Integrated Natural Resources Management Plan and Environmental Assessment 1991-2005

August 2001







# **Integrated Natural Resources Management Plan and Environmental Assessment 2001-2005**

**Brigadier General Thomas B. Baker  
Training Facility  
Maryland Army National Guard**

Prepared for:

**Brigadier General Thomas B. Baker Training Facility  
Maryland Army National Guard**

Prepared by:

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Washington, DC 20006**

**August 2001 r**



**Brigadier General Thomas B. Baker Training Facility  
Allegany and Washington Counties, Maryland  
Integrated Natural Resources Management Plan  
2001-2005**

Signature Page

This Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S.C. §670a et seq.), Army Regulation 200-3, and the Executive Summary and Scope within this plan. It has set appropriate and adequate guidelines for the conservation, protection and management of natural resources on the Brigadier General Thomas B. Baker Training Facility.

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**FINDING OF NO SIGNIFICANT IMPACT  
(FNSI)**

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## **Finding of No Significant Impact**

### **For Implementing an Integrated Natural Resources Management Plan For The Brigadier General Thomas B. Baker Training Facility (TBBTF)**

In accordance with the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508) for implementing the procedural provisions of the National Environmental Policy Act (42 U.S.C. 4321 et seq.) and Army Regulation 200-2 (Environmental Effects of Army Actions), the Maryland Army National Guard (MDARNG) has conducted an Environmental Assessment (EA) of the potential effects associated with implementing an Integrated Natural Resources Management Plan (INRMP) at TBBTF. This INRMP has been prepared in accordance with the provisions of the Sikes Act (16 U.S.C 670a et seq.) and Army Regulation 200-3 (Natural Resources-Land, Forest and Wildlife Management).

#### **A. Description of Proposed Action and Alternatives**

**Proposed Action.** The MDARNG proposes to implement an INRMP, which supports the management of natural resources at TBBTF. The purpose of the proposed action is to carry out the set of resource-specific management measures developed in the INRMP. This enables TBBTF to effectively manage the use and condition of natural resources located on the installation and protects the natural setting primarily for training purposes. Implementation of the proposed action will support the MDARNG's ongoing need to train soldiers in a realistic natural setting while meeting other mission and community support requirements, practicing sound resource stewardship and complying with environmental policies and regulations.

The proposed action supports an ecosystem approach to natural resources management and includes specific resource management measures to be undertaken on TBBTF. The proposed action focuses on a 5-year planning period, which is consistent with the time frame for the management measures described in the INRMP. This planning period will begin in the 2001 upon approval of the document. The plan supports an adaptive approach to natural resources management and may require additional environmental analyses if management approaches are modified, or as new management measures are developed over the long-term (i.e., beyond 5 years).

**Alternatives.** The development of proposed management measures for the INRMP included a screening analysis of resource-specific alternatives. The screening analysis involved the use of accepted criteria, standards, and guidelines, when available, and best professional judgement, to identify practices for achieving TBBTF's natural resource management objectives. The outcome of the screening analysis led to the development of the proposed action as described above. Consistent with the intent of NEP A, the screening process focused on identifying a range of reasonable resource-specific management alternatives and, from that, developing a plan that could be implemented, as a whole, in the foreseeable future. Management alternatives deemed to be infeasible were not analyzed further. As a result of the screening process, the EA, made an integral part of the INRMP, formally addresses two alternatives, the proposed action (i.e., implementation of the INRMP) and the No Action alternative.



Implementation of the No Action alternative means that the proposed management measures set forth in the INRMP will not be implemented. Current management measures for natural resources will remain in effect, and existing conditions will continue. This document refers to the continuation of existing (i.e., baseline) conditions of the affected environment, without implementation of the proposed action, as the No Action alternative. Inclusion of a No Action alternative is prescribed by CEQ regulations and serves as a benchmark against which the proposed action can be evaluated.

## **B. Environmental Analysis**

The EA, which is incorporated by reference into this Finding of No Significant Impact (FNSI), examines potential effects of the proposed action and the No Action alternative on resources and areas of environmental concern that could be affected by implementing the INRMP. These include climate; air quality; noise; topography; geology; soils; water resources; wetlands; aquatic habitat; riparian habitat; terrestrial ecosystems; sensitive or significant habitats; fauna; endangered, threatened, and rare species; cultural resources; land use; facilities; hazardous and toxic materials; socioeconomic resources; and environmental justice. Implementation of the proposed action would result in no effects, and short- and long-term beneficial effects on identified resources and areas of environmental concern.

Based on the results of the EA, it is determined that implementation of the proposed action will have no significant direct, indirect or cumulative impacts on the quality of the natural or human environment. Implementation of the INRMP is expected to improve existing conditions at TBBTF, as shown by the potential for beneficial effects. The proposed action will enable TBBTF over time to achieve its goal of maintaining ecosystem viability and ensure sustainability of desired military training area conditions. Based on the EA there will be no significant environmental impacts resulting from implementation of the proposed action, so an Environmental Impact Statement is not required and will not be prepared.

## **C. Regulations**

There are no indications that implementation of this action will violate any federal, state, or local environmental laws or regulations. The proposed action would not violate the National Environmental Policy Act (42 USC § 4321 to 4370e), its regulations as promulgated by the Council on Environmental Quality (40 CFR Parts 1500-1508), Army Regulation 200-2 "Environmental Effects of Army Actions" or any other federal, state, or local environmental laws or regulations. The EA documents the status of project compliance with applicable federal environmental statutes and executive orders.

## **D. Public Review and Comment**

Notice of Availability of the Draft INRMP and EA for a public review and comment period of 30 days was published in the Hancock News (Hancock, MD), Frederick Post (Frederick, MD), Herald-Mail (Hagerstown, MD), and the Cumberland Times (Cumberland, MD). Copies of the newspaper ads announcing the notice of availability are presented in Appendix E of the INRMP and EA. The draft INRMP and EA was made available for public review at the Hancock Library, The Washington County Free Library, and the Allegany County Library. Any



comments received on the draft document were considered for inclusion in the Final INRMP and EA. Agency responses to review of the Draft INRMP and EA are presented in Appendix F of the INRMP and EA.

The final INRMP and EA will be made available for public review at the following locations:

Hancock Library  
290 Park Road  
Hancock, Maryland

The Washington County Free Library  
100 South Potomac Street  
Hagerstown, Maryland


Allegany County Library  
31 Washington Street  
Cumberland, Maryland

Interested parties are invited to review the final INRMP and EA and submit written comments before close of the public review period. Written comments should be sent to Mr. Shannon Cauley, The Louis Berger Group, Inc., 1819 H Street NW, Suite 900, Washington, DC 20006. Comments can be faxed to 202-293-0787. Questions or requests for more information should be directed to Mr. Shannon Cauley at 202-331-7775 (Ext. 474).

#### **F. FINDING OF NO SIGNIFICANT IMPACT**

A careful review of the Environmental Assessment has concluded that the implementation of INRMP for TBBTF will not have any significant adverse impacts on the quality of the existing natural or human environment. The requirements of the National Environmental Policy Act and the Council on Environmental Quality regulations have been satisfied and an Environmental Impact Statement will not be prepared.

August 23, 2001  
Date "

  
RICHARD O. MURPHY  
Colonel, Chief of Environmental Programs  
National Guard Bureau



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## **EXECUTIVE SUMMARY**

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## ***EXECUTIVE SUMMARY AND SCOPE***

The 1,194 acre Brigadier General Thomas B. Baker Training Facility (TBBTF) is an Army National Guard (ARNG) training facility located in western Maryland. TBBTF is leased from the Maryland Department of Natural Resources by the Maryland Military Department for the Maryland Army National Guard (MDARNG). TBBTF specializes in supporting military training for land navigation, mountaineering, and light infantry exercises. The facility provides centralized training and reduces the need for travel to out-of-state training areas. This results in a significant increase in productive training time and reduced transportation costs.

The purpose of this Integrated Natural Resources Management Plan (INRMP) is to guide the natural resources management program on TBBTF from 2001 through 2005 and beyond. MDARNG anticipates continued and somewhat increased use of TBBTF during the next five years, therefore, the MDARNG must manage TBBTF to preserve and enhance its carrying capacity. The INRMP will allow TBBTF to achieve its goals to ensure sustainability of military training areas necessary to implement the military mission while maintaining ecosystem viability. In addition, the INRMP will ensure that natural resources conservation measures and MDARNG activities on TBBTF are integrated and consistent with Federal land stewardship requirements. The INRMP focuses on the implementation of goals, objectives and guidelines for sound natural resources management based on an ecosystem management approach, while demonstrating the interrelationships between the military mission and natural resources management. This INRMP supports the military mission at TBBTF, while ensuring sound land management, and compliance with all relevant regulations.

The plan also contains the necessary documentation for compliance with the National Environmental Policy Act (NEPA), which requires Federal agencies to consider the environmental consequences of major proposed actions. In the form of an Environmental Assessment (EA), the NEPA documentation analyzes the potential effects of the proposed action to implement the facility INRMP.

The Sikes Act (16 USC §670a et seq.), as amended by the Sikes Improvement Act of 1997, directs the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate the program each of the military departments is directed to prepare and implement INRMPs for their installations. It is Army policy and NGB guidance that all INRMPs prepared for ARNG installations be prepared in a manner consistent with the standards set by the Sikes Act. Consistent with the use of military installations to ensure the preparedness of the Armed Forces each INRMP, to the extent appropriate and applicable, shall provide for:

- fish and wildlife management, land management, forest management, and fish- and wildlife- oriented recreation;
- fish and wildlife habitat enhancement or modifications;
- wetland protection, enhancement, and restoration;

- integration of, and consistency among, the various activities conducted under the plan;
- establishment of specific natural resources management goals and objectives and time frames for proposed action;
- sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- enforcement of applicable natural resources laws; and
- no net loss in the capability of military lands to support the military mission.

Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*, provides ARNG guidance and procedures for complying with NEPA and sets forth policy for integrating environmental considerations into ARNG planning and decision making. AR 200-2 directs installations to integrate environmental analyses and documentation as much as practicable with other environmental reviews, laws, and Executive Orders. The regulation specifically identifies the INRMP as a type of document that should be reviewed for environmental considerations prior to implementation. Therefore, the requirements of AR 200-2 must be addressed in the context of environmentally assessing the potential effects of a proposed action to implement an INRMP once it is developed.

INRMPs are developed in accordance with AR 200-3, *Natural Resources Land, Forest, and Wildlife Management*, which provides ARNG guidance and procedures for protection of natural resources, including conservation, management, and restoration. The regulation sets forth policy, procedures, and responsibilities for the conservation, management, and restoration of land and natural resources in a manner consistent with the military mission and national policies. AR 200-3 states that all natural resources management plans require some level of environmental review and the appropriate level of documentation will be determined based upon requirements set forth in NEPA and AR 200-2 on an installation by installation basis. AR 200-3 further states that it is ARNG policy to integrate environmental reviews concurrently with other ARNG planning and decision-making actions to avoid delays in mission accomplishments. The INRMP Policy Memorandum (HQDA, 1997) states that with regard to NEPA requirements, implementation of the INRMP shall serve as the proposed action and NEPA documentation should be scoped to address appropriate alternatives and issues.

This INRMP ensures that environmental considerations are integral to the mission and comply with AR 200-2 and AR 200-3 by integrating the INRMP and NEPA compliance documentation. The focus of the INRMP is on the management of natural resources on TBBTF. The management measures were developed based on the current conditions of the resources, and the anticipated military mission and activities. The intent of the INRMP is to guide natural resources management at TBBTF for the next five years and provide a solid foundation for natural resources management beyond five years.

The scope of the EA analysis is based on identifying, documenting, and evaluating potential effects of implementing the INRMP. The EA evaluates the effects of implementing the preferred alternative (implementation of the INRMP) and the No Action alternative. The no action alternative maintains the status quo with no new

management measures proposed. The development of the management measures presented as the preferred alternative in the INRMP involved an intense screening analysis of resource specific management alternatives. The screening analysis involved the use of criteria, standards, guidelines, and best professional judgement to identify management practices for achieving TBBTF natural resources management objectives. The process focused on considering a reasonable range of resource specific management alternatives and, from those, developing an executable plan. Alternatives deemed infeasible were eliminated from detailed analysis (Section 5.0). The proposed action resulted from the screening analysis. Application of the screening analysis in the development of the proposed action resulted in the adoption of the management measures presented in the INRMP and eliminated the need to define and evaluate hypothetical alternatives to plan implementation.

The potential environmental effects of implementing the management measures presented in the INRMP (the preferred alternative) and the no action alternative are summarized in Table 7-1. Based on the environmental analysis, no significant effects would result from implementing the INRMP. Additionally, no adverse effects would be expected. Potential consequences of implementing the INRMP would result in beneficial effects or no effects on the individual resource areas.

## **SUMMARY**

This INRMP reflects the commitment of the ARNG to conserve, protect, and enhance the natural resources necessary to provide realistic training for units of the MDARNG. The purpose and objective is to help guide TBBTF towards achieving natural resources management goals, meeting mission requirements, and complying with environmental policies and regulations. In addition, the requirement for NEPA analysis associated with the implementation of the plan is incorporated, in the form of an EA, into the INRMP. The document includes a comprehensive description, evaluation, and assessment of environmental conditions and natural resources at TBBTF.

Based on the results of the EA, it is determined that implementation of the proposed action will have no significant direct, indirect or cumulative impacts on the quality of the natural or human environment. Implementation of the INRMP is expected to improve existing conditions at TBBTF, as shown by the potential for beneficial effects. The proposed action will enable TBBTF over time to achieve its goal of maintaining ecosystem viability and ensure sustainability of desired military training area conditions. Based on the EA there will be no significant environmental impacts resulting from implementation of the proposed action, so an Environmental Impact Statement is not required and will not be prepared.

An ecosystem approach was used to develop the management measures in this INRMP for each of the resource areas. Implementation of the management measures will help to ensure that the ecological integrity of training lands and associated biological communities will be maintained, protected and enhanced. In addition, the natural

resources management measures described in the plan will protect ecosystems on TBBTF from damage or degradation and identify and restore previously degraded habitats.

Several new initiatives, in addition to the continued implementation of ongoing management practices, have been prescribed in the INRMP for the management of natural resources on TBBTF, examples of which include: the development of a proactive approach to the management of invasive species on TBBTF based on the assessment of baseline conditions and the development of a comprehensive plan for their management and control; establishment of a water monitoring program; development and posting of fact sheets addressing environmental issues on TBBTF; continued restriction of training activities within a 100-meter buffer to Sideling Hill Creek or within areas designated as the Restricted Use Area; restriction of the crossing of Sideling Hill Creek during training activities to existing bridges or the designated Sideling Hill Creek crossing; implementation of best management practices at the designated Sideling Hill Creek crossing to reduce potential for adverse effects to sensitive species or water quality and to reduce the potential for the spread of invasive species associated with use of the crossing; providing protection to Federal and state listed sensitive species on TBBTF by limiting training activities in sensitive habitats or in areas where species are known to occur; and full implementation of Integrated Pest Management practices presented in the State plan on TBBTF. These management initiatives and practices in combination with other practices prescribed in the INRMP provide the basis for sound natural resources management on TBBTF by providing protection to ecosystems from damage or degradation and by providing mechanisms for the enhancement or restoration of previously degraded habitats.

This INRMP is intended to direct natural resources management at TBBTF over the next five years. Command support is essential for the implementation of this INRMP and is required for many of the natural resources management projects presented.



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## **1.0 - INTRODUCTION**

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## **1.0 INTRODUCTION**

The purpose of this Integrated Natural Resources Management Plan (INRMP) is to serve as an effective installation tool for managing natural resources consistent with mission goals. This INRMP is the adaptive plan for managing natural resources, supporting consistency with the military mission while protecting and enhancing resources for multiple use, sustainable yield, and biological diversity. This INRMP will ensure that natural resources conservation measures and Maryland Army National Guard (MDARNG) activities on mission land are integrated and are consistent with Federal stewardship requirements.

The Sikes Act (16 USC §670 et seq.) as amended by the Sikes Improvement Act of 1997 directs the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations. To facilitate the program, each of the military departments is directed to prepare and implement INRMPs for their installations. Thomas B. Baker Training Facility (TBBTF) is not a federally owned property so the provisions of the Sikes Act do not apply to the installation. However, it is Army policy and National Guard Bureau (NGB) guidance that all INRMPs prepared for ARNG installations be prepared in a manner consistent with the standards set by the Sikes Act. Consistent with the use of military installations to ensure the preparedness of the Armed Forces each INRMP, to the extent appropriate and applicable, shall provide for:

- fish and wildlife management, land management, forest management, and fish- and wildlife- oriented recreation;
- fish and wildlife habitat enhancement or modifications;
- wetland protection, enhancement, and restoration;
- integration of, and consistency among, the various activities conducted under the plan;
- establishment of specific natural resources management goals and objectives, and time frames for proposed actions;
- sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- enforcement of applicable natural resources laws; and
- no net loss in the capability of military lands to support the military mission.

This INRMP integrates all aspects of natural resources management with TBBTF's mission (outlined in Section 2), and serves as the primary tool for managing ecosystems while ensuring the successful accomplishment of the military mission at the highest possible levels of efficiency. The INRMP is a guide for the management and stewardship of all natural resources present on TBBTF. A multiple-use approach will be implemented to allow for the presence of mission-oriented activities, as well as environmental quality through the efficient management of natural resources.

The INRMP provides MDARNG with a description of the TBBTF (also referred to as the Lil Aaron Strauss Wilderness Area), information about the surrounding physical and biotic environment, and an assessment of impacts to natural resources as a result of mission activities. The INRMP recommends various management practices, in compliance with

Federal, state, and local standards, designed to mitigate negative impacts and enhance the positive effects of TBBTF's mission on local ecosystems.

## **1.1 GOALS AND POLICIES**

The goal of this INRMP is to guide the natural resources management program at TBBTF from 2001 through 2005 and to provide a solid foundation from which to build the program beyond 2005. The INRMP allows TBBTF to achieve its goals to ensure the sustainability of desired military training area conditions and maintain ecosystem viability. In addition, the INRMP will ensure that natural resources conservation measures and MDARNG activities on TBBTF land are integrated and are consistent with Federal stewardship requirements.

The goals of natural resources management at TBBTF include the following:

- maintain ecosystem viability and ensure the sustainability of desired military training area conditions;
- maintain, protect, and improve ecological integrity;
- protect and enhance biological communities, particularly sensitive, rare, threatened, and endangered species;
- protect ecosystems and their components from unacceptable damage or degradation;
- identify and restore degraded habitats; and
- protect cultural resources.

Specific management practices identified in this INRMP have been developed to enhance and maintain biological diversity on TBBTF. Specifically, management practices should: (1) minimize habitat fragmentation and promote the natural pattern and connectivity of habitats; (2) protect native species and discourage exotic invasive species; (3) protect rare and ecologically important species; (4) protect unique or sensitive environments; (5) maintain or mimic natural processes; (6) protect genetic diversity; (7) restore ecosystems, communities, and species; and (8) monitor biodiversity impacts. Each of the management strategies described should be monitored so modifications can be made during implementation as conditions change.

The natural resources management program at TBBTF must remain flexible if it is to obtain long-term success. The program will achieve and maintain flexibility by incorporating adaptive management techniques. Through adaptive management, new information from either monitoring data or scientific literature, will be used to evaluate the success of in-place management measures. The information will then be used to determine the necessary changes in the management approach to ensure the continued success of the program. The natural resources program may also be required to adapt to changes in military mission and legal requirements.

The ability to achieve the goals of the INRMP depends on the health and condition of the natural resources. The success of the military mission at TBBTF depends on the condition of the natural resources, as well. Protecting the ecological and biological integrity of

training lands ensures that the environmental condition of training lands continues to provide the vegetation, soil, and water resources necessary for realistic military training.

## **1.2 BACKGROUND**

### **1.2.1 Location**

TBBTF is located in Maryland in Allegany and Washington Counties on the Potomac River, approximately 100 miles west of Baltimore City and 100 miles northwest of Washington, DC. Hancock, Maryland is located 16 miles to the east of TBBTF (Figure 1-1). The training area can be accessed by heading west from Hancock on 1-68 to Exit 78 to Woodmont Road. Follow Woodmont Road south for approximately nine miles to the entrance of the training site. TBBTF can also be accessed by following Orleans Road south from 1-68.

### **1.2.2 Acreage and Acquisition**

TBBTF consists of 1,194 acres of predominantly woodland; approximately 48 acres of the facility is currently cleared. Approximately 865 acres of TBBTF are located to the west of Sideling Hill Creek in Allegany County and leased to MDARNG by the Maryland Department of Natural Resources (DNR) under a lease agreement signed on March 11, 1991. The 25-year lease agreement expires on March 10, 2016.

The remaining 329 acres of the facility are located to the east of Sideling Hill Creek in Washington County. The area on the eastern side of Sideling Hill Creek is known as the Woodmont Section and is managed by the DNR.

### **1.2.3 Installation History**

The MDARNG began using the Lil Aaron Straus Wilderness Area in 1974 for survival and small unit tactical training by the 29th Infantry Division. The MDARNG leased the property from the Baltimore Area Council of the Boy Scouts of America, Inc., who at the time owned the property. The Boy Scouts sold the property to the DNR in 1990. On March 11, 1991 the MDARNG signed a 25-year lease with the DNR for use of the facility for light military and non-military training purposes. The agreement of lease was approved by the Maryland Board of Public Works on May 15, 1991. In September of 1999 the name of the facility was changed to the Brigadier General Thomas B. Baker Training Facility.

### **1.2.4 Neighbors**

The boundaries of TBBTF are shown in Figure 1-2. TBBTF is bordered to the north and east by the Sideling Hill Wildlife Management Area, which is managed by DNR; to the south by abandoned tracks of the Western Maryland Railroad and the C&O Canal National

Historical Park, managed by the U.S. National Park Service; and to the west by private lands used for agricultural and timber production (MDNHP, 1995).

The drainage area of Sideling Hill Creek has fewer areas in agricultural use than most other non-urban areas of the state due to roughness of the terrain. Forests in the area have been cut several times in the past for timber production. In 1909, most of TBBTF was either completely cleared of native vegetation or sparsely forested with mixed hardwoods and Virginia pine (*Pinus virginiana*) (MDNHP, 1995). Orchards occupied areas in the north and east of TBBTF and on some of the upper terraces between the Potomac River and Ziegler Road. The orchards were active in the early and mid twentieth century (see Section 3.17)(MDNHP, 1995).

### **1.3 RESPONSIBLE AND INTERESTED PARTIES**

The successful management of the natural resources at TBBTF and the implementation of this INRMP requires a cooperative effort among the parties directly responsible. The level of success can be enhanced by the development of partnerships among other parties with a vested interest in the responsible management of the natural resources at TBBTF. Brief descriptions of the parties directly responsible for the implementation of this INRMP, as well as other interested parties, are provided below.

#### **1.3.1 Maryland Army National Guard**

The MDARNG provides administrative and operational support to the TBBTF Site Manager, ensuring that the INRMP is implemented.

The Adjutant General (TAG) is directly responsible for the operation and maintenance of TBBTF, which includes implementation of the INRMP. TAG ensures that all installation land users are aware of, and comply with procedures, requirements, or applicable laws and regulations to accomplish the goals and objectives of the INRMP.

The MDARNG Environmental Programs Manager is responsible for managing flora, fauna, air quality, and water quality on the training sites and for advising MDARNG on the best ways to comply with Federal and state environmental laws and regulations.

The Site Manager has the primary responsibility for scheduling military training and use of TBBTF and for the development of Standing Operating Procedures.

The MDARNG Environmental Office provides a full range of environmental, financial, and engineering disciplines for all facilities under the jurisdiction of the Maryland Military Department, including TBBTF.



### **1.3.2 TBBTF Site Manager**

The Site Manager is responsible for the overall maintenance and operation of TBBTF and for ensuring that the INRMP is implemented. The site manager is the representative of TAG and has all the responsibilities assigned by TAG.

The Site Manager is familiar with all aspects of the training site, including training scheduling and conflicts, location of training facilities, impairments or problems with human-made structures or natural functions, and needs for improvement or maintenance of the training lands. The site manager ensures that maintenance projects are identified and executed; vegetative cover is maintained on erodible soils; wetlands and other sensitive habitats are protected from training activities; streambanks are monitored for erosion; cultural resources are protected, if they are discovered; cemeteries are protected from disturbance; and troops are made aware of sensitive environmental conditions and use constraints prior to training operations.

### **1.3.3 National Guard Bureau**

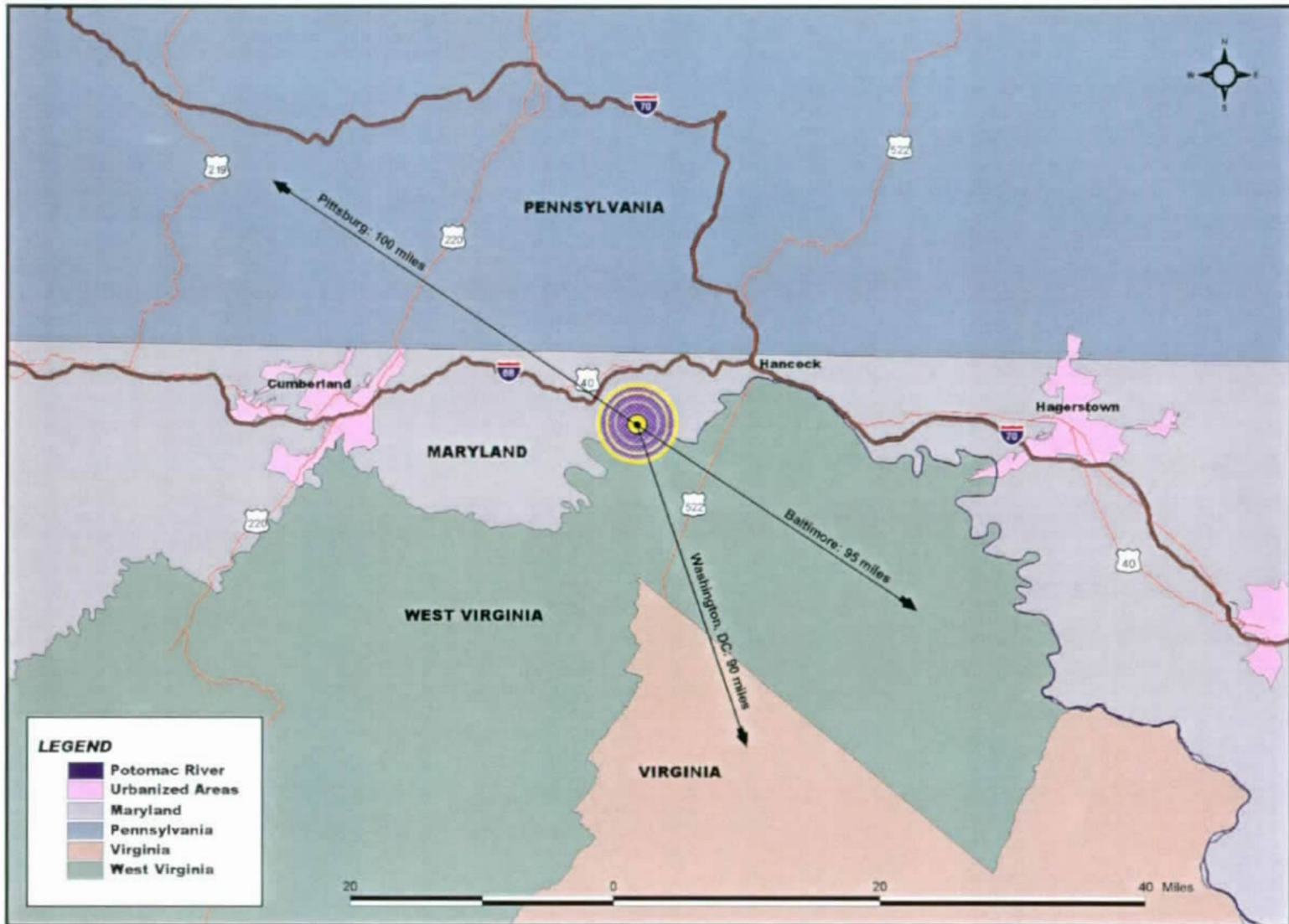
The NGB provides policy guidance and administrative and financial support to TBBTF. The NGB is responsible for reviewing, providing comments, and approving TBBTF's INRMP. The Natural Resources Manager at the Environmental Programs Division (NGB-ARE) is responsible for reviewing the INRMP and providing comments and recommendations to the MDARNG Environmental Office prior to submittal of the plan to the U.S. Fish and Wildlife Service (USFWS), DNR, the State Historic Preservation Office (SHPO), and other state agencies. The MDARNG Environmental Program Manager ensures operational readiness by sustaining an environmental ethic, and is responsible for tracking projects, providing technical assistance, quality assurance, and the execution of funds.

The National Guard Bureau Training Division (NGB-ART) is responsible for coordination of Integrated Training Area Management (ITAM) activities with other training support requirements and validates ITAM projects at TBBTF.

The National Guard Bureau Installations Division (NGB-ARI) coordinates proposed construction projects with the NGB-ARE and NGB-ART and provides design and construction support.

### **1.3.4 Federal Agencies**

Other Federal agencies, in addition to the Department of Defense (DoD), have an interest or role in the management of the natural resources at TBBTF. The involvement of these agencies is based on signatory responsibilities, cooperative agreements, regulatory authority, and technical assistance as required by Federal laws and regulations. The agencies and their roles and responsibilities are described below.

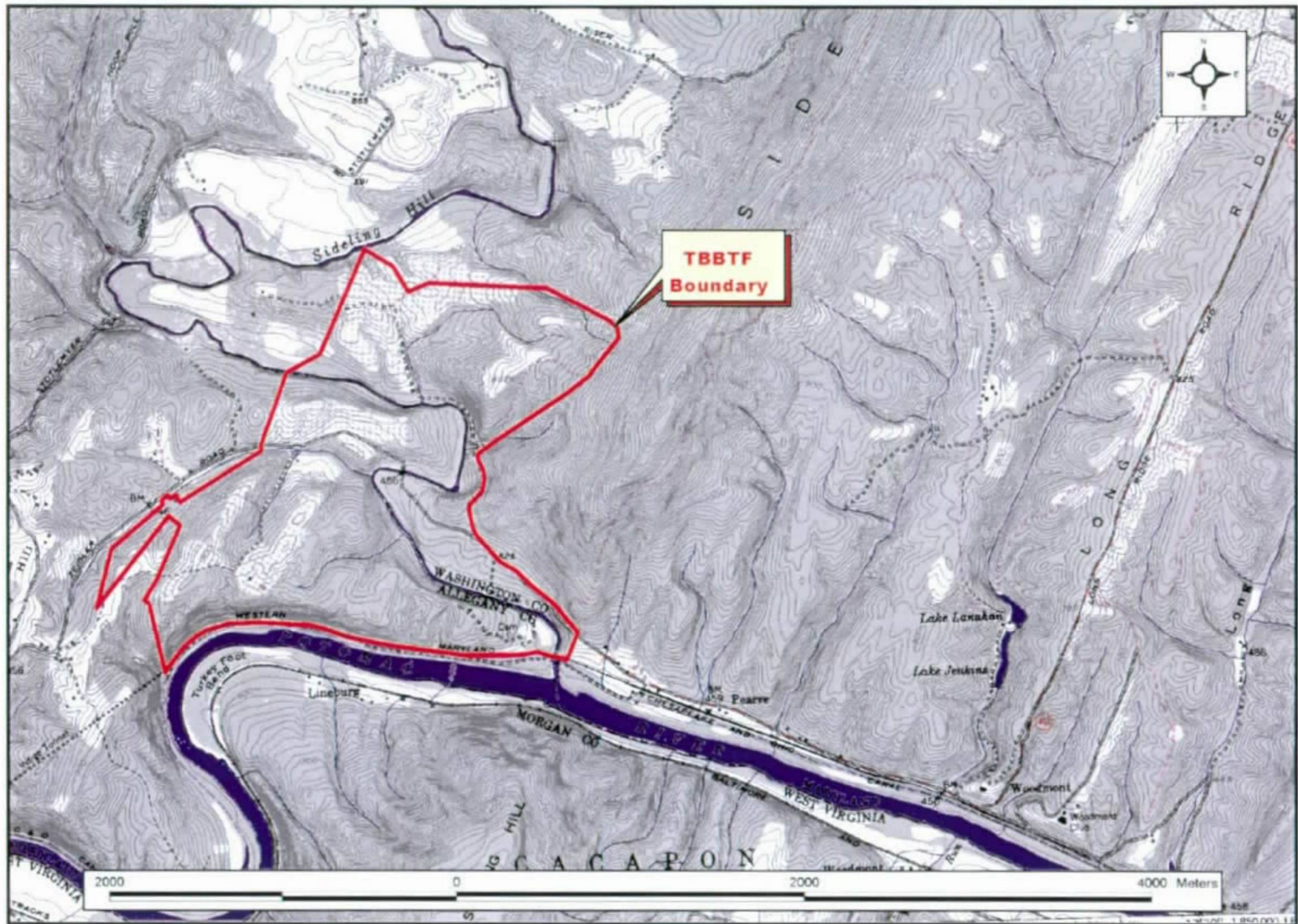


Regional Location

Figure 1-1

Brigadier General Thomas B. Baker Training Facility, Maryland

Source ESRI and US Geological Survey



**Location and Boundaries**

**Figure 1-2**

Brigadier General Thomas B Baker Training Facility, Maryland

Source USGS 7 5 Mr/e Senet Topographic  
Map Bollegrucv MD-PA.-WVA 1974



**U.S. Department of the Interior, Fish and Wildlife Service.** USFWS provides input concerning the MDARNG's proposal for conservation, protection, and management of the fish and wildlife resources presented in the INRMP for TBBTF. USFWS is the primary Federal agency for issues regarding fish and wildlife management, as well as the regulatory authority for the Endangered Species Act of 1973 and the Migratory Bird Treaty Act (16 U.S.C. 703-711).

### 1.3.5 State Agencies

**The Maryland Department of Natural Resources.** DNR leases TBBTF to the MDARNG. They will provide input concerning the conservation, protection, and management of the fish and wildlife resources on TBBTF. The DNR has also provided technical support for the assessment and management of natural resources on TBBTF.

The DNR is currently conducting a restoration project involving the use of agency and The Nature Conservancy (TNC) staff and volunteers to attempt to restore natural conditions on the Boy Scout Barren (see Section 3.14.2). The three-to-four year effort, initiated in the spring of 2000, targets the removal of barren brome (*Bromus sterilis*), an exotic invasive grass, from the barren.

The DNR Forest, Wildlife, and Heritage Service, Wildlife and Heritage Division is responsible for the management of the Sideling Hill Wildlife Management Area which encompasses TBBTF. The Division actively manages the section of TBBTF to the east of Sideling Hill Creek.

### 1.3.6 Contractors

Contractors provide TBBTF with technical support for natural resources and environmental management projects. Technical support includes preparation of the INRMP, National Environmental Policy Act (NEPA) analysis and documentation, and cultural and biological resource surveys.

### 1.3.7 Other Interested Parties

**The Nature Conservancy.** TNC provides technical support for the assessment and management of rare, threatened, and endangered species and sensitive habitats on TBBTF. They currently provide support in the assessment, control, and eradication of invasive exotic plant species on the facility and also conduct monitoring studies of the federally endangered plant harperella (*Ptilimnium viviparum*) in Sideling Hill Creek on TBBTF.

**The Maryland Native Plant Society.** The Maryland Native Plant Society will provide voluntary technical and labor support for the control and eradication of invasive exotic plant species on TBBTF.

## **1.4 NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE AND INTEGRATION**

### **1.4.1 National Environmental Policy Act of 1969**

NEP A is a Federal statute requiring the identification and analysis of the potential environmental effects of certain proposed Federal actions before those actions are initiated. Under NEP A, Federal agencies take into consideration the environmental consequences of proposed major actions. The passage of NEPA legislated a structural approach to environmental impact analysis in the planning of Federal agency programs and projects. NEPA requires that for every proposal for Federal actions, Federal agencies use a systematic, interdisciplinary approach that evaluates the potential environmental consequences associated with the proposed action and considers alternative courses of action. Except in some state emergency situations, the Army National Guard (ARNG) acts as a Federal agency, and therefore must comply with the requirements of NEPA, its implementing regulations, and other related Federal statutes (USAGE, 1997).

The Council of Environmental Quality (CEQ) was established under NEPA to implement and oversee Federal policy in the decision making process. The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

An environmental assessment (EA) is the type of NEPA analysis most commonly conducted by the ARNG for actions that require written consideration of the environmental effects of a proposed action beyond the preparation of the record of decision. The CEQ regulations (40 CFR Part 1508.9) describe an EA as a concise public document that provides sufficient analysis of an action to determine whether the action has no significant environmental effects or whether a more detailed analysis is required. Its purpose is to assist the decision-maker in understanding the environmental effects of a proposed action and alternatives, and in determining whether any effects are significant and thus require the preparation of an Environmental Impact Statement (EIS). The EA is prepared to:

- provide evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact (FNSI);
- aid in ARNG's compliance with NEPA when an EIS is unnecessary;
- or facilitate the preparation of an EIS when necessary.

In addition, according to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures by law or agency practice so that all such procedures run concurrently rather than consecutively" (40 CFR 1500.2(c)).

### **1.4.2 Army Regulations 200-2, 200-3, and 200-4**

AR 200-2, *Environmental Effects of Army Actions*, provides ARNG guidance and procedures for complying with NEPA and sets forth policy for integrating environmental

considerations into ARNG planning and decision making. AR 200-2 directs installations to integrate environmental analyses and documentation as much as practicable with other environmental reviews, laws, and Executive Orders. The regulation specifically identifies the INRMP as a type of document that should be reviewed for environmental considerations prior to implementation. Therefore, the requirements of AR 200-2 must be addressed in the context of environmentally assessing the potential effects of a proposed action to implement an INRMP once it has been developed.

INRMPs are developed in accordance with AR 200-3, *Natural Resources Land, Forest, and Wildlife Management*, which provides ARNG guidance and procedures for protection of natural resources, including conservation, management, and restoration. The regulation sets forth policy, procedures, and responsibilities for the conservation, management, and restoration of land and natural resources in a manner consistent with the military mission and national policies. AR 200-3 states that all natural resources management plans require some level of environmental review and the appropriate level of documentation will be determined based upon requirements set forth in NEPA and AR 200-2 on an installation by installation basis. AR 200-3 further states that it is ARNG policy to integrate environmental reviews concurrently with other ARNG planning and decision-making actions to avoid delays in mission accomplishments. The INRMP Policy Memorandum (HQDA, 1997) states that with regard to NEPA requirements, implementation of the INRMP shall serve as the proposed action and NEPA documentation should be scoped to address appropriate alternatives and issues.

AR 200-4, *Cultural Resources Management*, prescribes ARNG policies, procedures, and responsibilities for meeting cultural resources compliance and management requirements. The scope of AR 200-4 includes the National Historic Preservation Act; American Indian Religious Freedom Act and Executive Order 13007; Native American Graves Protection and Repatriation Act; Archeological Resources Protection Act, 36 CFR 79; and other policies affecting cultural resources management. The policies are designed to ensure that ARNG installations make informed decisions regarding the cultural resources under their control in compliance with public laws, in support of the military mission, and consistent with sound principles of cultural resources management (HQDA, 1998). PAM 200-4 provides guidance for implementation of ARNG's policy as prescribed in AR 200-4.

Integrated Cultural Resources Management Plans are ARNG compliance and management plans that integrate the entirety of the installation cultural resources program with ongoing mission activities, allow for identification of potential conflicts between the installation's mission and cultural resources, and identify compliance actions necessary to maintain the availability of mission essential properties and acreages. A statewide Integrated Cultural Resources Management Plan, and associated NEPA documentation, applicable to TBBTF is currently being developed. Guidelines established in the plan for the preservation and management of cultural resources will be implemented at TBBTF once the plan is completed.



**1.4.3 INRMP and NEPA Integration**

ARNG and other DoD agencies have, historically, prepared NEPA analysis and documentation for proposed actions to implement plans, such as INRMPs, as separate documents after the plans have been developed. This approach complies generally with NEPA regulations and policies, but is cumbersome, often resulting in repetition and redundancy associated with developing completely separate documents.

CEQ regulations (40 CFR §1506.4) encourage the combination of NEPA documents with other agency documents to reduce duplication of paperwork so that agencies can focus on the real intent of the NEPA analysis, which is to make better decisions. This recommendation is not routinely followed for various reasons, but it is supported by ARNG leadership, CEQ, the USFWS, and the U.S. Environmental Protection Agency (USEPA).

Army guidelines recommend that the INRMP and its associated NEPA analysis and documentation be prepared concurrently. In an effort to alleviate the drawbacks of preparing sequential documents and to streamline the overall process, TBBTF has fully integrated the INRMP and its associated NEPA analysis and documentation into a single plan. This document has been prepared using the concurrent and fully integrated NEPA analysis approach. The approach embraces the intent and spirit of NEPA, as well as the requirements of AR 200-2 and AR 200-3. It also formalizes existing natural resource practices and can be used as an effective tool for future planning and decision making.

The INRMP sections of the document provide management measures that have been developed by considering various alternatives for meeting resource-specific goals and objectives at TBBTF. The INRMP also provides the rationale for why certain management measures have been selected for implementation and others have not, based on the analysis of resource specific screening criteria. The EA sections of the document carry forward the INRMP’s selected management measures as the proposed action. Since other management measures are considered and dismissed from further consideration in the INRMP, the EA addresses only the proposed action and a no action alternative.

Table 1-1 shows where corresponding EA sections occur within this document.

**Table 1-1  
NEPA Analysis and Corresponding INRMP Sections**

<b>Required NEPA Analysis</b>	<b>Corresponding INRMP Section</b>
The Executive Summary briefly describes the proposed action and environmental consequences of implementing the proposed action.	Follows the Table of Contents
The Purpose and Need for the Proposed Action summarizes the proposed actions’ purpose and need and describes the scope of the environmental impact analysis process.	Section 1.4.4

<b>Required NEPA Analysis</b>	<b>Corresponding INRMP Section</b>
Description of the Proposed Action and Alternatives describes the proposed action of implementing the INRMP (the selected management measures) and an alternative to implementing the proposed action (the no action alternative).	Section 1.4.5  Section 5.0 (Alternatives to management options)
Scope of Analysis describes the scope of the environmental impact analysis process.	Section 1.4.6
Affected Environment describes the existing environmental conditions.	Section 3.0
Environmental Consequences identifies potential environmental effects of implementing the proposed action and the no action alternative.	Section 7.0
The Conclusions section identifies potential impacts associated with the alternatives and concludes which alternatives should be implemented.	Section 8.0
The References provide bibliographical information for cited sources.	Follows Section 8
List of Preparers identifies persons who prepared the document.	Follows the References Section
Persons Consulted provides a listing of persons and agencies consulted during preparation of the EA/INRMP.	Follows the List of Preparers
The Distribution List provides a list of recipients of the EA.	Follows Persons Consulted
The Appendixes include agency consultation letters and supplemental information used to develop the NEPA analysis and the INRMP.	Follows the Distribution List

#### **1.4.4 Purpose and Need for the Proposed Action**

TBBTF is proposing to implement the INRMP. The purpose of the proposed action is to carry out the resource specific management measures provided in the INRMP that will enable TBBTF to effectively manage the use and condition of natural resources located on the installation and protect the natural setting primarily for military training purposes. Implementation of the proposed action will support MDARNG's continuing need to train soldiers in a realistic natural setting while meeting other mission and community support requirements and complying with environmental regulations and policies.

### **1.4.5 Description of the Proposed Action and Alternatives**

The proposed action is to implement the INRMP for TBBTF. The proposal would meet MDARNG's underlying need to train soldiers in a realistic setting that is in compliance with environmental regulations and policies. The proposal includes natural resource management measures that reflect the geographical areas associated with the contiguous properties of the installation. In addition, because the INRMP is a living document, it will be modified, or adaptively managed, over time. The proposed action focuses on a five-year period, which is consistent with the management measures described in the INRMP. Implementation of the INRMP means that the proposed action involves putting in place the management measures presented in Section 5.0.

Alternatives considered for the management of TBBTF's natural resources are described and evaluated in the sections of this document that address the ecosystem-based management of each specific resource (see Section 5). The development of selected management measures for the INRMP involved a screening analysis of resource-specific management alternatives. The screening analysis involved the use of accepted criteria, standards and guidelines, and professional judgment to identify management practices for achieving TBBTF's management objectives. Management alternatives that were considered, but then eliminated during the screening analysis were eliminated because they were considered infeasible based on the available onsite work force, were economically infeasible, were considered ecologically unsound, were inconsistent with land use restrictions established in the deed agreement with DNR, or were incompatible with the requirements of the military mission.

Management alternatives that were considered during the screening process, but were not carried forward, are discussed in Section 5 following the management measures for each of the resource areas. Management alternatives that were eliminated and the reasons for elimination are presented under "Other Management Measures Considered" following each of the resource areas in Section 5.

The outcome of the screening analysis led to the development of the proposed action. Consistent with the intent of NEP A, the process focused on considering a reasonable range of resource-specific management alternatives and, from those, developing a plan that could be implemented, as a whole, over the life of the plan. Management measures determined to be infeasible were not analyzed in detail. Application of the screening process in developing the proposed action eliminated the need to define and evaluate hypothetical alternatives to plan implementation. As a result, the EA which has been made an integral part of this INRMP, formally addresses only two alternatives, the proposed action and the no action alternative (see Section 7).

Inclusion of a no action alternative is prescribed by CEQ regulations. The no action alternative serves as a baseline against which proposed Federal actions can be evaluated. Implementation of the no action alternative means that management measures prescribed in the INRMP would not be executed, existing management measures for natural resources would remain in effect, and existing conditions would continue as the status quo. This

document refers to the continuation of baseline conditions of the affected environment, without implementation of the proposed action, as the no action alternative.

#### **1.4.6 Scope of Analysis**

The potential environmental effects associated with the proposed action require assessment to comply with NEPA, CEQ regulations, and AR 200-2. The integrated EA identifies, documents, and evaluates the effects of implementing the INRMP for TBBTF. The INRMP addresses the geographical area associated with the contiguous properties of TBBTF. As discussed, this EA examines the MDARNG preferred alternative (proposed action) and the no action alternative.

The purpose of this analysis is to provide an objective evaluation of the environmental consequences of implementing the INRMP for TBBTF that can guide the installation in: meeting training needs and military mission requirements; achieving natural resources management goals; and meeting legal and policy requirements, including those associated with NEPA, that are consistent with current national natural resources management philosophies.

#### **1.4.7 Interagency Coordination and Review**

Interagency review has been invited throughout the process for developing the INRMP. With the INRMP draft, the EA can be used as a tool to inform decision-makers and the public of the likely environmental and socioeconomic consequences of implementing the proposed action and alternatives. In addition, TBBTF provides for public participation throughout the NEPA process to promote open communication and better decision making. The following section describes agency and public involvement for this project.

**Interagency Coordination.** On December 2, 1999, formal agency consultation letters were mailed to the regional office of the USFWS and the Regional Ecologist of the DNR Wildlife and Heritage Division. On December 13, 1999, a formal agency consultation letter was sent to the Maryland Historical Trust. The letters officially notified the agencies of TBBTF's intent to prepare an INRMP and the associated NEPA documentation. Copies of the agency correspondence letters and agency responses are presented in Appendix A. On January 3, 2001 the Bureau of Indian Affairs, Division of Tribal Government Services was contacted to determine contacts for consultation regarding DoD American Indian and Alaskan Native Policy (October 20, 1998) for interacting and working with federally recognized American Indian and Alaska Native governments. The Bureau of Indian Affairs, Division of Tribal Government Services stated that there are no federally recognized tribes in Maryland or in the surrounding state and commonwealths of West Virginia, Pennsylvania, or Virginia (West, 2001). A listing of persons consulted during the development of the INRMP/EA is provided following Section 8 in Persons Consulted. Appropriate notes and written records documenting the consultations have been maintained in the official Administrative Record and are incorporated into this document.

**Project Review and Comment.** The primary responsible agencies were provided an opportunity to review and comment on draft versions of the document. A list of agency reviewers is provided in the Distribution List following Section 8.

**Public Participation.** The public and concerned organizations including minority and low income, disadvantaged, and Native American groups will be notified of the findings and conclusions of the EA by an announcement of the availability of a Finding of No Significant Impact (FNSI) in the local newspaper. Notice of availability of the draft INRMP/EA for a public review period of 30 days was published in the Hancock News (Hancock, MD), Frederick Post (Frederick, MD), Herald-Mail (Hagerstown, MD) and the Cumberland Times (Cumberland, MD). Copies of the newspaper adds announcing the notice of availability are presented in Appendix E. Agency responses to review of the Draft INRMP/EA are presented in Appendix F. The draft INRMP/EA was made available for public review at the following libraries:

Hancock Library  
290 Park. Road  
Hancock, Maryland 21750

The Washington County Free Library  
100 South Potomac Street  
Hagerstown, Maryland 21740

and

Allegany County Library  
31 Washington Street  
Cumberland, Maryland 21502

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## **2.0 - MILITARY MISSION**

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## **2.0 MILITARY MISSION**

### **2.1 MISSION**

The Thomas B. Baker Training Facility (TBBTF) specializes in supporting training for light infantry combined arms operations. The area is adequate to support and train a battalion-sized element. The primary types of training on the facility are in land navigation and mountaineering. The land navigation training capabilities are considered to be state of the art. Additional types of training that can be supported by the facility include Combat Intelligence; Operations Security; Fundamentals of Patrolling; troop movement and small unit tactics; combat skills; individual training; performance in stressful situations; Survival, Evasion, Resistance, and Escape (SERE); medical care; water survival; and intelligence gathering. The facility is structured to operate, manage, and administer services of the facilities and assign use of resources to ensure training and logistical support to the Maryland Army National Guard (MDARNG) as well as units from other states. In addition, state and local agencies and civic groups are also supported.

The ARNG 29<sup>th</sup> Light Infantry Division is the primary user of the facility. The mission organization and training requirements of the 29<sup>th</sup> Light Infantry Division may change with national security requirements. The current military mission of the 29<sup>th</sup> Infantry Division is:

**Federal.** When needed, to mobilize, deploy by air and surface to an intermediate staging base, assemble, move to a U.S. Corps area of operations and conduct light combined arms operations.

**State.** When directed by State authority, provide units organized, equipped, and trained to function efficiently in the protection of life and property, and the preservation of peace, order, and public safety in military support to civil authority for disaster response, humanitarian relief, civil disturbance, counter-drug operations, and combating terrorism.

### **2.2 THE RELATIONSHIP BETWEEN THE MILITARY MISSION AND NATURAL RESOURCES**

The MDARNG recognizes that healthy and viable natural resources are necessary to support the military mission. Natural vegetative and landscape conditions are necessary to provide the realism needed to effectively train soldiers and support the military mission. Damage to, or removal of, vegetation can result in impacts to soil resources and the modification of natural landscape conditions as a result of erosion and sedimentation. Once the vegetation has been removed its reestablishment is difficult due to steep slopes and limited nutrient availability. The removal of vegetation and the development of erosion areas also enable the potential spread of invasive species on TBBTF. The spread of invasive species along with the erosion and deposition of soils can adversely effect

native vegetation, sensitive habitats and species, water quality, and ultimately the ability to effectively train in natural conditions.

The trainers and soldiers who use TBBTF should be aware of the environmental effects of training and recognize that their actions in the field directly affect the long-term sustainability of the training lands and their ability to continue training. Increasing the environmental awareness of the trainers and soldiers and enabling them to understand the long-term consequences of their actions can help to prevent environmental degradation during training activities. Implementing appropriate management practices, as well as considering alternatives to these measures as they are developed, limits the potential for serious alterations to the natural resources that are critical for providing a realistic training environment.

Elements of the Integrated Training Area Management program (see Section 4.3) implemented at TBBTF are used in the management and decision-making process to integrate training and other mission activities with sound natural resources management in order to ensure that the facility will continue to support training activities in realistic natural conditions. Observations of training impacts and impacts from natural events are used to determine the ability of training lands to support training activities. Based on existing land conditions, training activities may be modified or redirected to prevent additional impacts and to allow the area to be maintained or rehabilitated.

The primary mission of TBBTF is to support and train the MDARNG, and other military units in land navigation and mountaineering, therefore environmental initiatives and plans should be managed so as not to inhibit meeting these military requirements. However, it is important to recognize and consider limitations due to the presence of naturally occurring resources that should be avoided (e.g., endangered species, sensitive habitats, or wetlands).

Existing natural resources on TBBTF influence the manner in which the mission is executed. Although natural resources provide a realistic training environment for meeting mission requirements, their existence also has the potential to limit certain military plans and activities. For example, the presence of sensitive habitats and endangered species prevent military activities such as construction and digging from occurring due to the potential adverse impacts on those sensitive resources. In addition, any permanent degradation of natural resources as a result of ongoing military use would, in turn, ultimately lead to further mission impairment should realistic training conditions no longer be available. Therefore, not only is the proper management of natural resources and their use by the military a sound environmental practice, but it also directly supports TBBTF's mission to provide realistic training.

At TBBTF, ongoing mission related activities are restricted to those that cause the least amount of damage to the existing natural resources. Vehicular traffic is restricted to existing roads. Access to several roads during training activities is restricted to emergency vehicle use, limiting the potential for impacts to sensitive habitats and reducing the potential for damage to vegetation and the development of erosion hazards. The majority of natural resources impacts related to training are associated with foot

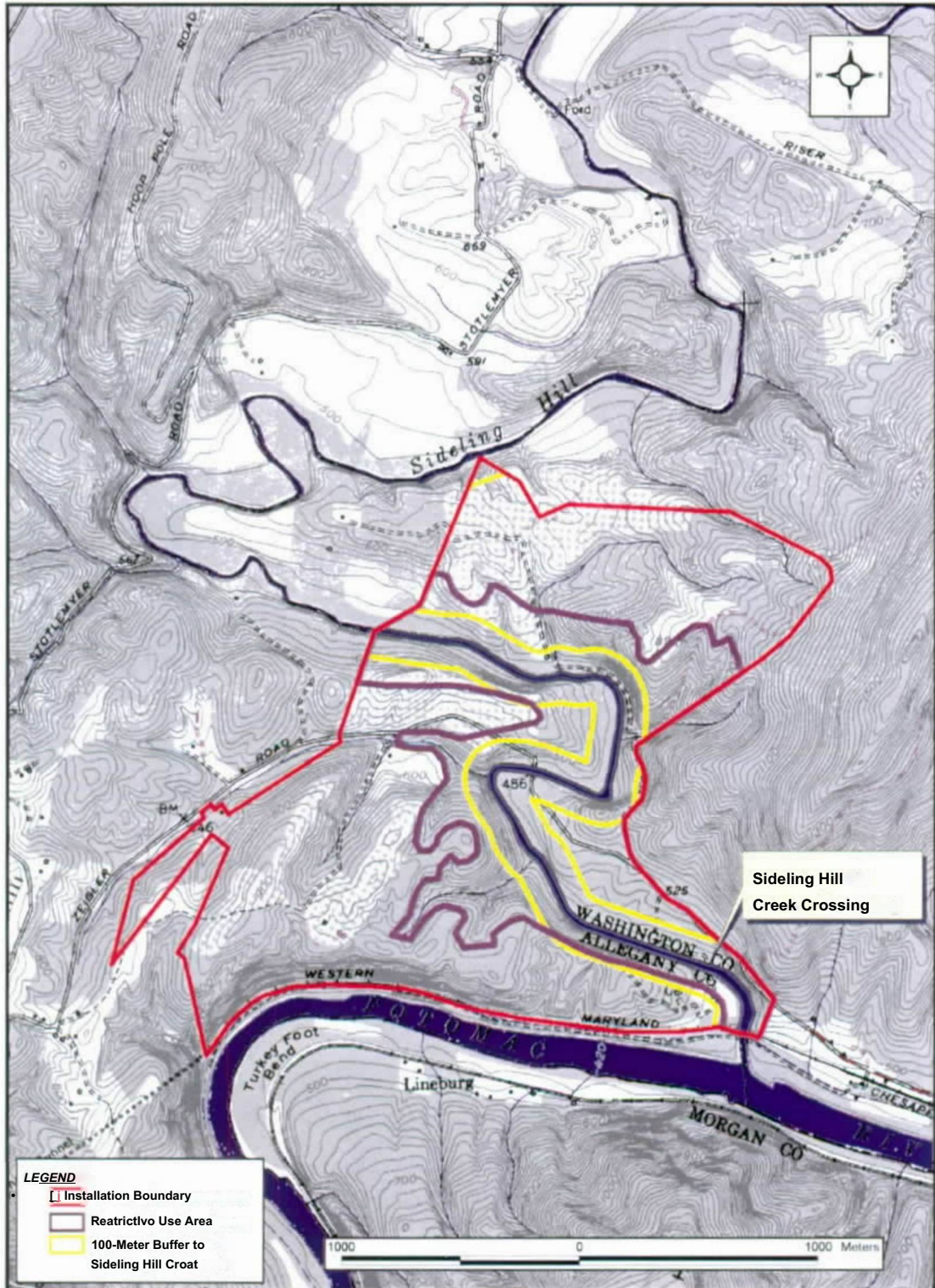
traffic. Foot traffic is limited in the Restricted Use Area (RUA) (see Figure 2-1) as established in the lease agreement between the MDARNG and DNR. Additional restrictions in the RUA include:

- no use of fire arms except as allowed for public hunting on the eastern side of Sideling Hill Creek;
- no rappelling, except at the approved site at the east end of the Straus Barren;
- no use of motorized vehicles, except for emergency vehicles;
- no construction of any kind;
- no training on, or use of, any areas containing shale barrens or endangered or threatened species of plants or animals; and
- no camping.

Additional access restrictions are placed within a 100-meter buffer on both banks of Sideling Hill Creek (see Figure 2-1). Cutting or clearing of vegetation is restricted throughout TBBTF and prohibited in the RUA and 100-meter buffer. In addition, ground excavation associated with training activities, use of portable latrines, and burning of fires outside of designated fire pits is prohibited.

In order to enable MDARNG to meet mission requirements to provide realistic training conditions on TBBTF, surveys of plant species and mussels were conducted by the USGS in 1997 at two locations on Sideling Hill Creek to determine a suitable stream crossing location. The study was conducted to determine a crossing location that would result in the least potential for environmental impact associated with training. As a result, a stream crossing was established at a former four-wheel drive crossing (ford) located approximately 1,000 feet upstream of the Western Maryland Railroad Bridge over Sideling Hill Creek (see Figure 2-1). The crossing is restricted to foot traffic during training exercises. No vehicles or machinery are allowed to cross the ford for transportation, or for any reason, except for in emergencies. To ensure that environmental impacts associated with the ford are minimized, management measures specific to the crossing have been developed as part of the INRMP. Management measures proposed to minimize and prevent environmental degradation at the crossing as well as measures directed at enhancing conditions at the crossing are prescribed in Section 5. In addition, Table 5-1 presents a summary of the management measures prescribed for the stream crossing area.

Proper care and maintenance of the training areas on TBBTF ensures continued long-term sustainability of realistic conditions for the various units that use them. The resource-specific management measures proposed to protect and enhance the natural resources and minimize or prevent environmental degradation at TBBTF are presented in detail in Section 5.



**Restricted Use Area and 100-Meter Siding Hill Creek Buffer**

**Figure 2-1**

Brigadier General Thomas B. Bakir Training Facility, Maryland Source JS Geokip>cai Survey Beieep 19M

### **2.3 FUTURE MILITARY MISSION IMPACTS ON NATURAL RESOURCES**

At this time, there are no known changes to the MDARNG military mission at TBBTF or to the type of training that occurs at the facility. The level of training on TBBTF is expected to double over the next several years. New sources of impacts other than those associated with increased use are not anticipated.

The primary long-range planning goal at TBBTF is to continue to provide training facilities while supporting environmental strategies and goals consistent with MDARNG regulations and policies. With long-range planning goals in mind, TBBTF has developed several short-range goals for the installation to support the current mission and meet future needs. To that end, this INRMP includes management recommendations that meet three short-range planning goals:

- (1) to implement a comprehensive environmental strategy that represents compliance, restoration, prevention, and conservation;
- (2) to improve the existing management approach to protecting natural resources on the installation; and
- (3) to meet legal and policy requirements consistent with national natural resources management philosophies.

Details of proposed management measures are discussed in Section 5.

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## **3.0 - AFFECTED ENVIRONMENT**

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## **3.0 AFFECTED ENVIRONMENT**

### **3.1 ENVIRONMENTAL SETTING**

TBBTF is located in Allegany and Washington Counties in northwestern Maryland. The site is bordered to the south by the Potomac River and the Chesapeake & Ohio (C&O) Canal National Historical Park, to the east by Sideling Hill Creek and the Sideling Hill Wildlife Management Area, and to the north and west by privately owned property. Green Ridge State Forest is located adjacent to the private property bordering the western boundary of TBBTF. The forest includes 39,358 acres extending west to Town Creek, north to the Maryland/Pennsylvania border and south to the Potomac River.

Sideling Hill Creek flows a distance of approximately two miles across the training facility. The creek flows onto TBBTF along its northwestern boundary, flows east across the north central section of the training facility, and then meanders south near the eastern boundary. Sideling Hill Creek flows into the Potomac River at the southeastern corner of the facility.

TBBTF is located in the Ridge and Valley Physiographic Province which is characterized by narrow mountain ridges and narrow steep valleys that trend in a northeast to southwest direction. The valley floors are relatively narrow and are characterized by flood plains and stream terraces. Slopes on TBBTF range from moderate to very steep with near vertical changes in elevation, in excess of 200 feet, occurring in places along Sideling Hill Creek and the Potomac River.

The climate is favorable for general farming and such specialties as truck crops and orchards. Forestry remains important in the area although most wooded areas have been harvested several times. Coal mining was once a major industry in the area but is now limited to a few small operations.

### **3.2 CLIMATE**

TBBTF is located in the middle latitudes, where the general atmospheric flow is from west to east across the North American continent. TBBTF has a continental type of climate with well defined seasons. Winters in the area are generally long and cold, but summers are moderate. The local climate is quite variable, especially in areas that are between the floors of valleys and the summits of ridges (USDA, 1977).

Topographic conditions in the area surrounding TBBTF make prediction of local weather difficult. The average annual temperature in the area ranges from 51° Fahrenheit (F) at Frostburg to 54° F at Westernport. Occurrences of temperatures of 90° F and higher range from 11 days a year at Frostburg to 26 days at Cumberland. Maryland's highest temperature, 109° F, has been reached several times at weather stations located in Allegany and Washington Counties. The average number of days per year with



temperatures at or below 32° F range from 115 days at Cumberland to 132 days at Frostburg (USDA, 1977). Table 3-1 provides additional climatic data for the area.

TBBTF is located in the rain shadow to the east of the Allegheny Plateau. Allegheny and Washington Counties have the least amount of rainfall of any of the counties in Maryland. Average rainfall in the rest of the state generally ranges between 40 and 49 inches. Within the area affected by the rain shadow, annual precipitation generally ranges from 35 to 41 inches. Snowfall in the area ranges from 30 to near 50 inches per year (USDA, 1977).

The predominate wind direction is from the northwest in the winter to the southwest in summer. The character and orientation of the valleys in the area can impose significant changes in both wind direction and speed. Thunderstorms occur on an average of about 35 days per year with the most storms occurring from May through August. The probability of tornadoes occurring in the area is low (USDA, 1977).

**Table 3-1**  
**Climatic Data for the Region Surrounding TBBTF\***

<b>Temperature (°F)</b>	
January Average	32.9
July Average	75.9
Maximum	109
Minimum	-12
<b>Killing Frosts</b>	
Last in Spring	April 27
First in Fall	October 14
Length of the growing season	170 days
<b>Average precipitation (inches)</b>	
January	2.76
February	2.28
March	3.02
April	3.14
May	3.29
June	4.01
July	3.17
August	3.72
September	2.72
October	2.47
November	1.95
December	2.69
Annual	35.22

\*All data recorded at Cumberland, MD  
Source: Mash, 1996

### **3.3 AIR QUALITY**

Air quality is regulated at the national level through regulations promulgated under the Clean Air Act (CAA) of 1970 (42 U.S.C. §§7401-7671g) and its subsequent amendments. The purpose of the Act is to protect public health and welfare through the control of air pollution at its source. The CAA directed USEPA to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that endanger public health. USEPA subsequently adopted air quality standards for six criteria pollutants including sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>), ground-level ozone (O<sub>3</sub>), and lead particles (Pb). The CAA requires state or local governments to monitor ambient levels of these pollutants and to develop air quality management plans, or State Implementation Plans (SIPs), for the prevention, control and abatement of air pollution and to ensure compliance with the standards.

To evaluate compliance with the NAAQS, USEPA has divided the country into geographical regions known as air quality control regions (AQCRs). Each AQCR has multiple air monitoring stations to sample ambient air quality levels of the criteria pollutants. Since ozone is not emitted directly, emissions or pollutants that contribute to its formation are tracked. The precursor emissions are volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>). NO<sub>x</sub> emissions are also used to track NO<sub>2</sub> concentrations. Attainment and nonattainment indicate the compliance status of AQCRs with respect to the NAAQS.

Air quality issues related to TBBTF are administered at the Federal level by USEPA, Region 3, and at the state level by the Maryland Department of the Environment, Air and Radiation Management Administration. TBBTF falls within the Cumberland/Keyser Interstate AQCR 113 which includes Allegany, Washington and Garrett counties. AQCR 113 is in attainment for all six criteria air pollutants (Gluth, 1999). The tons of criteria air pollutant emissions by year for Allegany County is presented in Table 3-2. Emissions for lead are not included in Table 3.2 because the data are not available at the county level. Data addressing tons of criteria air pollutants for Washington County were not available.

#### **3.3.1 Air Pollutant Emissions at TBBTF**

Sources of air pollution on TBBTF are limited primarily to vehicle use, campfires and pyrotechnics. Vehicle use is limited primarily to administrative activities and campfires are restricted to designated locations. The use of pyrotechnics is also limited on TBBTF. Combined sources of air pollutants on the training facility produce low levels of emissions.

### **3.4 NOISE**

The Noise Control Act of 1972 (42 U.S.C. §4901-4918) establishes a national policy to promote an environment free from noise that jeopardizes the health and welfare of Americans. The Act directs all Federal agencies to comply with applicable Federal, state,

**Table 3-2**

**Tons of Criteria Pollutant Emissions for Allegany County, Maryland**

<b>Year</b>	<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	<b>Nitrogen Oxides (NO<sub>x</sub>)</b>	<b>Volatile Organic Compounds (VOCs)</b>	<b>Carbon Monoxide (CO)</b>	<b>Particulate Matter (PM<sub>10</sub>)</b>
1986	19,383	8,612	6,752	42,367	8,590
1987	18,369	8,233	6,644	40,745	8,646
1988	18,701	8,458	6,763	41,699	8,656
1989	17,500	8,086	5,870	35,923	7,981
1990	37,798	12,609	6,038	37,146	4,559
1991	34,710	12,067	6,070	35,586	4,535
1992	18,717	9,080	5,479	30,251	4,101
1993	18,572	9,052	5,401	29,501	4,308
1994	13,628	8,263	5,486	29,895	3,878
1995	12,200	7,828	5,590	29,825	3,803
1996	34,242	11,353	5,473	30,846	4,172

Source: USEPA, 1999

interstate, and local noise control regulations. In 1974, USEPA provided information on negative effects of noise, identifying indoor and outdoor limits that protect public health and welfare (e.g., prevent hearing damage, sleep disturbance, and communication disruption). In addition, sound quality criteria promulgated by USEPA, the U.S. Department of Housing and Urban Development, and DoD have identified noise levels to protect public health and welfare with an adequate margin of safety. These levels are considered acceptable guidelines for assessing noise conditions in an environmental setting. Noise levels below 65 decibels (dB) are considered to be normally acceptable in suitable living environments.

The primary sources of noise at TBBTF are from the occasional use of blanks or pyrotechnics (artillery and grenade simulators) during training activities and helicopters. Use of blanks and pyrotechnics must be approved by the State Facilities Sites Manager in writing prior to the training event. Use of blanks or pyrotechnics after 1800 hours is not permitted. Noise discipline is in effect at TBBTF between 2200 and 0500 hours.

Helicopter activity on TBBTF is very limited. Helicopters that access TBBTF stage out of Hagerstown, Maryland; Aberdeen, Edgewood or Essex, Maryland; and Baltimore, Maryland or Pennsylvania. Most of the helicopters land in Green Ridge State Forest. Landings at TBBTF are very limited and are mostly related to administrative activities. Helicopters are only allowed to land at TBBTF at night if there is a medical emergency requiring their use. Helicopter landing sites for medical evacuations are located adjacent to the Baker Building, in the field adjacent to Straus Lodge, and at an alternate site

located to the east of Sideling Hill Creek adjacent to the Woodmont land navigation training area.

### **3.5 TOPOGRAPHY**

Differential erosion over the past 400 million years, caused by variations in rock lithologies, has resulted in the development of a high variability in local relief in the area encompassing TBBTF (see Figure 3-1). Slopes on the training facility range from moderate to very steep and near vertical changes in elevation, in excess of 200 feet, occur in places along Sideling Hill Creek and the Potomac River. Cliffs of approximately 120 feet in height occur along Sideling Hill Creek, and changes in elevation of over 500 feet in as little as two tenths of a mile occur in the area. Elevations on TBBTF commonly reach 800 feet above sea level with a maximum elevation of approximately 1,000 feet above sea level occurring on Sidling Hill in the northeastern corner of the facility. The lowest elevation on TBBTF occurs at the Potomac River and is approximately 420 feet above sea level. Elevations just to the east of TBBTF reach 1,600 feet above sea level at Sideling Hill. Elevations to the west of TBBTF reach approximately 1,700 feet above sea level at Town Hill. Sidling Hill and Town Hill, which both trend northeast to southwest, form the boundaries of the Sideling Hill Creek watershed.

### **3.6 GEOLOGY**

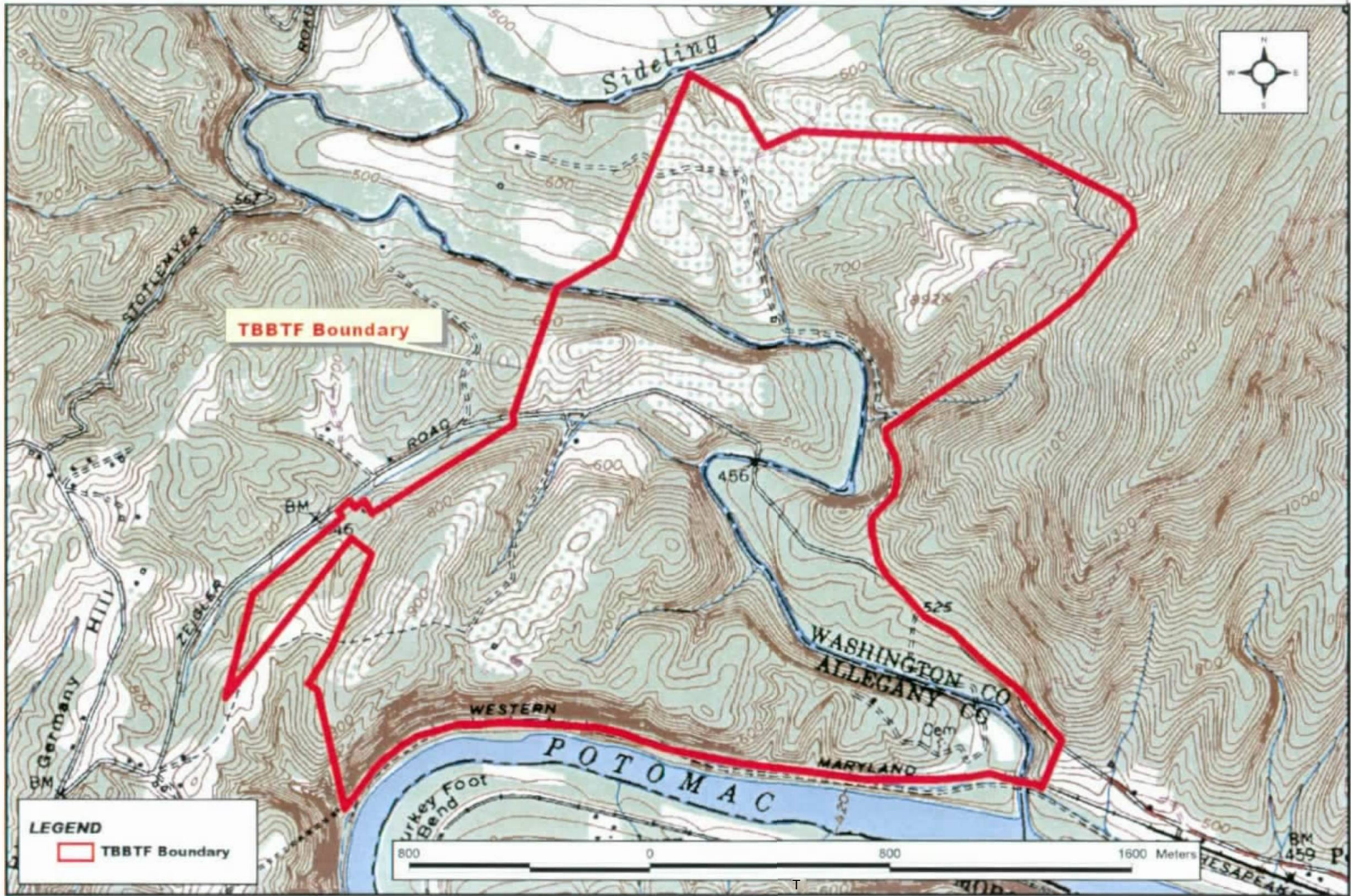
#### **3.6.1 General Geology**

TBBTF is located in the Ridge and Valley Physiographic Province. The Ridge and Valley is characterized by sedimentary rock formations that have been tightly folded into a series of somewhat asymmetrical anticlines and synclines. The tight folds create outcrops that occur in thin bands. Differences in the weathering resistance of the thinly banded formations result in the development of a landscape characterized by a series of closely spaced northeast to southwest trending ridges and valleys. The ridges developed where weather resistant formations occur at the surface and the valleys occur where less resistant formations are located.

Sedimentary rocks occurring in the vicinity of TBBTF consist of sandstones, shales, and limestones deposited primarily during the Devonian Period (350 to 400 million years ago). A few of the formations occurring in the area were deposited during the Mississippian Period (300 to 350 million years ago).

The western section of TBBTF is underlain by the Chemung Formation. The formation consists of interbedded gray, olive green, yellow, and brown arenaceous shale and sandstone with layers of massive conglomerate. The eastern section of the training facility is underlain by the Hampshire Formation, consisting of brownish to reddish sandstone, arkosic sandstone, and red shale with sporadic layers of green shale. The contact between the Chemung Formation and the Hampshire Formation runs approximately northeast to southwest in the vicinity of the site manager's house. A





**Topography**

Brigadier General Thomas B Baker Training Facility, Maryland

**Figure 3-1**

Source US Geotogcal Survey B\*\*yove 1974

small section of TBBTF, near the mouth of Sideling Hill Creek, is underlain by the Rockwell Formation of the Mississippian Period. The formation consists of coarse-grained sandstones, fine-grained conglomerate, and shale. Thin shaley coal beds also occur at places in the Rockwell Formation (MDNHP, 1995).

The Purslane Formation, which consists predominantly of sandstones along with siltstone, shale, and shaley coal, overlies the Rockwell Formation in the vicinity of TBBTF. Weather resistant sandstone in the Purslane Formation is responsible for the development of both Sideling Hill and Town Hill (Schmidt, Jr., 1993).

Unconsolidated surficial deposits laid down during the Quaternary Period (present to approximately 10,000 years ago) also occur on TBBTF. Ancient terrace gravels consisting of well-rounded cobbles and pebbles in a matrix of orange-red sand and clay overlie the Chemung and Hampshire Formations, at the north end of Allegheny County Line Road. Floodplains along Sideling Hill Creek consist of alluvium made up of interbedded brown, red, tan, and gray, poorly sorted fine to medium grained sand and silt with some gravel. The floodplain deposits also rarely contain layers of peaty clay (MDNHP, 1995).

### **3.6.2 Seismicity and Seismic Hazard**

The mid-Atlantic and central Appalachian region, including Maryland, is characterized by a moderate amount of low level earthquake activity. There are numerous faults in Maryland, but none are known to be active. Recent evidence suggests earthquakes in the Ridge and Valley Province occur at shallow depths in Precambrian (>545 million years ago) crystalline and Paleozoic (approximately 280-545 million years ago) sedimentary rocks. The geologic structures suspected of being responsible for earthquake activity in the province are preexisting zones of very low angle reverse, or thrust, faults (Reger, 1999).

In historical times, Maryland's seismicity has been among the lowest of the states in the Mid Atlantic region. Between 1758 and 1991, only 25 very minor earthquakes were recorded in Maryland. Two of the recorded earthquakes occurred in the Ridge and Valley Province. Maryland's strongest recorded earthquake occurred in Hancock in 1978 and had a magnitude of 3.1 on the Richter Scale. Earthquakes with magnitudes of 3.1 are considered to be minor and very seldom result in significant damage or injury (Reger, 1999).

Until 1990, Maryland averaged one small earthquake every ten years. Between 1990 and 1997, 31 very minor to minor earthquakes occurred in central Maryland in Howard, Carroll, and Baltimore counties. No earthquakes have been recorded in the vicinity of TBBTF since the occurrence near Hancock in 1978.

Based on the latest Federal listing of the state's seismic hazard ratings published in 1998, Maryland is rated as a medium hazard. The new ranking, which lists states as having a low, medium, high or very high hazard, elevated Maryland from a low to medium hazard. The seismic hazard relates to primary effects of earthquakes such as ground shaking,

surface rupture, local uplift and subsidence, and liquefaction. Seismic hazard is usually depicted in terms of maximum horizontal velocity or peak acceleration of seismic waves, both of which are indicators of probable ground motion or shaking associated with an earthquake (Reger, 1999).

Maryland building codes subscribe to the BOCA (Building Officials and Code Administrators, Inc.) National Building Code, but do not currently apply the seismic provisions in the code (Reger, 1999).

### **3.6.3 Petroleum and Minerals**

There are no petroleum or mineral resources extracted or produced on TBBTF.

## **3.7 SOILS**

Most of the soils in the vicinity of TBBTF are derived from shale. These soils are generally less than 20 inches thick and overlie shale bedrock. The shale derived soils are typically somewhat excessively drained and have the lowest water holding capacity in the area. Their available moisture is rapidly exhausted during dry periods. The soils are moderately productive, and in upland areas, are almost entirely forested. Agriculture is practiced on the bottomlands where the soils are deeper and more fertile. Soils in the area are generally considered to be loamy (loams have a good balance of sand, silt, and clay), but, because they are derived from shale, have a higher proportion of silt and are classified as shaley silt loams. Soils derived from weathering sandstone have a higher proportion of sand and those derived from limestone have a higher proportion of clay. The primary limiting factors of soils in the area for plant growth are the shallow to rock conditions and deficient moisture holding capacity (Mash, 1996).

A site-specific survey of soils on TBBTF has not been conducted. Based on the Soil Surveys of Allegany and Washington Counties, compiled by the USDA, there are 45 soil mapping units occurring on TBBTF (see Figures 3-2a and 3-2b). Some variations in series names, mapping units, and boundaries occur between the soil survey for Allegany County and the survey for Washington County. The discrepancies are most apparent along the boundaries between the two counties. Variations in mapping units between counties result from historic differences in the classification, naming, and mapping of soil series between political boundaries. The soil descriptions do provide a useful characterization of the soils expected to occur in the two counties despite minor differences in map unit naming and boundary variations. The Soil Survey for Washington County is currently being revised and should address some of the discrepancies. NRCS has been contracted to conduct a soil survey of TBBTF, but had yet to conduct the field work at the time this INRMP was developed.

Table 3-3 lists the soil mapping units occurring on TBBTF and provides general characteristics of the soil series or soil complexes. Drainage characteristics, textural characteristics, landscape position, and some potential limitations associated with the mapping units are provided.

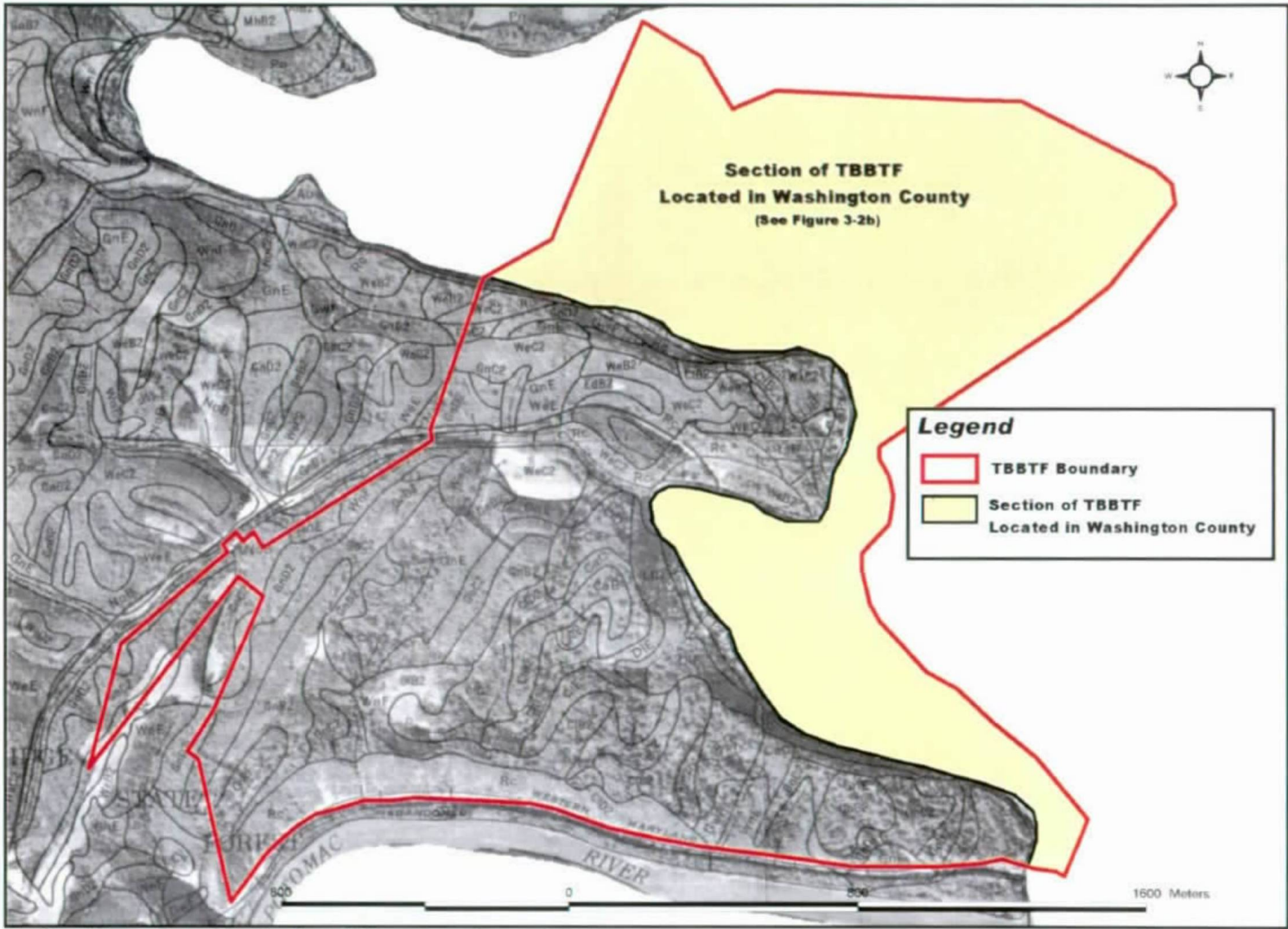
Mapping units designated as hydric or that have inclusions that are hydric are also indicated in Table 3-3. Hydric soils are soils that are saturated, flooded, or ponded for long enough during the growing season to develop anaerobic (oxygen-deficient) conditions in their upper part. Anaerobic soil conditions are conducive to the establishment of vegetation that is adapted for growth under oxygen-deficient conditions and is typically found in wetlands (hydrophytic vegetation). Areas on TBBTF where hydric soils have been mapped are typically associated with the general location of wetlands on the installation. The Nolo silt loam, 3-10 percent slopes, which occurs adjacent to Ziegler Road, along an unnamed tributary of Sideling Hill Creek, is designated as hydric. The Monongahela silt loam, 3-8 percent slopes and the Monongahela silt loam, 8-15 percent slopes, which occur in a small area in the northwestern section of TBBTF, both have the potential to have hydric inclusions.

The Pope silt loam, which occurs along Sideling Hill Creek on TBBTF, is designated as a prime farmland soil. Prime farmland soils are essential components of areas designated as prime farmland. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are those needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water.

Prime farmlands are protected under the Farmland Protection Policy Act (FPPA) of 1981. The intent of the Act is to minimize the extent to which Federal programs contribute to the unnecessary or irreversible conversion of farmlands to nonagricultural uses. The Act also ensures that Federal programs are administered in a manner that, to the extent practicable, will be compatible with private, state, and local government programs and policies to protect farmland. The Natural Resources Conservation Service (NRCS) is responsible for overseeing compliance with the FPPA and has developed the rules and regulations for implementation of the Act (see 7 CFR Part 658, July 5, 1984). The implementing procedures of the FPPA and NRCS require Federal agencies to evaluate the adverse effects (direct and indirect) of their activities on prime and unique farmland, as well as farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects, considerable variation in erosion potential among locations within units. Most problems associated with soil erosion on TBBTF would be expected to result from the removal of vegetation on moderate to severe slopes or on long gradual slopes.

The Pope silt loam occurs along Sideling Hill Creek within the RUA of TBBTF. Construction, or the cutting or clearing of vegetation is prohibited in the RUA. In addition, training, or the use of motorized vehicles in the area is restricted. Current land use restrictions prohibit activities that could adversely impact the condition or future use of the soils on TBBTF. Restrictions also preclude the future use of the Pope silt loam on TBBTF for agricultural purposes and therefore it would not be considered prime farmland where it occurs on the installation.



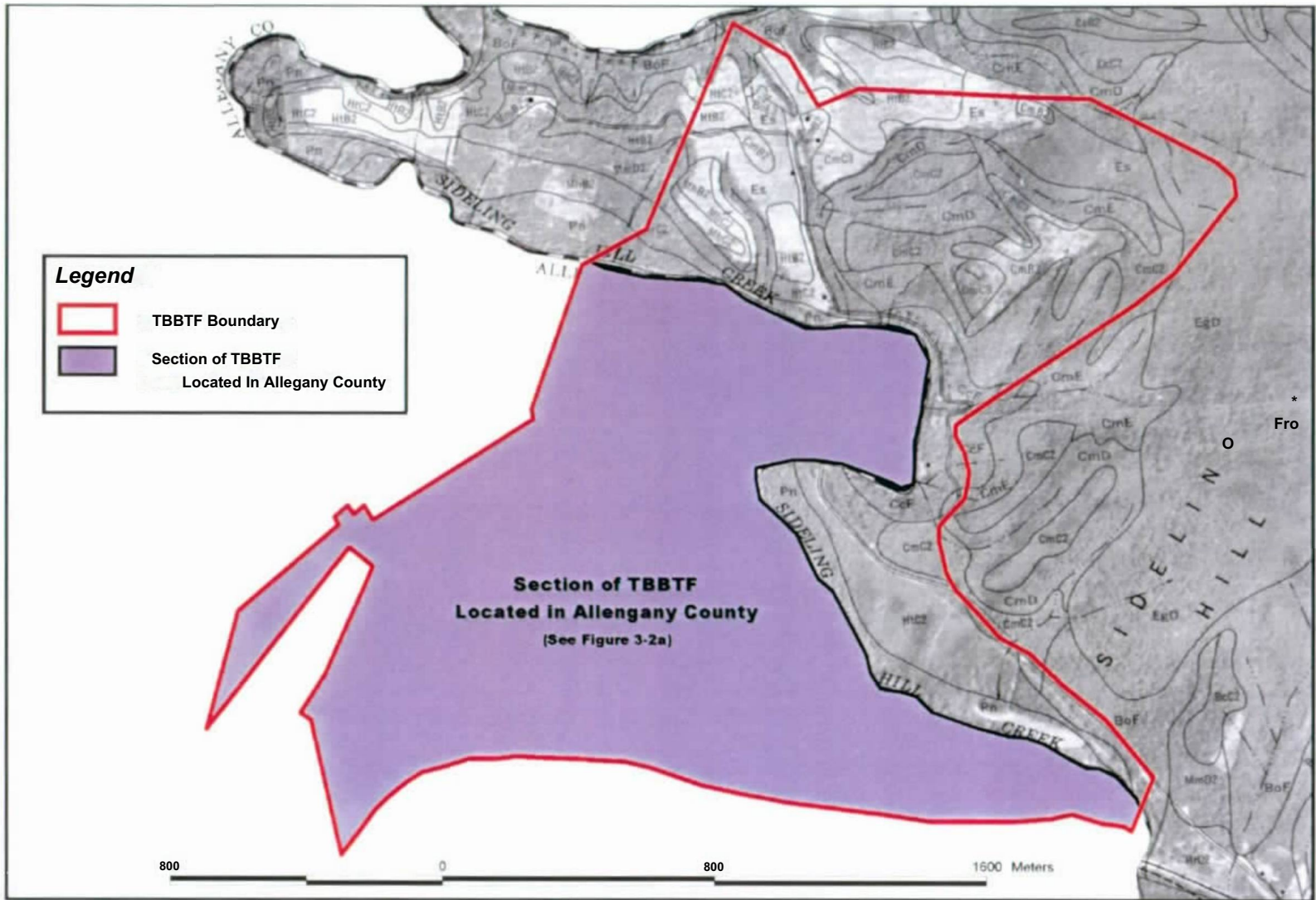


**Soils Mapping Units for Allegany County**

Brigadier General Thomas B. Baker Training Facility, Maryland

**Figure 3-2a**

SoiMte USDA NPCS Soil Sirvey o» AHegary  
County Maryland 1977



**Soils Mapping Units for Washington County**

Brigadier General Thomas B. Baker Training Facility, Maryland

**Figure 3-2b**

Source USDA NRCS Soil Survey of Washington County Maryland \*962

**Table 3-3**  
**Soils Mapped on TBBTF - General Characteristics**

Soil Series Map Unit	Texture/Parent Material	Drainage Class	Hydric Class	Limitations	Landscape Position
<b>Soils Mapped in Allegany County</b>					
Allegany SiL 8-15% slopes, moderately eroded	A1C2 surface: FSL subsoil: hvy FSL, CL PM: acid shale and sandstone	well drained	no	severe erosion hazard; slope	high terraces above major streams
Calvin channery SiL, 0-10% slopes	CaB surface: shaly SiL subsoil: shaly SiL PM: shale, siltstone, sandstone	well drained	no	rock fragments (channers)	ridges
Calvin channery SiL, 10-20% slopes	CaC surface: shaly SiL subsoil: shaly SiL PM: shale, siltstone, sandstone	well drained	no	slope; rock fragments (channers)	ridges
Calvin shaly SiL, 0-10% slopes, moderately eroded	C1B2 surface: shaly SiL subsoil: shaly SiL PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard; limited available water capacity	ridges
Calvin shaly SiL, 10-20% slopes, moderately eroded	C1C2 surface: shaly SiL subsoil: shaly SiL PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard	ridges
Calvin shaly SiL, 20-30% slopes, moderately eroded	C1D2 surface: shaly SiL subsoil: shaly SiL PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard	ridges

Soil Series	Map Unit	Texture/Parent Material	Drainage Class	Hydric	Limitations	Landscape Position
Calvin shaly SiL, 30-45% slopes	C1E	surface: shaly SiL subsoil: shaly SiL PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard	ridges
Cut and Fill Land	Cv	-	-	no	onsite investigation needed to determine uses and limitations	-
Dekalb and Lelew very stony soils, 25-45% slopes	D1E	surface: L, SL, FSL subsoil: hvy SL, SL PM: sandstone	well drained	no	slope; stoniness	mountainous areas
Dekalb and Lelew very stony soils, 45-75% slopes	D1F	surface: L, SL, FSL, subsoil: hvy SL, SL PM: sandstone	well drained	no	slope; stoniness	steep mountain sides
Edom SiL, 3-8% slopes, moderately eroded	EdB2	surface: SiL subsoil: SiCL PM: limestone	well drained	no	moderate erosion hazard	ridges
Gilpin channery SiL, 0-10% slopes, moderately eroded	GnB2	surface: SiL subsoil: SiL, SiCL PM: acid shale, siltstone, sandstone	well drained	no	moderate erosion hazard; shallow to rock	uplands
Gilpin channery SiL, 10-20% slopes, moderately eroded	GnC2	surface: SiL subsoil: SiL, SiCL PM: acid shale, siltstone, sandstone	well drained	no	severe erosion hazard; shallow to rock	uplands
Gilpin channery SiL, 20-30% slopes, moderately eroded	GnD2	surface: SiL subsoil: SiL, SiCL PM: acid shale, siltstone, sandstone	well drained	no	very severe erosion hazard; shallow to rock	uplands

Soil Series	Map Unit	Texture/Parent Material	Drainage Class	Hydric	Limitations	Landscape Position
Gilpin channery SiL, 30-45% slopes	GnE	surface: SiL subsoil: SiL, SiCL PM: acid shale, siltstone, sandstone	well drained	no	very severe erosion hazard; slope; shallow to rock	uplands
Gilpin and Weikert very stony SiL, 10-30% slopes	Gwf	surface: SiL subsoil: SiL, SiCL PM: acid shale, siltstone, sandstone	well drained	no	stoniness; slope; shallow to rock	uplands
Lehew very stony L, 10-30% slopes	LID	surface: L subsoil: L, SCL PM: sandstone, shale	well drained	no	stoniness; slope; erosion hazard	mountainous areas
Nolo SiL, 3-10% slopes	NoB	surface: SiL, L subsoil: CL PM: sandstone, shale, siltstone	poorly drained	yes	wetness; erosion	uplands
Pope SiL	Ps	surface: FSL subsoil: FSL PM: sandstone and shale	well drained	no	flooding hazard	broad, flat flood plains
Rock outcrop	Rc	PM: sandstone, shale, siltstone	-	no	not suitable for most uses	-
Weikert shaly SiL, 0-10% slopes, moderately eroded	WeB2	surface: shaly SiL subsoil: very shaly SiL PM: acid shale, siltstone, some sandstone	somewhat excessively drained	no	droughtiness; stoniness; abundant shale fragments	rolling to very steep ridges
Weikert shaly SiL, 10-20% slopes, moderately eroded	WeC2	surface: shaly SiL subsoil: Very shaly SiL PM: acid shale, siltstone, some sandstone	somewhat excessively drained	no	very severe erosion hazard; droughtiness; stoniness; abundant shale fragments	rolling to very steep ridges

Soil Series	Map Unit	Texture/Parent Material	Drainage Class	Hydric	Limitations	Landscape Position
Weikert shaly SiL, 20-45% slopes	WeE	surface: shaly SiL subsoil: very shaly SiL PM: acid shale, siltstone, some sandstone	somewhat no excessively drained		very severe erosion hazard	rolling to very steep ridges
Weikert and Gilpin channery SiL, 45-65% slopes	WnF	surface: shaly/channery SiL subsoil: shaly/channery SiL PM: acid shale, siltstone, some sandstone	somewhat no excessively drained		very severe erosion hazard	rolling to very steep ridges

**Soils Mapped in Washington County**

Berks channery L, ridges, 10-20%, moderately eroded	BcC2	surface: channery L, channery SiL subsoil: very channery L PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard; slope	ridges
Berks soils, ridges, 30-60% slopes	BoF	surface: channery L, channery SiL subsoil: very channery L PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard; slope	ridges
Berks soils, ridges, 20-45% slopes, severely eroded	BoE3	surface: channery L, channery SiL subsoil: very channery SiL PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard	ridges



Soil Series	Map Unit	Texture/Parent Material	Drainage Class	Hydric	Limitations	Landscape Position
Calvin channery L, 3-10% slopes, moderately eroded	CcB2	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard	uplands
Calvin channery L, 10-20% slopes, moderately eroded	CcC2	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard; slope	uplands
Calvin channery L, 20-30% slopes	CcD	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard; slope	uplands
Calvin channery L, 45-60% slopes	CcF	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	slope; severe erosion hazard	uplands
Calvin shaly L, 0-10% slopes, moderately eroded	CmB2	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard	uplands
Calvin shaly L, 10-20% slopes, moderately eroded	CmC2	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	moderate erosion hazard; slope	uplands

Soil Series	Map Unit	Texture/Parent Material	Drainage Class	Hydric Limitations	Landscape Position	
Calvin channery L, 10-20% slopes, severely eroded	CmC3	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard; slope	uplands
Calvin shaly L, 20-30% slopes	CmD	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	severe erosion hazard; slope	uplands
Calvin shaly L, 30-45% slopes	CmE	surface: channery SiL subsoil: very channery SiL, very channery L PM: shale, siltstone, sandstone	well drained	no	slope; severe erosion hazard	uplands
Edgemont and Laidig very stony L, 5-35% slopes	EgD	surface: very stony L, subsoil: channery L, channery SCL PM: colluvial material	well drained	no	cutbank caving; slope	uplands
Eroded land, shale and schist materials	Es	surface: stony SL subsoil: channery SL, channery L PM: quartzite, metaquartzite, quartz schist, conglomerate	well drained	no	erosion hazard; shallow to rock; slope	uplands
Holston gravelly L, 8-15% slopes, moderately eroded	HrC2	surface: L subsoil: CL PM: alluvial material	well drained	no	moderate erosion hazard; slope	terraces, footslopes, alluvial fans



Soil Series	Map Unit	Texture/Parent Material	Drainage Class	Hydric	Limitations	Landscape Position
Holston SiL, 3-8% slopes, moderately eroded	HtB2	surface: L subsoil: CL PM: alluvial material	well drained	no	moderate erosion hazard	terraces, footslopes, alluvial fans
Holston SiL, 8-15% slopes, moderately eroded	HtC2	surface: L subsoil: CL PM: alluvial material	well drained	no	moderate erosion hazard	terraces, footslopes, alluvial fans
Montevello shaly L, 20-30% slopes, moderately eroded	MmD 2	surface: channery SiL subsoil: very shaly SiL PM: shale, siltstone, sandstone	somewhat excessively drained	no	shallow to rock; slope; moderate erosion hazard	uplands
Monongahela SiL, 3-8% slopes, moderately eroded	MhB2	surface: SiL subsoil: SiL, L PM: alluvial material	moderately well drained	hydric incl.	wetness; moderate erosion hazard; fragipan at 22 inches	terraces
Monongahela SiL, 8-15% slopes, moderately eroded	MhC2	surface: SiL subsoil: SiL, L PM: alluvial material	moderately well drained	hydric incl.	wetness; moderate erosion hazard; fragipan at 22 inches	terraces
Pope FSL	Pn	surface: FSL subsoil: FSL PM: acid alluvial material	well drained	no	flooding; cutbank caving	floodplains

Sources: USDA, 1977; USDA, 1962

Note:

L = loam  
SL = sandy loam  
FSL = fine sandy loam  
SCL = sandy clay loam  
SiL = silt loam  
SiCl = silty clay loam  
CL = clay loam  
PM = parent material

Soil information for TBBTF indicates that there is a moderate to very severe potential for erosion for the majority of soil mapping units that occur on the installation (see Table 3-3). Due to a high degree of topographic variation within soil mapping units, there is

Figure 3-2a, Figure 3-2b and Table 3-3 provide a good general characterization of soil conditions on TBBTF and are useful tools in determining use and management of the resource. Where proposed activities will directly affect soils, or the viability of a proposed use is dependent on soil conditions, on-site soil characterization should be conducted.

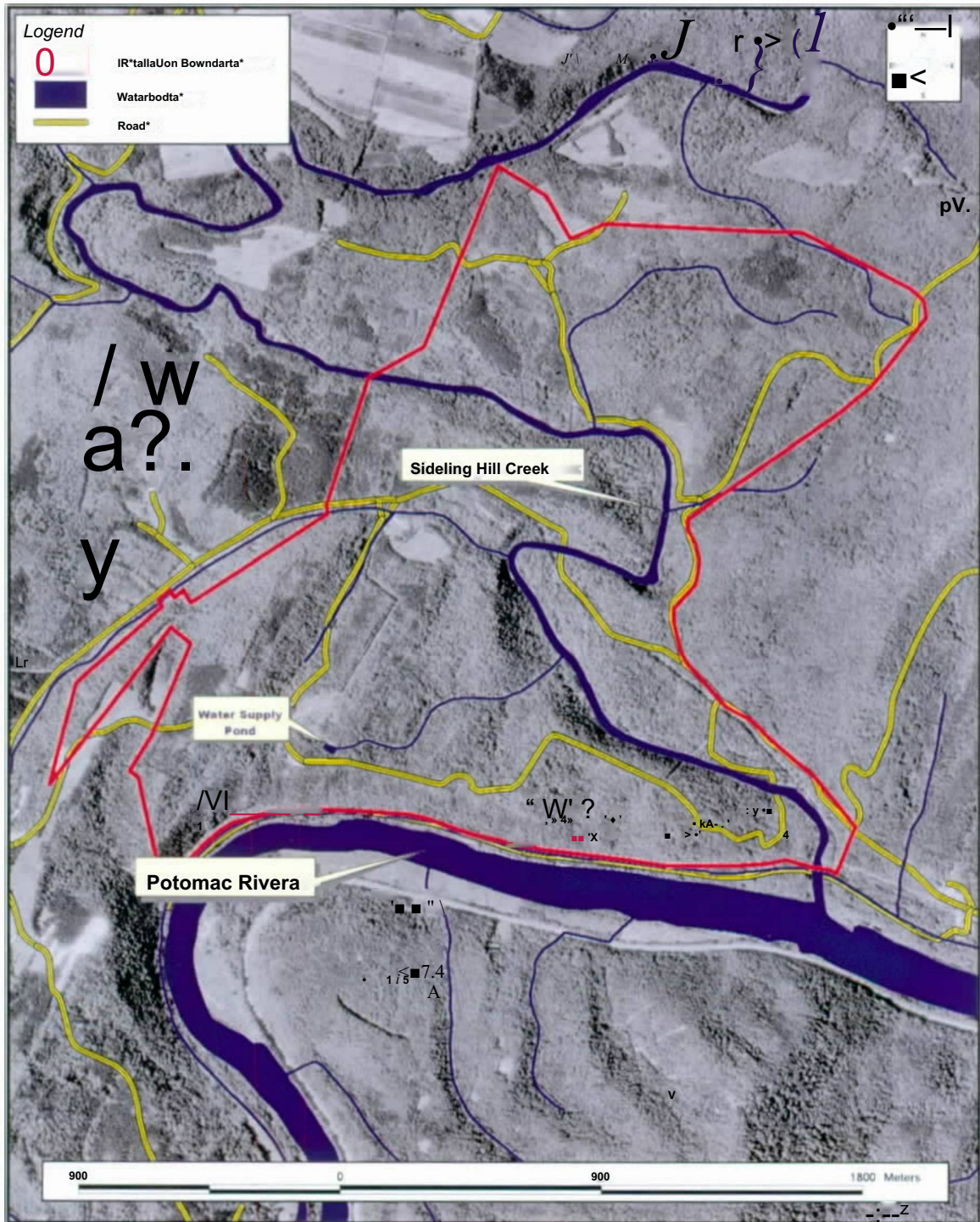
### **3.8 WATER RESOURCES**

#### **3.8.1 Surface Water**

Surface water features on TBBTF are characterized by perennial and intermittent streams, and one man-made pond (see Figure 3-3). The C&O Canal and the Potomac River are located along the southern boundary of TBBTF.

TBBTF is located in the Sideling Hill Creek Subwatershed which drains into the Potomac River. The watershed encompasses approximately 66,682 acres and is a fourth order watershed and stream system. Approximately 15,400 acres are located in Maryland with the remaining area in Pennsylvania. In Maryland, approximately 80 percent of the area is dominated by a mixed hardwood forest ecosystem, 11 percent is in agricultural production and five percent is in developed land. The DNR maintains 5,294 acres of public land within the watershed (Rohrback, 1997).

The most significant surface water feature on TBBTF is Sideling Hill Creek, which flows for a distance of approximately two miles across the training facility. The creek flows onto TBBTF along its northwestern boundary, flows east across the north central section of the training facility, and then meanders south near the eastern boundary (see Figure 3-3). Sideling Hill Creek flows into the Potomac River at the southeastern corner of TBBTF. The width of the creek ranges from approximately 15 feet in riffle areas to 50 feet at some pools. The depth of Sideling Hill creek ranges from a few inches to more than six feet in some of the deeper pools during normal flow periods. The stream on TBBTF is protected by a wooded riparian buffer of old forest and steep shale slopes. The water clarity is usually very clear except for periods after heavy rains when water levels rise and sediment influx from upstream occurs (Bartgis, 1996). In January of 1996, severe flooding occurred on Sideling Hill Creek. The flood, which was characteristic of a 100-year event, resulted in major reworking of the stream's substrate, with severe scouring and deposition of woody debris in habitats occurring along and adjacent to the stream. Water levels along the stream remained well above normal throughout most of 1996 as a result of unusually heavy rainfall in the spring, summer, and fall of that year (Bartgis, 1996). Sideling Hill Creek supports the largest population of the federally endangered emergent plant harperella (*Ptilimnium viviparum*) in Maryland and one of the largest and most defensible populations remaining for the species rangewide (Bartgis, 1996). Habitat conservation activities in Maryland are concentrated on Sideling Hill Creek, represented by a cooperative effort between TNC, Maryland Natural Heritage and Wildlife Diversity Program, and USFWS. A significant portion of the harperella population in Maryland occurs in the reach of Sideling Hill Creek that occurs on TBBTF (see Sections 3.11 and 3.16).



**Surface Water Features**

**Figure 3-3**

Brigadier General Thomas B. Baker Training Facility, Maryland

Source: ESRI and US Geological Survey

TNC began efforts to protect Sideling Hill Creek in 1990, and currently owns almost 700 acres in the watershed. In May 2001, TNC will open its Allegheny Forests Project office to focus on protecting plants, animals and natural communities in western Washington and eastern Allegheny counties, including Sideling Hill Creek.

Several small unnamed intermittent streams flow into Sideling Hill Creek on TBBTF (see Figure 3-3). Two intermittent streams flow into Sideling Hill Creek from the western side of the training facility. One stream, with its headwaters in the south central section of TBBTF, flows to Sideling Hill Creek through a narrow and steep valley. The other stream flows onto TBBTF at its west central boundary and generally follows Ziegler Road until it enters Sideling Hill Creek in the central section of the facility. Three intermittent streams, with their headwaters on Sideling Hill, also flow into Sideling Hill Creek from the eastern side of the facility. One stream originates off of TBBTF and enters Sideling Hill Creek near the east central boundary of the facility. Another flows west across the northern section of the facility and then south along Allegheny Line Road and into Sideling Hill Creek. The third stream originates on Sideling Hill near the northeastern corner of the training facility then flows west along the northern boundary for about 2,000 feet, then north off TBBTF and into Sideling Hill Creek to the north of the installation.

The man-made pond located in the south central section of TBBTF in the field adjacent to Straus Lodge was excavated to provide a source of water for fire control. The pond is approximately 50 feet by 100 feet in size and contains bass and bluegills.

### **3.8.2 Ground Water**

The Valley and Ridge Physiographic Province in Allegheny and Washington Counties has been divided into five ground water provinces based on major geologic features. The ground water provinces from east to west include the Hagerstown Valley, Hancock-Indian Springs, Sideling Hill-Town Creek, Warrior-Evitts Mountain, and Cumberland. TBBTF is located in the Sideling Hill-Town Creek ground water province, which extends from Sideling Hill westward 12 miles to the east flank of Warrior Mountain. With the exception of three sandstone ridges, the province is underlain almost entirely by Devonian and Mississippian shales (MD Dept, of Geology, Mines and Water Resources, 1961).

Ground water in the Sideling Hill-Town Creek province comes primarily from the extensive shales that underlie most of the province. Ground water yields are low but typically are sufficient for farm and domestic uses. The more productive wells are located in draws or in valleys near major streams. Aquifer tests and statistics on well yields indicate little difference in the hydrologic properties of the different shale units (MD Dept, of Geology, Mines and Water Resources, 1961).

Ground water reservoirs in the Sideling Hill-Town Creek province are recharged primarily by local precipitation. The amount of recharge is governed in part by the capacity of the soil and rocks to receive and transmit water. Shale typically has a low permeability and storage capacity and movement of water occurs mainly through small

interconnecting fractures and parting planes in the rock. The soils derived from the underlying shales have a low moisture holding capacity and they tend to form a hard surface crust which impedes the downward movement of water. Little data is available concerning the storage capacity or specific yield of the shales in the province, but it is believed to be low (MD Dept, of Geology, Mines and Water Resources, 1961).

The water table in the Sideling Hill-Town Creek province parallels the topography in a subdued manner. Water table levels range from two to 110 feet below the surface. The depth to the water table is greatest on the tops of ridges and isolated hills and the least near the valley floors of major streams. Ground water in the province occurs primarily under water table conditions (MD Dept, of Geology, Mines and Water Resources, 1961).

### **3.9 WETLANDS**

A reconnaissance level assessment of wetlands on TBBTF was conducted on March 29 and May 18 and 19 of 2000. The purpose of the assessment was to identify wetlands on the facility and to map their general locations. Determination of the occurrence of wetlands was based on the presence of three criteria (hydric soils, hydrophytic vegetation and hydrology) established in the U.S. Army Corps of Engineers Wetland Delineation Manual (1987) and related technical policy guidance. Figure 3-4 shows the general locations of the wetlands identified during the survey.

A planning level wetland survey was conducted by the U.S. Army Engineer Research and Development Center Waterways Experiment Station on TBBTF on September 23, 1999. No wetlands were identified on the facility in areas characterized during the survey. The study stated that caution should be taken within a 100-foot buffer on either side of the streams on TBBTF for the presence of wetland areas including seasonal and perennial wetlands, intermittent and perennial tributaries and ponds (USAERDC, 2000). Wetlands identified in the reconnaissance level assessment conducted on March 29 and May 18 and 19 of 2000 include seasonal and perennial wetlands described in the planning level wetland survey conducted on September 23, 1999.

Two wet areas were identified along the Lower Sideling Hill Creek Floodplain (see Figure 3-5). These areas are designated as wetland 1 (PFO1/5A) and wetland 2 (PFO1 A). Indicators of wetland hydrology and a dominance of wetland vegetation occur in both wetlands. However, soils observed at the locations did not exhibit characteristics typically associated with hydric soils. In addition, the soils on the floodplain in the area are mapped as the Pope .fine sandy loam, a well drained floodplain soil that is subject to flooding. Surface water was observed in both wetland areas on the March 29 site visit and in areas on wetland 2 on the May 18 and 19 site visits. Additional, more comprehensive characterization of these areas would be necessary to determine if atypical conditions occur at the site and the wet areas represent jurisdictional wetlands as per US Army Corps of Engineers (USACE) guidelines. Based on initial characterization of the sites the areas exhibit hydrologic characteristics for long enough during the growing season to be considered jurisdictional wetlands. In addition, the dominant vegetation occurring in both wet areas was either obligate wetland (99% probability of

occurrence in a wetland) or facultative wetland (67%-99% probability of occurrence in a wetland).

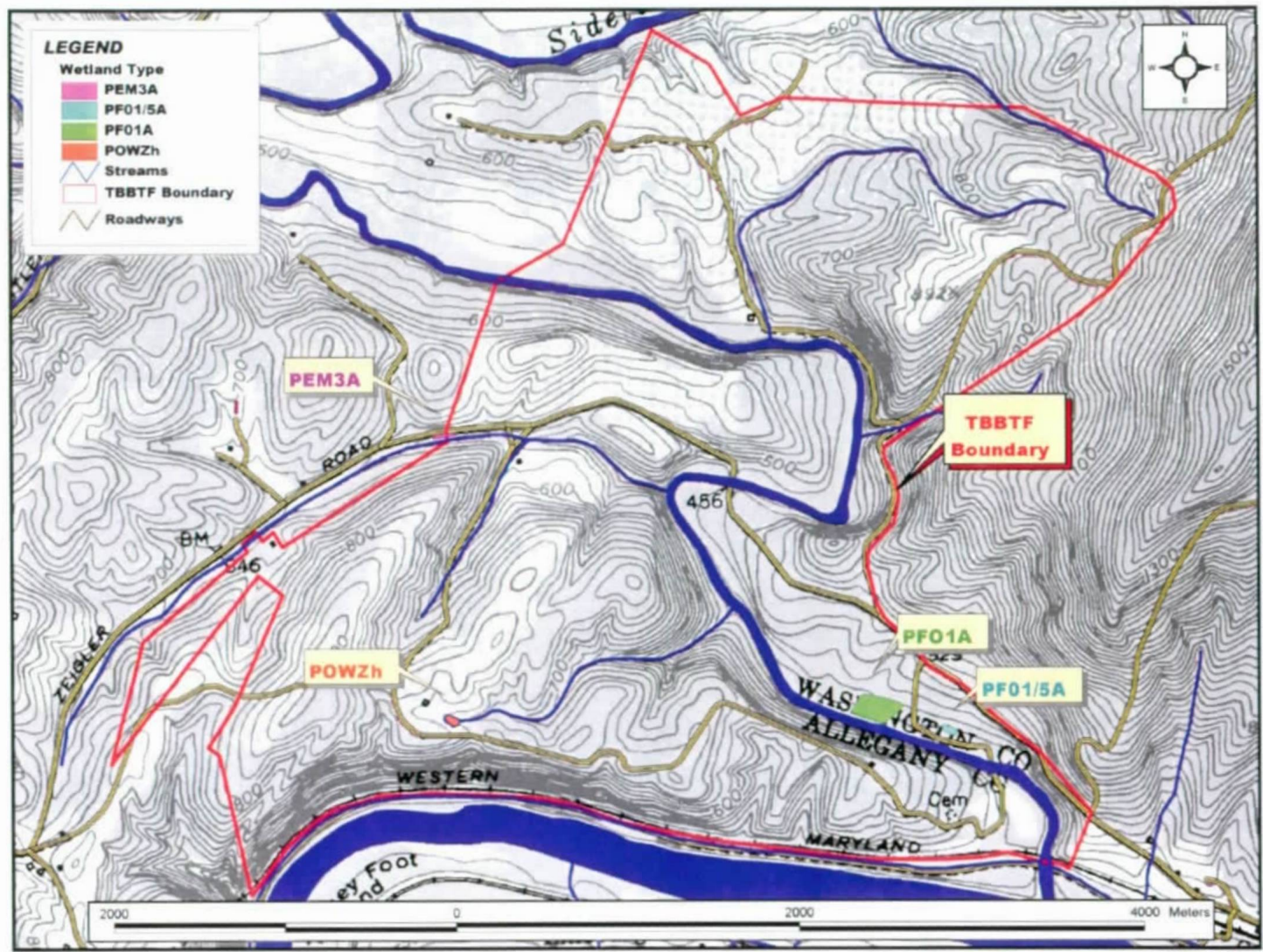
Based on the Cowardin Classification System (Cowardin et al., 1979) wetland 1 is a palustrine forested broad leaved deciduous/dead temporarily flooded habitat (PFO1/5A). The wetland is approximately .25 acres in size. Most of the trees located in the wet area are dead. A few living trees still occur in wetland including sycamore (*Plantanus occidentalism*), tulip poplar (*Lyriodendron tulipifera*), river birch (*Betula nigra*), and elm (*Ulmus* sp.). Shrubs and vines occurring in the wetland include: spice bush (*Lindera benzoin*), poison ivy (*Toxicodendron radicans*), and multiflora rose (*Rosa multiflora*). Herbaceous vegetation dominates the wetland. The dominant herbaceous vegetation in the wet area includes squarrose sedge (*Carex squarrosa*), sensitive fem (*Onoclea sensibilis*) Virginian chain fem (*Woodwardia virginica*), jewelweed (*Impatiens* sp.), wingstem (*Verbesina alternifolia*), false nettle (*Boehmeria cylindrica*), and very slender sedge (*Carex gracillima*). Wild onion (*Allium canadense*) occurs as a dominant mixed in with squarrose sedge in dryer habitat surrounding the wetland. The source of hydrology for wetland 1 is from seeps and runoff from adjacent uplands associated with Sideling Hill.

Wetland 2 is a palustrine forested broad leaved deciduous temporarily flooded habitat (PFO1A). The area designated as wetland 2 in Figure 3-5 consists of an approximately two acre mosaic of wetland and upland habitats. Potential vernal pools occur in the wetter areas of wetland 2. Dominant trees in the wetter areas include river birch and elm. Shrubs and vines in the wetter areas include spice bush, multiflora rose and poison ivy. Herbaceous vegetation in the wetter areas is sparse and includes jewelweed, soft rush (*Juncas effusus*), and several unidentified grasses. Dominant trees in the drier areas of the mosaic include river birch, tulip poplar, and elm. Shrubs dominating the drier areas include spice bush, Virginia creeper (*Parthenocissus quinquefolia*), multiflora rose and poison ivy, and herbaceous vegetation dominating the dryer areas includes microstegium (*Microstegium vimineum*), rough bedstraw (*Galium asprellum*), rough cinquefoil (*Potentilla norvegica*), wild onion, sensitive fem, and several unidentified grasses. The source of water for the mosaic wetland is from seeps and runoff from adjacent uplands associated with Sideling Hill.

Wetland 3 is a small, approximately .15 acre, palustrine emergent narrow leaved nonpersistant temporarily flooded wetland (PEM3A) that occurs along a drainage ditch adjacent to Ziegler Road. Dominant vegetation in the wetland includes wool grass (*Scirpus cyperinus*) and sensitive fem.

Wetland 4 is the water supply pond located in the field adjacent to Straus Lodge. The approximately .175 acre pond is designated as a palustrine open water intermittently exposed/permancnt diked/impounded wetland (POWZh) on the National Wetland Inventory Map for Bellgrove, MD-PA-W. VA. The pond consists predominantly of open water habitat with small areas of emergent vegetation dominated by cattails along its shoreline.





**Wetlands**

Brigadier General Thomas B. Baker Training Facility, Maryland

Figure 3-4

Source TM Lou\* Berger Group 200 uSGS 7 5 Mruxe Senee Toogrpn< Uep Beitegrove MD-PA-WVA 1974

Riverine wetlands occur at several locations in Sideling Hill Creek. The riverine wetlands are not shown in Figure 3-4 because their locations and extent may change over time based on prevailing weather conditions and stream dynamics. Dense stands of water willow characterize several of the riverine wetlands that occur along the creek. The federally endangered emergent plant harperella is typically found in association with the water willow stands. Other aquatic and emergent plants found in association with the riverine wetlands in Sideling Hill Creek include: golden club (*Orontium aquaticum*), grass-leaved pondweed (*Potamogeton gramineus*), variable-leaved pondweed (*Potamogeton diversifolius*), Eurasian naiad (*Najas minor*), Canada waterweed (*Elodea canadensis*), arrowhead (*Sagittaria* sp.), quillwort (*Isoetes* sp.), water starwort (*Callitriche* sp.), twisted carex (*Carex torta*), hop-like sedge (*Carex lupidina*), freshwater cordgrass (*Spartina pectinata*), whitegrass (*Leersia virginica*), ditch stonecrop (*Penthorum sedoides*), cespitose smartweed (*Polygonum caespitosum*), Pennsylvania smartweed (*Polygonum pennsylvanicum*), water smartweed (*Polygonum punctatum*), mild water pepper (*Polygonum hydropiperoides*), southern marsh bellflower (*Campanula aparinoides* var. *aparinoides*), small-headed beak rush (*Rhynchospora capitellata*), turtlehead (*Chelone glabra*), purple leaved willow herb (*Epilobium coloratum*), yellow nutsedge (*Cyperus escidentus*), sharpwing monkey-flower (*Mimulus alatus*), Alleghany monkey flower (*Mimulus ringens*), autumn fimbriatylis (*Fimbristylis autumnalis*), many leaved bulrush (*Scirpus polyphyllus*), fringed loosestrife (*Lysimachia ciliata*), bulbil loosestrife (*Lysimachia terrestris*), and yellow sneezeweed (*Helenium autumnale*). Amblystegiaceae (*Leptodictyum riparium*), an aquatic moss adapted to periodic desiccating conditions, occurs at the base of some of the north facing rock outcrops at the water line along the creek (MDNHP, 1995).

Exotic invasive plant species occur in, and adjacent to, wetlands 1 and 2 (see Figure 3-4). Young multiflora rose shrubs are common in the areas of both wetlands. Over time, the multiflora rose will establish dense impassable populations if they are not managed. Microstegium is also common in the areas surrounding the wetland habitats. The invasive grass has the potential to outcompete natural vegetation in areas of the wetlands that are not subject to extended periods of inundation (see Sections 3.15 and 5.13.1.2 for discussion and management of exotic invasive plant species on TBBTF).

### 3.9.1 Vernal Pools

Vernal pools are temporary bodies of freshwater that provide critical habitat for many vertebrate and invertebrate wildlife species. The pools typically cycle annually from flooded to dry and appear year after year at the same locations, except in exceptionally dry years. Most vernal pools are filled by spring rains and snowmelt, and dry up during the summer months. Many vernal pools, however, are filled by rainwater in the fall and may persist throughout the winter. Vernal pools may also exist as a result of seasonally high groundwater tables.

Vernal pools do not support fish populations because they are temporary bodies of water. Several wildlife species, including some that have evolved breeding strategies intolerant of fish predation on their eggs and larvae, are totally dependent on vernal pools for their survival. In particular, mole salamanders and wood frogs rely on vernal pools for



breeding. Many other species of amphibians utilize vernal pools for breeding and nonbreeding functions, although they are not restricted to the habitat. The many diverse types of invertebrates that inhabit vernal pools provide important food for various species of birds, mammals, reptiles, and amphibians. Areas in the immediate vicinity of vernal pools provide species with important nonbreeding habitat functions such as feeding, shelter, and overwintering sites.

Vernal pools occur in association with other wetlands in the abandoned wet pasture section of the Lower Sideling Hill Creek Floodplain located downstream of the Ziegler Road Bridge (see Section 3.9). Large populations of tadpoles have been observed in these seasonal pools in mid-May (MDNHP, 1995). Vegetation observed in the vernal pools includes red woolgrass (*Scirpus rubricosus*), wild onion (*Allium canadense*), rose-like sedge (*Carex rosea*), crowded sedge (*Carex stipata*), one-flowered cancerroot (*Orobanche uniflora*), and very slender sedge (*Carex gracillima*). Observations were made at the locations of the vernal pools on March 30 and again on May 12 and 18, 2000. The vernal pools had approximately one to three inches of standing water in them on March 30. No wildlife were observed in the pools during the March 30 site visit. There was no surface water observed in the pools during the May 12 and 18 site visits and no wildlife were observed using the pool areas. Lower than normal precipitation over the past couple of years could account for the early loss of surface water in the vernal pools on TBBTF.

### 3.10 RIPARIAN AREAS

Riparian areas display characteristics of terrestrial and aquatic habitats. They are generally characterized by the presence of surface or subsurface water, water flowing through a natural channel, plants requiring readily available water and soils derived from alluvium. The extent of riparian areas is limited to where the water influences the land surrounding the water body.

Riparian areas associated with Sideling Hill Creek on TBBTF provide a diverse variety of physical characteristics ranging from flat lying floodplains to vertical cliffs. The riparian zone along the upstream section of Sideling Hill Creek on its north bank (left) is characterized by a generally flat floodplain bounded by gentle slopes that extend upward from the floodplain. The banks extending up from the floodplain face to the south, exposing them to longer periods of sunlight. As a result of the bank's aspect, the soils in this area of the riparian zone have a moist to dry mesic gradient. The forested floodplain in this area is characterized by white ash (*Fraxinus americana*), sycamore (*Plantanus occidentalis*), tulip poplar (*Liriodendron tulipifera*), river birch (*Betula nigra*), and several oaks (*Quercus* sp.). Understory and shrub vegetation in the floodplain is characterized by spicebush (*Lindera benzoin*), paw paw (*Asimina triloba*), musclewood (*Carpinus caroliniana*), witch hazel (*Hamamelis virginiana*), and redbud (*Cercis canadensis*). The riparian forest above the floodplain is characterized primarily by oaks including chestnut oak (*Quercus prinus*), red oak (*Quercus rubra*), white oak (*Quercus alba*), and some mockernut hickory (*Carya tomentosa*) (see Sections 3.13 and 3.15 for additional plant species occurring in the area) (MDNHP, 1995).

The riparian zone along the upstream section of Sideling Hill Creek on its right bank is characterized by a somewhat flat, east facing floodplain and a steep to very steep north facing slope. Soils on the steep slopes have a mesic to dry mesic gradient; Vegetation in the forested floodplain is characterized by red oak, white ash, sycamore, black cherry (*Prunus serotina*), tulip poplar, and river birch. The understory is dense and is characterized by spicebush, musclemwood, witch hazel, and redbud. Herbaceous species in the floodplain include wing stem (*Verbesina alternifolia*), deertongue (*Panicum clandestinum*), Virginia wild rye (*Elymus virginicus*), Virginia creeper (*Parthenocissus quinquefolia*), jewelweed (*Impatiens* sp.), May apple (*Podophyllum peltatum*), and common greenbrier (*Smilax rotundifolia*). The lower slopes in the riparian area are characterized by a combination of wet exposed rock faces and a steep hemlock (*Tsuga canadensis*) forest with an understory of great laurel (*Rhododendron maximum*) and various herbs such as jewelweed and maidenhair fern (*Adiantum pedatum*). Upper slopes are drier and characterized by hemlock, which grades into an oak forest on the ridge top (see Sections 3.13 and 3.15 for additional plant species occurring in the area) (MDNHP, 1995).

The left bank of Sideling Hill Creek adjacent to the Big Pool (see Figure 3-5) is characterized by a near vertical escarpment greater than 200 feet in height. The escarpment is characterized by barren rock faces, some covered with moss. A variety of small trees grow in the crevices including chestnut oak, white basswood (*Tilia heterophylla*), and white ash. Shrubs occurring on the escarpment include American hydrangia (*Hydrangia arborescens*), ninebark (*Physocarpus obovatus*), native bush honeysuckle (*Diervilla lonicera*), Appalachian gooseberry (*Ribes rotundifolium*), flowering raspberry (*Rubus odoratus*), downy arrowwood (*Viburnum rafinesquianum*), and choke cherry (*Prunus virginiana*) (MDNHP, 1995).

Downstream from the Big Pool the left bank of the riparian zone is characterized by a narrow seasonal floodplain and a relatively level to rolling forested slope. Historically, the downstream section of the floodplain was cleared and fenced for pasture. Trees in this section of the floodplain consist primarily of early successional species such as black cherry, river birch, white ash, sycamore, red maple, box elder, tulip poplar, and black locust (*Robinia pseudoacacia*). Overstory vegetation on the side slopes is characterized by elms (*Ulmus* sp.), pignut hickory (*Carya glabra*), red oak, and bladdernut (*Staphylea trifoliata*). Vernal pools occur in the abandoned wet pasture (see Section 3.9.1 for additional discussion of vernal pools) (MDNHP, 1995).

Upstream of the abandoned pasture area the floodplain is characterized by a variety of herbaceous species, some of which include plantain leaved pussytoes (*Antennaria plantaginifolia*), shale barren pussytoes (*Antennaria plantaginifolia*), rattlesnake fern (*Botrychium virginianum*), crested iris (*Iris cristata*), rough bedstraw (*Gallium asprellum*), interrupted fern (*Osmunda claytoniana*), and numerous sedges (*Carex* spp.). Herbaceous plants occurring on the wooded terraces above the floodplain include species typical of mesic to xeric woodlands including four leaved milkweed (*Asclepias quadrifolia*), lady fern (*Athyrium filix-femina*), dwarf hawthorn (*Crataegus uniflora*), wild comfrey (*Cynoglossum virginianum*), wild licorice (*Galium circaeazans*), and several

varieties of sedges (see Sections 3.13 and 3.15 for additional plant species occurring in the area) (MDNHP, 1995).

The riparian area on the right bank of Sideling Hill Creek downstream from the Ziegler Road Crossing is characterized by steep slopes that extend up from the creek's bank. The slopes face north/northeast and, therefore, receive less sunlight during the day. A relatively cool temperature regime and moist to dry mesic moisture gradient occurs in this area. Near vertical slopes in shaded cool locations along the creek are very moist and in some places have lush vegetation. Exposed bedrock along the creek supports various mosses and Christmas fern (*Polystichum acrostichoides*) is common. The dominant trees along the lower slopes are hemlocks with some red oaks present. Dense scattered patches of great laurel occur in the understory (MDNHP, 1995).

The riparian zone at the mouth of Sideling Hill Creek at the confluence with the Potomac River extends off of TBBTF and into the C&O Canal National Historical Park. The floodplain of the Potomac River in this area has moist to dry mesic soils with a mature, well-developed canopy of boxelder, sycamore, and silver maple (*Acer saccharinum*). Typical floodplain shrubs and herbaceous species occurring in this area include poison ivy (*Toxicodendron radicans*), spicebush, jewelweed, Virginia creeper, and Virginia wild rye. Riverbank sandbars occur at the mouth of Sideling Hill Creek and along the Potomac River. The sandbars are characterized by open sandy soils that are exposed to frequent disturbance from flooding. The unstable character of the sandbars limits the types of vegetation that can persist on them. Plant species found on the sandbars include tree seedlings of sycamore and river birch along with various grasses and sedges. Dense stands of water willow (*Justicia americana*) persist at the water's edge (MDNHP, 1995).

The riparian zone associated with Sideling Hill Creek on TBBTF is completely within the RUA. Training activities are restricted within 100-meters of both banks of the stream. Cutting of vegetation in the area is prohibited. Hunting is permitted on the east side of the creek and prohibited on the west and fishing is permitted in the stream. Onsite impacts to the riparian zone along Sideling Hill Creek, associated with training activities, are minimal due to restricted access.

The riparian zone associated with the Potomac River and the C&O Canal along the southern boundary of TBBTF is outside the boundary of the facility.

### **3.11 AQUATIC HABITATS**

Aquatic habitats on TBBTF include Sideling Hill Creek, several small unnamed tributary streams that flow into the Sideling Hill Creek, and a man-made pond.

Sideling Hill Creek meanders from mountain slopes in south central Pennsylvania through steep cliffs, sloping woods, and farmland before flowing into the Potomac River at the southeast corner of TBBTF. The creek flows for approximately two miles across TBBTF before flowing into the Potomac River. The slope of the creek on TBBTF is gentle, and under normal conditions, flow is relatively smooth. Flow varies seasonally and daily particularly during periods of drought and heavy rain. The water clarity is

usually very clear except for periods after heavy rains when water levels rise and sediment influx from upstream occurs. In the spring, runoff from precipitation and snowmelt creates fast moving currents and deep pools. In the summer, shallow sections of the stream may completely dry up, but the deeper pools always persist (MDNHP, 1995).

Sideling Hill Creek supports a rich diversity of species and habitats and remains one of the healthiest streams in central Appalachia (Boyle and MacIvor, 1995). The creek is relatively inaccessible along much of its length due to the physical characteristics of the area. Sideling Hill Creek is bordered at many locations by steep shale cliffs that act as natural barriers and limit intensive activities, such as logging or farming along its banks. As a result, the forested buffer remains intact along much of the stream. The buffer helps keep Sideling Hill Creek healthy by limiting nonpoint source pollution, such as sediment in runoff, from reaching the stream.

The dominant fauna associated with the aquatic habitats of Sideling Hill Creek include various fish species. The fish are important both ecologically and recreationally. Twenty one species of fish were recorded in Sideling Hill Creek in a four mile reach of the stream that flows through Green Ridge State Forest just upstream of TBBTF. Fish species identified in the creek include common shiner (*Notropis cornutus*), spottail shiner (*Notropis hudsonius*), roseyface shiner (*Notropis rubellus*), creek chub (*Semotilus atromaculatus*), fallfish (*Semotilus coporalis*), white sucker (*Semotilus commersoni*), margined madtom (*Noturus ins ignis*), rock bass (*Ambloplites rupestris*), redbreast sunfish (*Lepomis auritus*), green sunfish (*Lepomis cyanellus*), smallmouth bass (*Micropterus dolomieu*), stoneroller (*Campostoma anomalum*), comely shiner (*Notropis amoenus*), bluntnose minnow (*Pimephales promelas*), longnose dase (*Semotilus cataractae*), creek chubsucker (*Erimyzon oblongus*), longear sunfish (*Lepomis megalotis*), greenside darter (*Etheostoma blenniodes*), rainbow darter (*Etheostoma caeruleum*), fantail darter (*Etheostoma flabellare*), and mottled sculpin (*Cottus bairdi*). Sideling Hill Creek is also stocked annually with rainbow trout (*Oncorhynchus mykiss*) at Green Ridge State Forest (DNR, 1993).

The northern water snake (*Natrix sipedon sipedori*) is common in the water willow beds and wood turtles (*Clemmys insculpta*) use the creek for mating and for hibernation.

The substrate of Sideling Hill Creek is variable, with deep sandy bottoms occurring in pools and a gradient of pebbles, cobbles, boulders, and bedrock occurring in faster moving water. Backwater pools have developed in some creek bends as a result of sediment deposition. The rocky creek bottom interspersed with muddy substrates creates good habitat for freshwater mussels and other aquatic macroinvertebrates.

Survey work conducted on Sideling Hill Creek indicates it supports one of the most diverse and viable freshwater mussel populations in Maryland (Boyle and MacIvor, 1995). Survey work conducted on TBBTF in 1994, identified five species of freshwater mussels, with the most common species identified as the interior squawfoot (*Strophitus undulatus*). The interior squawfoot was found primarily in habitats consisting of sand and gravel substrates in depths from one to two feet of water. The common spike

(*Elliptio producta*) was also found during the survey. The remaining mussel species found on the training facility were identified only by the presence of spent shells. Spent mussel shells identified during the survey included the green floater (*Lasmigona subviridis*), a state endangered species; the Atlantic spike (*Elliptio producta*) and the pocketbook mussel (*Lampsilis* sp.). The triangle floater (*Alasmidonta undulata*) which inhabits slow moving areas of streams in sand and gravel has also been identified in the creek. The Asian clam (*Corbicula fluminea*), a non-native mollusk, occurs in the creek and could pose a future threat to native mussels that occur in the stream (Boyle and MacIvor, 1995).

Aquatic and emergent plants occurring in the creek include golden club, grass-leaved pondweed, variable-leaved pondweed, Eurasian naiad, Canada waterweed, arrowhead, quillwort, and water starwort. Amblystegiaceae (*Leptodictyum riparium*), an aquatic moss adapted to periodic desiccating conditions, occurs at the base of some of the north facing rock outcrops at the water line (MDNHP, 1995). A variety of emergent wetland plants also occur along the banks and in backwater pools along the creek (see Section 3.9 for a discussion of wetlands and associated plants that occur along Sideling Hill Creek).

Harperella, a Federal and state endangered plant species, grows in large numbers among water willow beds and around exposed bedrock along the creek. Sideling Hill Creek supports the second largest population of the plant nationwide and the largest population in Maryland; a major portion of which occurs on TBBTF (see Section 3.16 for additional discussion of rare, threatened and endangered species) (MDNHP, 1995).

Information on aquatic habitats associated with tributary streams to Sideling Hill Creek on TBBTF is lacking.

The man-made pond located in the south central section of TBBTF in the field adjacent to Straus Lodge was excavated to provide a source of water for fire control. The pond is approximately 50 feet by 100 feet in size and contains largemouth bass (*Micropterus salmoides*) and bluegills (*Lepomis* spp.). A small area of emergent aquatic vegetation, dominated by cattails (*Typha* sp.) occurs in the man-made pond.

### 3.12 TERRESTRIAL HABITATS

Based on *Deciduous Forests of Eastern North America* (Braun, 1950), TBBTF is located in the Oak-Chestnut Forest Region. The region, which extends from Pennsylvania to Tennessee, is characterized by a dominance of oaks. The predominant natural vegetation communities found on TBBTF are upland vegetative communities, which include mainly forested areas with a few early successional woodlands, recovering abandoned fields, and open areas. TBBTF is comprised of approximately 1,150 acres of woodland and 48 acres of cleared land.

The characteristics of terrestrial habitats on TBBTF vary depending on site features such as slope, aspect, soil characteristics and past disturbance history. The diverse terrain and fluctuating wet and dry conditions, depending on varying slope, aspect and soil conditions also result in presence of a variety of unique terrestrial habitats on TBBTF.

The facility is dominated by upland habitats characterized by oaks consisting of a variety of species found in dry upland areas including black oak (*Quercus velutina*), white oak, red oak, and chestnut oak. Table 3-4 provides a brief characterization of some the unique types of terrestrial habitats found on the facility (see Section 3.13 for additional discussion of terrestrial habitats on TBBTF).

### 3.13 SENSITIVE AND SIGNIFICANT HABITATS

The following section provides a discussion of sensitive habitats on TBBTF. Habitat types and locations are based on a study and characterizations conducted by the Maryland Natural Heritage and Wildlife Diversity Program (1995) to inventory rare, threatened, and endangered species and sensitive habitats on TBBTF, and are based on field surveys performed in 1993 and 1994. The following section summarizes the findings of the field surveys. Thirteen sensitive or significant sites were identified on TBBTF in the survey (see Figure 3-5). Additional information on rare, threatened, and endangered species and the flora and fauna occurring on TBBTF can be found in Sections 3.9, 3.10, 3.11, 3.12, 3.14, 3.15, and 3.16.

Most of the sensitive habitats identified in the survey are located within the RUA. All locations with federally listed species present are located in the RUA. Where identified sites fall outside of the RUA, TBBTF intends for the areas to remain as parts of the General Use Area, but to avoid the areas, or make additional efforts to minimize impacts that might occur as a result of training or other activities. The following sections provide characterizations of the identified habitats. More in depth discussions of the habitats can be obtained by referencing The Maryland Natural Heritage and Wildlife Diversity Program (1995).

#### 3.13.1 Straus Barren

The Straus Barren is a shale barren located adjacent to the Potomac River along the southwest boundary of TBBTF (see Figure 3-5). The barren begins at the hill adjacent to the C&O Canal and railroad grade and continues upslope to the crest of the ridge. The site is characterized by steep shale slopes and exposed rock faces that support special habitats and plant communities. The barren faces primarily south and has a dry mesic to xeric moisture gradient (MDNHP, 1995).

**Table 3-4**  
**Unique Terrestrial Habitats on TBBTF**

<b>Habitat</b>	<b>General Characteristics</b>
Exposed bedrock along creek banks	bare rocks usually with vertical slopes; plunging into the wet streambed, at least seasonally; with mosses and liverworts

Habitat	General Characteristics
Mesic rock outcrops	bare rocks with vertical, usually north facing, slopes; seasonally wet; mosses common; vascular plants present in crevices where soil has accumulated
Rock outcrops	bare rocks with vertical slopes; dry; vegetation primarily in crevices where soil has accumulated; mosses and lichens present on rock surfaces
Shale barrens	exposed bedrock shale, with patches of loose shale scree; sparse vegetation with species adapted to very hot and dry conditions
Steep vegetated slopes with rock outcrops	rock outcrops in shaded woodlands
Hemlock forests	frequently north facing wooded slopes dominated by eastern hemlock ( <i>Tsuga canadensis</i> )
Riparian floodplains	areas defined by historic stream courses and sediment deposition; infrequently subject to extreme high floods; generally well drained soils
Sparsely vegetated sandbars	exposed areas in the active stream channel characterized by an annual flooding and drying regime

Source: MNHP, 1995

Vegetation on the Straus Barren is typical for shale barrens in the region and, in general, is sparsely vegetated on the steeper slopes and unvegetated where loose shale scree occurs. Upper slopes of the barren are vegetated by a sparse wooded canopy of chestnut oak, Virginia pine (*Pinus virginiana*), white ash, and black gum. The shrub layer becomes prominent at mid slopes and includes blueberry (*Vaccinium* sp.), witch hazel, common serviceberry (*Amelanchier arborea*), and scrub oak (*Quercus ilicifolia*) (MDNHP, 1995).

Vertical ridges occurring on the barren encompass smaller vertical hollows. The hollows, which are slightly less exposed, have a greater accumulation of soil and relatively more vegetation than the rock outcrops. Typical shale barren species occur in the hollows including Pennsylvania sedge (*Carex pensylvanica*), crinkled hairgrass (*Deschampsia flexuosa*), mountain oat grass (*Danthonia compressa*), dittany (*Cunila organoides*), spiderwort (*Tradescantia virginiana*), wild liveforever (*Sedum telephioides*), forked chickweed (*Paronychia fastigiata*), and Venus's looking glass (*Triodanis perfoliata*).

Butterfly pea (*Clitoria mariana*) occurs at the base of the barren adjacent to the railroad grade. The exposed outcrops, which are characterized by scrub oak and red cedar (*Juniperus virginiana*), provide suitable habitat for the northern copperhead (*Agkistrodon contortrix*) (MDNHP, 1995).

Rare plants occur on the Straus Barren scattered across its slopes. Standley's goosefoot (*Chenopodium Standleyi*), a state endangered species, and three flowered melicgrass (*Melica nitens*), a state threatened species, occur in moderate numbers on the barren. Three flowered melicgrass, which prefers a more neutral soil pH, occurs in a small area along the eastern edge of the barren. Two state watchlist species also occur on the site including the shale barren primrose (*Oenothera argillicola*) which occurs in a moderate sized population on the eastern edge of the barren and pussytoes ragwort (*Senecio antennariifolius*) which occurs in large numbers (MDNHP, 1995).

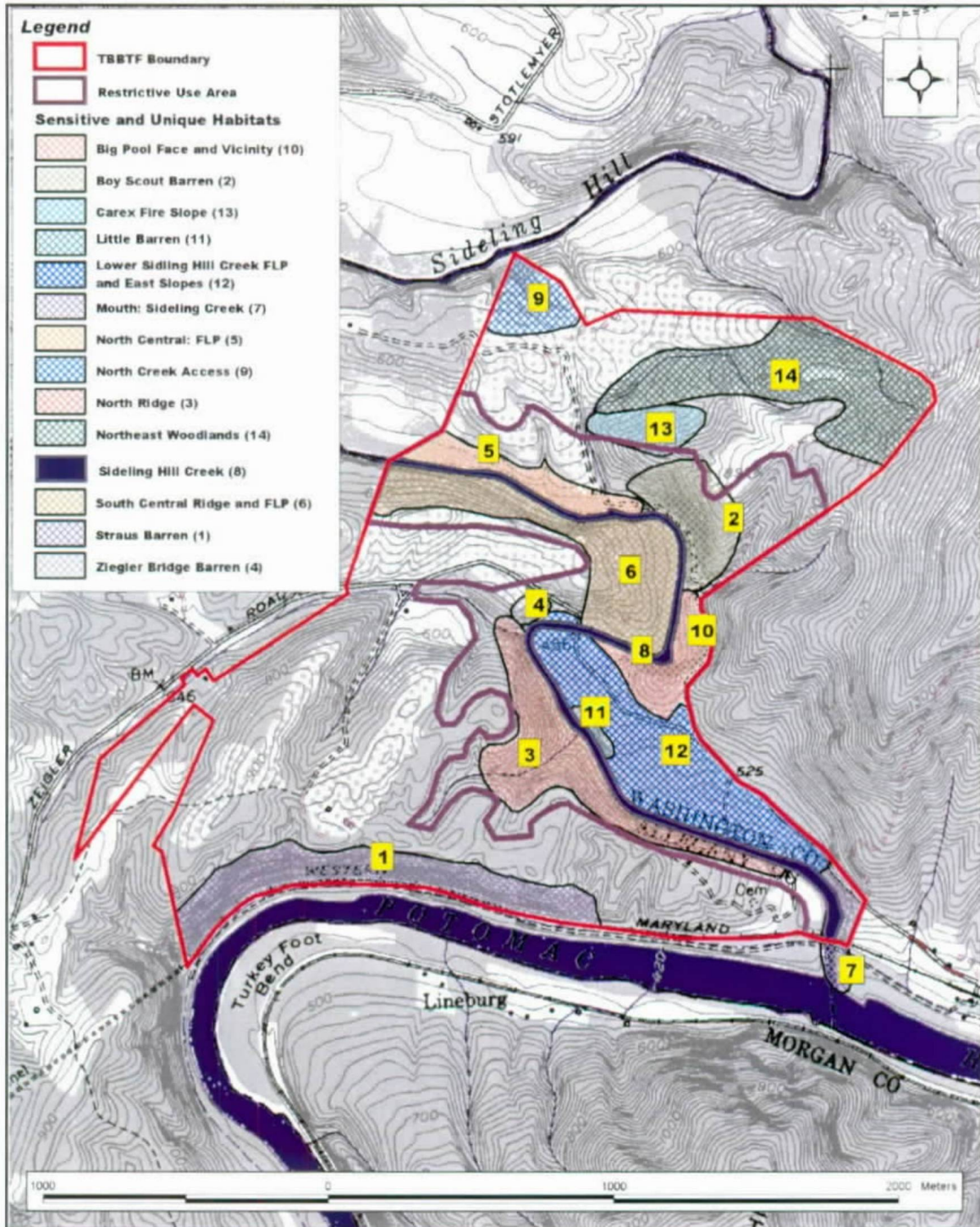
Great mullein (*Verbascum thapsus*) a non-native weed, is invading the Straus Barren and is found scattered throughout the slopes. Microstegium (*Microstegium vimineum*), an invasive non-native grass species, also occurs adjacent to the site in shaded woods surrounding the barren. Conditions on the shale barren probably restrict microstegium from invading the site (MDNHP, 1995).

### 3.13.2 Boy Scout Barren

The Boy Scout Barren is a shale barren located in the east central area of TBBTF adjacent to Sideling Hill Creek (see Figure 3-5). The barren consists of steep shale slopes with the upper most slopes being characterized by exposed shale substrates and some outcrops. The barren faces west/southwest and has a dry mesic to xeric moisture gradient. The barren begins near the base of the hill adjacent to Sideling Hill Creek and extends upslope to an elevation of about 800 feet above sea level (MDNHP, 1995).

Unlike other typical shale barrens, the Boy Scout Barren has a rich and dense herbaceous and shrub layer. Upper slopes of the barren are steep and exposed to the sun and are dominated by Virginia pine. Species richness increases drastically from mid slope to the toe of the barren possibly due to more neutral soil pH and reduced drought stress. As vegetation density increases, white ash, hackberry (*Celtis occidentalis*), and bladdermut become dominants. Red oak and chestnut oak are scattered on the barren primarily around its edges. The Boy Scout Barren has a dense shrub and herbaceous layer dominated by fragrant sumac (*Rhus aromatica*) and deerberry (*Vaccinium stamineum*) with scattered occurrences of dwarf hawthorn. The herbaceous layer is characterized by Pennsylvania sedge, Willdenow's sedge (*Carex willdenowii*), crinkled hairgrass, slender knotweed (*Polygonum tenue*), hairy lip fem (*Cheilanthes lanosa*), blunt nosed woodsia (*Woodsia obtusa*), tinker's weed (*Triosteum perfoliatum*), flowering spurge (*Euphorbia corollata*), hairy bush clover (*Lespedeza hirta*), bottlebrush grass (*Hystrix patuld*), Canada's brome grass (*Bromus pubescens*), Bose's panic grass (*Panicum boscii*), forked chickweed, white flowered leafcup (*Polymnia canadensis*), smooth rockcress (*Arabis laevigata*), wild live forever (*Sedum telephoides*), moss pink (*Phlox subulata*), bluets (*Houstonia sp.*), chickweed (*Stellaria sp.*), and woodland sunflower (*Helianthus*





**Sensitive and Unique Habitats**

**Figure 3-5**

Brigadier General Thomas B. Baker Training Facility, Maryland

Source: USGS Topographic Survey Base Map 1074

^varzcfhto)(MDNHP, 1995). Figure 3-6 is a photograph of young wild live forever and hairy lip fem on the Boy Scout Barren.

Several rare plant species occur on the Boy Scout Barren. Alleghany plum (*Prunus alleghaniensis*), a state threatened species, occurs in small numbers on the barren. Four additional state listed species also occur on the site including the state endangered blunt leaved spurge (*Euphorbia obtusata*), and northern prickly ash (*Zanthoxylum americanum*) and the state threatened three flowered melicgrass and mountain pimpernel (*Taenidia montana*). Figure 3-7 is a photograph of mountain pimpernel on the Boy Scout Barren. Populations of the state listed species are moderately large on the barren. The heart leaved skullcap (*Scutellaria ovata*), a state species of concern, occurs in a small localized population at mid slope on the barren (MDNHP, 1995).

The Olympia marble (*Euchloe olympia*), a state listed butterfly in need of conservation, occurs on the Boy Scout Barren in small numbers. The adult butterflies feed on moss pink, bluets, and chickweed. A rare occurrence of a darkling beetle (*Diaperis nigranotata*) was also recorded on the barren. The site is at the extreme northern limit of the beetle's range (MDNHP, 1995).

Non native weed species occurring on the site include the aggressive barren brome (*Bromus sterilis*) and spotted knapweed (*Centaurea maculosa*). Both species may have become established on the site as a result of past anthropogenic disturbances. Alleghany County Line Road transects the site and the presence of red cedar stumps on the barren indicated that it was cut in the past (MDNHP, 1995). Efforts to control the spread of barren broom and other invasives on the Boy Scout Barren were initiated in early 2000 by DNR and TNC and are expected to continue over a two to four year period.

### 3.13.3 North Ridge

North Ridge extends along Sideling Hill Creek on its west (right) bank downstream from the Ziegler Road crossing and Ziegler Bridge Barren (see Figure 3-5). The area is characterized by steep slopes that extend up from the creek's bank. The slopes face north/northeast and therefore, receive less sunlight during the day. A relatively cool temperature regime and a moist to dry mesic moisture gradient occur on the ridge. Near vertical slopes in shaded cool locations along the creek are very moist and in some places lush vegetation has established. Exposed bedrock along the creek supports various mosses and Christmas fern is common. The dominant trees that occur along the lower slopes are eastern hemlocks with some red oaks. Dense scattered patches of great laurel also occur in the understory (MDNHP, 1995).

The prominence of hemlocks on some of the slopes makes the North Ridge excellent potential habitat for the state threatened blackburnian warbler (*Dendroica fusca*) and the state rare red breasted nuthatch (*Sitta canadensis*). These birds have not been located on the site, but the blackburnian warbler has nested upstream along Sideling Hill Creek in similar habitat (MDNHP, 1995).

A slightly southeast facing vertical slope located at the north end of the site supports a small population of the state threatened Allegheny plum. Climbing fumitory (*Adlumia fungosa*), a state threatened plant species, also occurs on North Ridge on a small ridge about mid slope on the hillside. The plant occurs on loose rocks where leaves have accumulated. The plant grows by twining across the loose exposed rocks (MDNHP, 1995).

#### **3.13.4 Ziegler Bridge Barren**

The Ziegler Bridge Barren is located along the right bank of Sideling Hill Creek just downstream from the Ziegler Road Bridge (see Figure 3-5). The barren extends from Sideling Hill Creek to the top of the adjacent hill. The hillside faces to the southeast and has a mesic to xeric moisture gradient. The barren is dominated by steep slopes consisting of loose shale. Soil accumulates on the less steep slopes particularly at the base of the barren. Vegetation in the area is typical of shale barrens in the region. Red cedar dominates the upper slopes and Virginia pine, chestnut oak and scrub oak are found scattered throughout the barren. The ground cover is dominated by a combination of Pennsylvania sedge and crinkled hairgrass. Herbaceous plants found on the barren include hairy beardtongue, rock twist (*Draba ramosissima*), butterfly weed (*Asclepias tuberosa*), maidenhair spleenwort (*Asplenium trichomanes*), false boneset (*Kuhnia eupatorioides*), forked chickweed, blunt lobed woodsia, hairy lipped fem, long leaved bluet (*Hedyotis longifolia*), and a sedge (*Carex cephalophora*) (MDNHP, 1995).

Pussytoes ragwort, a state watchlist species and mid-Appalachian shale barren endemic, grows in moderate numbers in scattered clumps throughout the barren. Shale barren goldenrod (*Solidago harrisii*), another shale barren endemic plant, also grows in moderate numbers scattered throughout the barren. Both plant species have relatively dense populations compared to other larger shale barrens in the region. The Ziegler Bridge Barren also provides suitable habitat for the northern copperhead (MDNHP, 1995).

#### **3.13.5 North Central Floodplain**

The North Central Floodplain is located on the left bank of Sideling Hill Creek from the western boundary of TBBTF downstream to where the creek meanders to the south (see Figure 3-5). The site is characterized by a generally flat floodplain bounded by gentle slopes that extend upward from the floodplain. The banks extending up from the floodplain face to the south, which exposes them to longer periods of sunlight. As a result of the bank's aspect, the soils in the area have a moist to dry mesic gradient. The upland forest above the floodplain is characterized primarily by oaks including chestnut oak, red oak, white oak, and some mockemut hickory (MDNHP, 1995).

Vegetation is more diverse on the primary floodplain and is characterized by white ash, sycamore, tulip poplar, black cherry, black maple (*Acer nigrum*), river birch, and several oaks. Sapling and shrub vegetation in the floodplain is characterized by spicebush, paw paw, muscledwood, witch hazel, and redbud. Woody understory vegetation includes





**Figure 3-6. Young wild live forever and hairy lip fern on the Boy Seoul Barren**



**Figure 3-7. Mountain pimpernel on the Boy Seout Barren**

poison ivy, St. John's Wort (*Hypericum* sp.), button bush (*Cephalanthus occidentalis*), spreading dogbane (*Apocynum adrosaemifolium*) and common greenbrier (*Smilax rotundifolia*). Common herbaceous species found in the floodplain include wing stem, deertongue, Virginia wild rye, Virginia creeper, jewelweed, Christmas fern, tall meadow rue (*Thalictrum polygamum*), golden ragwort (*Senecio aeries*), wreath goldenrod (*Solidago caesia*), boneset (*Eupatorium perfoliatum*), and May apple (MDNHP, 1995).

Sweet-scented Indian plantain (*Synosma suaveolens*), a state endangered plant occurs on the North Central Floodplain. Small patches of small-headed sunflower (*Helianthus microcephalus*), a state endangered plant species, also occurs on the floodplain at various locations near the streambank. The small-headed sunflower is a component of the late summer grassland community that occurs along the narrow dry stretches of the shoreline and on some exposed sandbars. Common grasses occurring in the community include Indian grass (*Sorghastrum nutans*) and big bluestem (*Andropogon gerardii*). Less common plant species occurring in the floodplain and sandbar communities include purpletop (*Tridens flavus*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), woodland dropseed (*Muhlenburgia sylvatica*), common woodreed (*Cinna arundinacea*), wand lespedeza (*Lespedeza intermedia*), ridgestem yellow flax (*Linum striatum*), sunflower (*Solidago canadensis* var. *hargerii*), everlasting sunflower (*Heliopsis helianthoides*) tall flat-topped white aster (*Aster umbellatus*), dogbane (*Apocynum* sp.), American germander (*Teucrium canadense*), fireweed (*Erechtites hieracifolia*), rhombic copperleaf (*Acalypha rhomboidea*), small-leaved white snakeroot (*Eupatorium aromaticum*), hollow stemmed joe-pye weed (*Eupatorium fistulosum*), northern crabgrass (*Digitaria sanguinalis*), and moneywort (*Lysimachia nummularia*) (MDNHP, 1995).

Non-native invasive plant species occurring on the floodplain include garlic mustard (*Alliaria petiolata*), microstegium and Morrow's honeysuckle (*Lonicera morrowii*). Arthraxon (*Arthraxon hispidus*), an invasive non-native grass, is also present on the floodplain. The most threatening invasive on the North Central Floodplain is microstegium, which is currently displacing native vegetation on the floodplain (see Section 5.13.1.2 for a discussion of invasive plant species management on the North Central Floodplain).

### 3.13.6 South Central Ridge and Floodplain

The South Central Ridge and Floodplain is located on the south (right) bank of Sideling Hill Creek across from the North Central Floodplain (see Figure 3-5). The site is characterized by very steep slopes and a somewhat flat, east facing floodplain. Soils on the steep slopes have a mesic to dry mesic gradient.

Vegetation on the forested floodplain is characterized by red oak, white ash, sycamore, black cherry, tulip poplar, and river birch. The understory is dense and is characterized by spicebush, musclewood, witch hazel, and redbud. Herbaceous species on the floodplain include wing stem, deertongue, Virginia wild rye, Virginia creeper, jewelweed, May apple, Christmas fern, and boneset. Common greenbrier also occurs on the floodplain. The lower slopes in the riparian area are characterized by a combination

of wet exposed rock faces and a steep eastern hemlock forest with an understory of great laurel and various herbs such as jewelweed and maidenhair fern. Upper slopes are drier and characterized by hemlock which grades into an oak forest on the ridge top.

Crested iris, a state endangered plant, occurs in large numbers on the narrow floodplain terrace in clumps on moist rock faces under the hemlock forest canopy. Wood's sedge (*Carex tetanica* var. *woodii*), a state endangered species, is present along the edges of the fire road located on the site. Several state watchlist plant species also occur on the south central ridge and floodplain including: green dragon (*Arisaema dracontium*) and corymbed spiraea (*Spiraea betulifolia* var. *corymbosa*) which occur on the upper edge of the floodplain; White Bear Lake sedge (*Carex albursina*), which occasionally occurs on the floodplain and lower hemlock slopes; three leaved rosinweed (*Silphium trifoliatum*), which occurs as scattered individuals on the floodplain; and lance-leaved loosestrife, which occurs in several patches on the dry, upper south facing wooded slope. The state endangered tiger beetle (*Cicindela ancocisconensis*) has also been documented on the floodplain through the area (MDNHP, 1995).

Hemlock forests in the South Central Ridge and Floodplain provide good potential habitat for the blackburnian warbler, a state threatened bird species, and the red-breasted nuthatch, a state rare bird species (MDNHP, 1995).

Microstegium, a non-native invasive grass, is displacing native vegetation on the floodplain. The grass has become very prominent in some places on the floodplain. Woolly hemlock adelgid (*Adelgis tsugae*), an insect introduced from Eurasia, has also become locally abundant in the area. Several years of infestation by the insect can completely kill a grove of hemlock (MDNHP, 1995).

### **3.13.7 Mouth of Sideling Hill Creek - Floodplain/Barren**

The floodplain/barren is located at the mouth of Sideling Hill Creek at its confluence with the Potomac River. The floodplain/barren extends off of TBBTF and into the C&O Canal National Historical Park (see Figure 3-5). The floodplain of the Potomac River in this area has moist to dry mesic soils with a mature, well-developed canopy of boxelder, sycamore, and silver maple. Typical floodplain shrubs and herbaceous species occurring in this area include poison ivy, spicebush, jewelweed, Virginia creeper, and Virginia wild rye. Riverbank sandbars occur at the mouth of Sideling Hill Creek and along the Potomac River. The sandbars are characterized by open sandy soils that are exposed to frequent disturbance from flooding. The unstable character of the sandbars limits the types of vegetation that can persist on them. Plant species found on the sandbars include tree seedlings of sycamore and river birch along with various grasses and sedges. Dense stands of water willow persist at the water's edge (MDNHP, 1995). The steepest slopes on the site are characterized by a small, south facing, shale barren with a thin dry soil mantle. The shale barren supports a woodland characterized by a partial canopy of chestnut oak and red oak (MDNHP, 1995).

Two state listed plant species occur on the shale barren at the mouth of Sideling Hill Creek. Low bindweed (*Calystegia spithamea*) and mountain pimpernel (*Taenidia*



*montana*) occur in moderate numbers on the wooded shale barren. Two state watchlist plant species also occur on the site including pussytoes ragwort, which is found on the shale barren, and green dragon, which occurs in moderate numbers on the forested floodplain (MDNHP, 1995).

Microstegium, a non-native invasive grass, is threatening community diversity on the floodplain and sandbars by displacing native vegetation (MDNHP, 1995).

### 3.13.8 Sideling Hill Creek

Sideling Hill Creek, which flows for approximately two miles across TBBTF, drains a basin area of approximately 66,682 acres. The creek has a gentle slope and, under normal conditions, a smooth flow. The stream varies from approximately 15 feet in width and a few inches in depth in riffles to 50 feet in width and over six feet in depth in the deeper pools. Streamflow varies daily and seasonally. In spring, high flows from precipitation and runoff from snowmelt result in fast moving currents and the presence of deep pools. In the summer months, shallow reaches of the creek nearly dry up, but the deeper pools persist. Flows also vary drastically between periods of drought and heavy rainfall (MDNHP, 1995).

The substrate along the creek varies from rock bottom to pebbles and cobbles to sand and clay. The variable substrate provides good habitat for a variety of aquatic species. Several species of mussels including the common eastern spike (*Elliptio complanata*) and pocketbook mussel occur in the creek.

A mussel survey conducted on Sideling Hill Creek in 1989 identified nine species of mussels including the state endangered brook floater (*Alasmidonta varicosa*), green floater, yellow lampmussel (*Lampsilis cariosa*), and triangle floater. The green floater is also a Federal species of concern. In 1994, the Maryland Natural Heritage and Wildlife Diversity Program conducted a survey of mussel species occurring in Sideling Hill Creek and the Potomac River between Allegany and Montgomery Counties. A thorough survey of mussel species occurring in Sideling Hill Creek on TBBTF was conducted as part of the larger survey. The survey identified 5 species of mussels on TBBTF. Only two of the mussel species identified on the facility during the survey were represented by live animals. Mussel species identified on TBBTF during the survey included the interior squawfoot, eastern spike, green floater, Atlantic spike, and the pocketbook mussel. The green floater, Atlantic spike, and pocketbook mussel were represented only by spent shells (Boyle and MacIvor, 1995).

The introduced Asian clam was also identified during the mussel survey on TBBTF. The Asian clam displays life-history traits that are well adapted for life in unstable, unpredictable habitats and, as a result, has become the most invasive of all North American freshwater bivalve species. The Asian clam is now the most predominant mussel species occurring in Maryland. The clam could become a direct threat to native mussels occurring in Sideling Hill Creek due to its prolific nature and ability to compete directly with native clams.

Common fish occurring in Sideling Hill Creek include smallmouth bass, several species of bluegill, rainbow trout, common shiner, fallfish, rock bass, and rainbow darter (see Section 3.14.4 for a more complete listing of fish occurring in Sideling Hill Creek on, and adjacent to, TBBTF). Trout occurring in Sideling Hill Creek are not native and are stocked at locations upstream of TBBTF. Rainbow trout are stocked in the creek by the DNR Freshwater Fisheries Division (see Section 4.4.3 and 5.8 for additional information on recreational fishing and fisheries management.) (DNR, 1993).

Wood turtles are known to use the creek for mating and hibernation and the northern water snake is common in the water willow beds along the creek. Figure 3-8 is a photograph of a wood turtle on the Lower Sideling Hill Creek Floodplain. In addition, numerous birds depend on aquatic life in the creek for food. Belted kingfishers (*Ceryle alcyon*), green herons (*Butorides virescens*), and great blue herons (*Ardea herodias*) commonly occur along the creek.

Sideling Hill Creek supports a diverse population of aquatic and emergent plants associated with its riverine wetlands. Figure 3-9 is a photograph of golden club growing in Sideling Hill Creek. Section 3.9 (Wetlands) provides a list of riverine wetland vegetation identified along Sideling Hill Creek on TBBTF.

Sideling Hill Creek also supports one of the largest remaining populations of the federally endangered plant species harperella. The plant occurs throughout the reaches of Sideling Hill Creek on TBBTF and occurs in large numbers among water willow beds. The plant also occurs on gravel bars and sholes in the creek bed. Population density in the area can be largely attributed to high water quality (low silt loads) uninhibited stream flow and variations in stream volume during the year (see Section 3.16 for additional information on harperella.).

Microstegium occurs at several locations along Sideling Hill Creek, and poses a threat to native plant species including the federally endangered harperella. Arthraxon, an invasive wetland grass species, also occurs in lesser numbers along the creek.

### **3.13.9 North Creek Access**

The North Creek Access, which is located in the north central corner of TBBTF (see Figure 3-5), is characterized by a wooded north facing mesic hillside, a small section of floodplain and Sideling Hill Creek. The forest canopy on the hillside at the North Creek Access site consists predominantly of red maple, hemlock, sugar maple (*Acer saccharum*), tulip poplar, sassafras (*Sassafras albidum*), white pine (*Pinus strobus*), and shagbark hickory (*Carya ovata*). The understory is characterized by red bud, blackhaw viburnum (*Viburnum prunifolium*), flowering dogwood (*Cornus florida*), and serviceberry. Herbaceous vegetation on the hillslope includes Bose's panic grass, Swan's sedge (*Carex swanii*), finger sedge (*Carex digitalis*), White Bear Lake sedge, head bearing sedge (*Carex cephalophora*), whorled loosestrife (*Lysimachia quadrifolia*), linear leaved panic grass (*Panicum linearifolium*), and Christmas fern (MDNHP, 1995).



Woody vegetation occurring in the floodplain includes sycamore, black walnut (*Juglans nigra*), butternut (*Juglans cinerea*), white ash, slippery elm (*Ulmus rubra*), musclewood, blackgum, spicebush, great laurel, elderberry (*Sambucus canadensis*), and poison ivy. Herbaceous vegetation found on the floodplain include deer tongue, upright wood sorrel (*Oxalis stricta*), very slender sedge, fringed loosestrife, green headed cone flower (*Rudbeckia laciniata*), May apple, enchanter's nightshade (*Circaea lutetianna* var. *canadensis*), and sweet woodruff (*Asperula odorata*) (MDNHP, 1995).

Butternut, a state rare species, occurred on the floodplain at the time of the inventory (1993-1994). Two small trees occurred on the floodplain, both infested with canker dieback (*Melanconis juglandis*). The disease affects butternuts throughout their range and is the main reason why the tree is declining in numbers.

Aggressive non-native plant species occurring on the North Creek Access area include multiflora rose (*Rosa multiflora*) and microstegium.

### 3.13.10 Big Pool Face and Vicinity

The Big Pool Face and Vicinity extends from the Ziegler Road bridge upstream for approximately 2,000 feet on the left bank of Sideling Hill Creek (see Figure 3-5). The Big Pool Face is named for the north-facing escarpment that overlooks a significantly deep pool on Sideling Hill Creek. The near vertical escarpment is greater than 200 feet in height. The escarpment is characterized by barren rock faces, some covered with moss. A variety of small trees grow in the crevices including chestnut oak, white basswood, and white ash. Shrubs occurring on the escarpment include American hydrangia, ninebark, native bush honeysuckle, Appalachian gooseberry, flowering raspberry, downy arrowwood, and choke cherry (MDNHP, 1995).

The herbaceous plants growing on the rock faces vary by season. Early summer plants on the rock faces include moss pink, lyre-leaved rockcress (*Arabis lyrata*), Willdenow's sedge, very-slender sedge, ambiguous sedge (*Carex amphibola*), broad-leaved sedge (*Carex platyphylla*), nodding sedge (*Festuca obtusa*), long-leaved bluet, bluegrass (*Poa autumnalis*), rusty woodsia (*Woodsia ilvensis*), prairie wedgegrass (*Sphenopholis obtusata*), and *Carex albicans* (MDNHP, 1995).

Mid- to late-summer herbaceous vegetation on the rock faces includes thimbleweed (*Anemone virginiana*), shepard cress (*Teesdalia nudicaulis*), maidenhair spleenwort, harebell (*Campanula rotundifolia*), common sundrops (*Oenothera tetragona*), hairgrass (*Deschampsia flexulosa*), panic grass (*Panicum lanuginosum*), meadow spikemoss (*Selaginella apoda*), Culver's root (*Veronicastrum virginicum*), Carolina tassel-rue (*Trautvettaria carolinensis*), green-headed coneflower, wild live-forever, white wood aster (*Aster divaricatus*), woodland muhly (*Muhlenbergia sylvatica*), and broad-leaved goldenrod (*Solidago flexicaulis*) (MDNHP, 1995).

Steep north-facing slopes support a forest canopy and subcanopy of eastern hemlock, chestnut oak, white oak, blackgum, serviceberry, great laurel, witch hazel, and sugar



**Figure 3-8. A wood turtle on the Lower Sideling Hill Creek Floodplain**



**Figure 3-9. Golden club growing in Sideling Hill Creek**

maple. Herbaceous plants on the north facing slopes are sparse but include bluetts (*Houstonia caerulea*), Christmas fens, whorled loosestrife, wreath goldenrod, Virginia polypod (*Polypodium virginianum*), and partridgeberry (*Mitchella repens*). The forests on the knoll above the rock outcrop are characterized by mockemut hickory, black birch (*Betula lenta*), white pine, flowering dogwood, trailing arbutus (*Epigaea repens*), squaw weed (*Senecio obovatus*) and bastard toadflax (*Comandra umbellata*). In the late summer, the roadside along Allegany County Line Road is characterized by basal bee balm (*Monarda clinopodia*), smooth tick trefoil (*Desmodium glabellum*), naked flower tick trefoil (*Desmodium nudiflorum*), prostrate tick trefoil (*Desmodium rotundifolium*), hairy bush clover, intermediate tick trefoil (*Lespedeza intermedia*), slender bush clover (*Lespedeza virginica*), blue eyed grass (*Sisyrinchium montanum*), and wild yellow flax (*Linum virginianum*) (MDISHP, 1995).

Rusty woodsia (*Woodsia ilvensis*), a state threatened fern species, occurs in crevices on the lower western half of the north-facing outcrop. It probably also occurs in less accessible areas of the outcrop. Harebell, a state rare plant species, also occurs on the rock face. Several state watchlist plant species occur on the rock faces at this site including Carolina tassel-rue, woodland dropseed and white basswood. Basal bee balm and pointed leaved tick trefoil (*Desmodium glutinosum*) occur on the roadside along Allegany County Line Road (MDNHP, 1995).

### 3.13.11 Little Barren

The Little Barren is located on the left bank of Sideling Hill Creek approximately 2,000 feet downstream from the Ziegler Road Bridge (see Figure 3-5). The barren is characterized by a steep rock outcrop. Woody vegetation occurring on the outcrop includes red maple, bear oak (*Quercus ilicifolia*), chestnut oak, red oak, pignut hickory, bittemut hickory (*Carya cordiformis*), white pine, Virginia pine, serviceberry, ironwood, black locust, deerberry, black huckleberry (*Gaylussacia baccata*), Pinxter flower (*Rhododendron periclymenoides*), and Virginia creeper. Black walnut and shagbark hickory grow on the barren at the stream's edge. Herbaceous plant species occurring on the barren include early saxifrage (*Saxifraga virginiana*), bird's foot violet (*Viola pedata*), moss pink, old field cinquefoil (*Potentilla simplex*), dittany, wreath goldenrod, Harris's goldenrod (*Solidago harrisii*), mountain Indian-physic (*Porteranthus trifolius*), shale barren smooth rock cress (*Arabis laevigata* var. *burkii*), ebony spleenwort (*Asplenium patyneurum*), hairy lip-fern, hairgrass, marginal shield fern (*Dryopteris marginalis*), and long-leaved bluets (MDNHP, 1995).

### 3.13.12 Lower Sideling Hill Creek Floodplain and East Slopes

This site extends downstream from Ziegler Road Bridge, primarily on the left bank of Sideling Hill Creek (see Figure 3-5). The site includes the narrow floodplain of Sideling Hill Creek, an occasionally flooded creek terrace, and a relatively level to rolling upland dry forested slope. The site also includes a small area of floodplain just below the Ziegler Road Bridge on the west (right) creek bank.

Historically, the downstream section of the floodplain was cleared and fenced for pasture. Trees in this section of the floodplain consist primarily of early successional species including black cherry, river birch, white ash, sycamore, red maple, box elder (*Acer negundo*), tulip poplar, and black locust. The side slopes are characterized by elms, pignut hickory, red oak, and bladdemut. Vernal pools occur in the abandoned wet pasture (see Section 3.9.1 for additional discussion of vernal pools) (MDNHP, 1995).

Upstream of the abandoned pasture area the floodplain is characterized by a variety of herbaceous species, some of which include plantain leaved pussytoes, shale barren pussytoes, rattlesnake fem, crested iris, rough bedstraw, interrupted fem, ambiguous sedge, charming sedge (*Carex blanda*), colony sedge (*Carex communis*), rather slender sedge (*Carex gracilescens*), very slender sedge, Wood's sedge, Pennsylvania sedge, and broad-leaved sedge. Herbaceous plants occurring on the wooded terraces above the floodplain include species typical of mesic to xeric woodlands including four leaved milkweed, lady fem, dwarf hawthorn, wild comfrey, wild licorice, ambiguous sedge, closely covered sedge (*Carex albicans*), White Bear Lake sedge, finger sedge, loose culmed sedge (*Carex laxiculmus*), and Wildenow's sedge. Additional species that can be found along the woods edge include white milkweed (*Asclepias variegata*), hairy skullcap (*Scutellaria elliptica*), smooth rockcress, and bent backward sedge (*Carex retroflecta*) (MDNHP, 1995).

A cleared power line right of way parallels Pearre Road on its down slope side. The right of way alternately crosses dry sandy ridges and lower damp drainages. Vegetation found established on the dry sandy knolls include slender false foxglove (*Agalinis tenuifolia*), wild yellow flax, Ioin's-foot (*Prenanthes serpanteria*), shaved sedge (*Carex tonsa*), charming sedge, stellate sedge (*Carex radiata*), meadow-geranium (*Geranium pratense*), dwarf hawthorn, dittany, hairgrass, Willdenow's sedge, narrow-leaved mountain mint (*Pycnanthemum tenuifolium*), hispid buttercup (*Ranunculus hispidus*), prairie wedgegrass, and wood vetch (*Vicia caroliniana*) (MDNHP, 1995).

Two state listed plant species occur on the dry road banks of Pearre Road including hispid goldenrod (*Solidago hispida*), a state endangered species, and racemed milkwort (*Polygala polygama*) a state threatened species. Other vegetation along the roadside includes slightly hirsute sedge (*Carex hirsutella*), meadow geranium, woodland sunflower, whorled milkwort (*Polygala verticillata*), hairy bush clover, intermediate bush clover (*Lespedeza intermedia*), and stiff yellow flax (*Linum medium*) (MDNHP, 1995).

Broad glumed brome (*Bromus latiglumis*), and small-headed sunflower, both state endangered plant species, occur on the west floodplain in the immediate vicinity of Ziegler Road Bridge. Crested iris, a state endangered species, occurs on the floodplain terrace just upstream of the Little Barren along with Wood's sedge, another state endangered species. Grove meadow grass (*Poa alsodes*), a state endangered plant, also occurs at several locations on the floodplain (MDNHP, 1995).

The floodplain habitats at this site favor use by many wildlife species including wild turkey (*Meleagris gallopavo*), wood turtles, and box turtles (*Terrapene caroliniana*



*caroliniana*) (MDNHP, 1995). Figure 3-8 is a photograph of a wood turtle on the Lower Sideling Hill Creek Floodplain.

Several exotic invasive plant species were identified on the floodplain during a site reconnaissance conducted for wetlands in May of 2000. Multiflora rose occurs in a dense, impassable stand along the firebreak and clearing for the phone line to the Tabler Lodge. Multiflora rose also occurs as thick stands of young plants spreading out from the fire break into the adjacent floodplain areas. Microstegium occurs throughout the floodplain in sparse to dense populations. Microstegium is more prevalent on the southern half of the floodplain and on the existing access road to the stream crossing (closed ford). Microstegium is less prevalent in the northern section of the floodplain, but occurs along the existing dirt road/trail that runs north/south across the floodplain. Garlic mustard also occurs across the floodplain, but has not yet become established as a dense population (see Section 5.13.1.2 for a discussion of invasive plant species management on the Lower Sideling Hill Creek and East Slopes).

### 3.13.13 Carex Fire Slope

The Carex Fire Slope is located on a north facing slope just to the north of the Boy Scout Barren (see Figure 3-5). The site was burned in 1993 as the result of a house fire that spread to the woods and killed many of the trees on the hillside. Trees present from the old forest include white oak, pignut hickory, shagbark hickory, mockemut hickory, chestnut oak, and red oak. Woody vegetation in the understory includes flowering dogwood, serviceberry, blackgum, witch hazel, and scattered patches of black huckleberry, particularly toward the top of the hill (MDNHP, 1995).

Following the fire a relatively dense cover of herbaceous vegetation consisting of grasses, sedges, and forbs became established. Sedges present on the hill slope include Wildenow's sedge, White Bear Lake sedge, ambiguous sedge, head-bearing sedge, finger sedge, slightly hirsute sedge, Pennsylvania sedge, umbel-bearing sedge (*Carex umbellata*), Muhlenberg's sedge (*Carex muhlenbergii*), foxtail sedge (*Carex vulpinoidea*), and stellate sedge. Grass species occurring on the slope include mostly perennial species characteristic of woodlands and woodland edges including Bose's panic grass, variable panic grass (*Panicum commutatum*), bushy panic grass (*Panicum dichotomum*), low panic grass (*Panicum linearifolium*), nodding fescue (*Festuca obtusa*), Canada bluegrass, prairie wedgegrass, upland bent grass (*Agrostis perennans*), poverty grass (*Danthonia spicata*), and one non-native annual grass, barren brome (MDNHP, 1995).

Other herbaceous plant species occurring on the Carex Fire Slope include intermediate wood fern (*Dryopteris intermedia*'), ebony spleenwort, downy false-foxglove (*Aureolaria virginica*), hay-scented fern (*Dennstaedtia punctilobula*), widow's tears (*Tradescantia virginiana*), small-flower phacelia (*Phacelia dubia*), early saxifrage, erect goldenrod (*Solidago erecta*), and tall agrimony (*Agrimonia gryposepala*) (MDNHP, 1995).

The stellate sedge, a state endangered plant species occurs on the Carex Fire slope. White Bear Lake sedge, a state watchlist species also occurs on the site (MDNHP, 1995).

The main reason the site is considered a sensitive area is because of its potential value as a study site for the effects of fire on plant community composition in the dry woodlands of the region. Disturbance by fire was common in the area during the late 1800s and probably influenced the present plant community composition in the region (MDNHP, 1995).

### 3.13.14 Northeast Woodlands

The Northeast Woodlands site is located on the mid-slopes of Sideling Hill in the northeast corner of TBBTF (see Figure 3-5). Topography in the area is level to steep and shallow rock outcrops occur along some of the narrow ridges that separate stream drainages. Soils in the area range from shallow on the steep side slopes to deep at the base of slopes and in some of the hollows (MDNHP, 1995).

Trees found in the Northeast woodlands include chestnut oak, red pignut hickory, red oak, sugar maple, white pine, and witch hazel, with occasional American chestnut (*Castanea dentata*) and table mountain pine (*Pinus pungens*). Shrubs found in the wooded areas include deerberry, black raspberry (*Rubus occidentalis*), and maple-leaved viburnum (*Viburnum acerifolium*). On hillside swales where deeper soils occur, woody vegetation such as tulip poplar, hop-hornbeam (*Ostrya virginiana*), white ash, cucumbertree (*Magnolia acuminata*), black walnut, slippery elm, red bud, and spicebush are present. Herbaceous plant species found in the woodland area are not as diverse as in other areas of TBBTF, but species such as perfoliate bellwort (*Uvularia perfoliata*), and greenish sedge (*Carex virescens*) are only found in this area (MDNHP, 1995).

Some of the broader ridges in the area appear to have been cleared for pasture in the past, but have been abandoned for many years. Past disturbance is evidenced by the presence of Virginia pine, red maple, and sassafras. Remnants of an orchard and associated weedy herbaceous species occur on the knoll to the northeast of the Boy Scout Barren (MDNHP, 1995).

Corymbed spiraea, a state watchlist plant species, occasionally occurs in the Northeast Woodlands area in association with wooded rocky areas (MDNHP, 1995).

Non native invasive species occurring in the Northeast Woodlands include microstegium and garlic mustard. The invasive plant species occur at a few locations along the existing forest road (MDNHP, 1995).

## 3.14 FAUNA

Surveys for freshwater mussels were conducted in Sideling Hill Creek in 1989 and 1994 and are discussed under invertebrates below. In addition, the DNR Wildlife and Heritage Division (DNR WHD) comprised a list of vertebrate species occurring in the Sideling Hill Wildlife Management Area which encompasses the area surrounding TBBTF. Surveys of fish species occurring in Sideling Hill Creek just upstream of TBBTF in Green Ridge State Forest were also conducted by DNR as part of the development of the

Green Ridge State Forest Ten Year Resource Management Plan. Since habitats on TBBTF are similar to those on the adjacent surveyed management areas and access to TBBTF is not restricted by fencing or other obstructions, the results of those surveys were used to characterize fauna likely to be found on the facility. Wildlife species identified in the surveys are listed below.

### 3.14.1 Mammals

Upland mammals found in abundant numbers in the forests around TBBTF include white-tailed deer (*Odocoileus virginianus*), fox squirrel (*Sciurus niger*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), and eastern cottontail rabbit (*Sylvilagus floridanus*). Other mammals found in the area include muskrat (*Ondatra zibethica*), beaver (*Castor canadensis*), mink (*Mustela vison*), chipmunk (*Tamias striatus*), mice, southern flying squirrel (*Glaucomys volans*), long-tailed weasel (*Mustela frenata*), skunk, Virginia opossum (*Didelphis virginiana*), bobcat (*Lynx rufus*) and black bear (*Ursus americanus*). Thirty-seven species of mammals were recorded as occurring in the Sideling Hill Wildlife Management Area adjacent to TBBTF. Large mammals recorded as occurring in the area include white-tailed deer, bobcat, black bear, eastern gray fox (*Urocyon cinereoargenteus*), red fox, and coyote (*Canis latrans*). Small mammals recorded in the area include the big brown bat (*Eptesicus fuscus*), silver-haired myotis (*Lasionycteris noctivagans*), Keen's myotis (*Myotis keenii*), little brown myotis (*Myotis lucifugus*), red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), Virginia opossum, masked shrew (*Sorex cinereus*), short-tailed shrew (*Blarina brevicauda*), least shrew (*Cryptotis parva*), hairy-tailed mole (*Parascalops breweri*), star-nosed mole (*Condylura cristata*), eastern cottontail rabbit, eastern chipmunk, woodchuck (*Marmota monax*), gray squirrel, fox squirrel, red squirrel (*Tamiasciurus hudsonicus*), southern flying squirrel, white-footed mouse (*Peromyscus leucopus*), eastern woodrat (*Neotoma floridana*), Gapper's red-backed mouse (*Clethrionomys gapperi*), muskrat, meadow jumping mouse (*Zapus Hudsonius*), raccoon, long-tailed weasel, mink, eastern spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), river otter (*Lutra canadensis*), and beaver (DNR WHD, 1995). Figure 3-10 is a photograph showing signs of recent beaver activity on a tulip poplar on the floodplain of Sideling Hill Creek on TBBTF.

### 3.14.2 Birds

A wide variety of neotropical migrants and songbirds occur in the forests around TBBTF. The rich diversity of habitats on TBBTF provides ecosystem conditions suitable for many bird species. In addition, numerous snags and dead trees provide nesting and foraging opportunities helping to enhance the biodiversity of bird species occurring on the facility. Figure 3-11 is a photograph of a nest cavity in a snag on TBBTF. Wild turkey and ruffed grouse are popular game birds in the area and other common birds include pileated woodpecker, red-tailed hawk, and the barred owl. One hundred thirty-eight species of birds were identified by the DNR WHD in the area around TBBTF. A partial listing of the bird species occurring in the area is included below. A complete listing of the birds identified in the Sideling Hill Wildlife Management Area is included in Appendix B. A



partial list of songbirds occurring on TBBTF includes tufted titmouse (*Parus bicolor*), red-breasted nuthatch, white-breasted nuthatch (*Sitta carolinensis*), Carolina wren (*Thryothorus ludovicianus*), house wren (*Troglodytes aedon*), ruby-crowned kinglet (*Regulus calendula*), eastern bluebird (*Sialia sialis*), wood thrush (*Hylocichla mustelina*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), cedar waxwing (*Bombycilla cedrorum*), yellow-throated warbler (*Denroica dominica*), scarlet tanager (*Piranga olivacea*), northern cardinal (*Cardinalis cardinalis*), downy woodpecker (*Picoides bubsecens*), red-bellied woodpecker (*Melanerpes carolinus*) and indigo bunting (*Passerina cyanea*). A partial list of raptors occurring in the area of TBBTF includes sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), eastern screech owl (*Otis asio*), great homed owl (*Bubo virginianus*), barred owl (*Strix varia*), common night hawk (*Chordeiles minor*), and turkey vulture (*Cathartes aura*). A partial list of marsh and water birds occurring in the vicinity of TBBTF includes the green-backed heron, wood duck (*Aix sponsa*), green-winged teal (*Anas crecca*), American black duck (*Anas rubripes*), and mallard (*Anas platyrhynchos*) (DNR WHD, 1995).

### 3.14.3 Reptiles and Amphibians

Forty-three species of reptiles and amphibians were identified in the Sideling Hill Wildlife Management Area adjacent to TBBTF. Twelve species of newts and salamanders were identified including the red-spotted newt (*Notophthalmus viridescens viridescens*), spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*), northern dusky salamander (*Desmognathus fuscus*), two lined salamander (*Eurycea wilderae*), longtail salamander (*Eurycea longicauda longicauda*), four-toed salamander (*Hemidactylum scutatum*), redback salamander (*Plethodon cinereus*), valley and ridge salamander (*Plethodon hoffmani*), and the northern red salamander (*Pseudotriton ruber ruber*). In addition, an uncommon salamander (state watch-list species) known as the Jefferson salamander (*Ambystoma jeffersonianum*) has been documented on the nearby C&O Canal Property. This salamander could be found in association with temporary pools that occur on TBBTF. Toads and frogs identified in the vicinity of TBBTF include the American toad (*Bufo americanus*), Fowler's toad (*Bufo woodhousei fowleri*), northern spring peeper (*Hyla crucifer*), gray treefrog (*Hyla versicolor*), upland chorus frog (*Pseudacris triseriata*), bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), and wood frog (*Rana sylvatica*). Turtles identified on, and in the vicinity of TBBTF include common snapping turtle (*Chelydra serpentina*), eastern painted turtle (*Chrysemys picta*), wood turtle, and the eastern box turtle. Snakes identified on, and in the vicinity of TBBTF include the eastern worm snake (*Carphophis amoenus*), northern black racer (*Coluber constrictor*), southern ringneck snake (*Diadophis punctatus*), black rat snake (*Elaphe obsoleta*), milk snake (*Lampropeltis triangulum*), eastern hognose snake (*Heterodon platyrhinos*), northern water snake, eastern smooth green snake (*Opheodrys vernalis*), northern brown snake (*Storeria dekayi*), northern redbelly snake (*Storeria occipitomaculata*), eastern garter snake (*Thamnophis sirtalis*), copperhead, and timber rattlesnake (*Crotalus horridus*). Two species of lizards have also been identified on, and in the vicinity of

TBBTF including the northern fence lizard (*Sceloporus undulatus hyacinthinus*) and the five-lined skink (*JEumeces fasciatus*) (DNR WHD, 1995). Figure 3-12 provides photographs of northern fence lizards on a building on TBBTF.

#### 3.14.4 Fish

A survey of fish species occurring in Sideling Hill Creek within the boundaries of TBBTF has not been conducted. Maryland Department of Natural Resources Fisheries Division surveys have been conducted upstream of TBBTF on Sideling Hill Creek in the Green Ridge State Forest. Additional fish surveys were conducted in 1996 and 1997 by Frostberg State University further upstream in the vicinity, and downstream of, the Interstate 68 crossing of Sideling Hill Creek (Raesly, 1997). Fish identified by DNR in Sideling Hill Creek upstream of TBBTF include: common shiner, spottail shiner, roseface shiner, comely shiner, creek chub, fallfish, white sucker, margined madtom, rock bass, smallmouth bass, redbreast sunfish, green sunfish, longear sunfish, stoneroller, bluntnose minnow, longnose dace, creek chubsucker, greenside darter, rainbow darter, fantail darter, mottled sculpin and rainbow trout (DNR, 1993). Trout occurring in Sideling Hill Creek are not native and are stocked at locations upstream of TBBTF. Fish species occurring in the water supply pond include largemouth bass and several species of bluegills.

#### 3.14.5 Invertebrates

A mussel survey conducted on Sideling Hill Creek in 1989 identified nine species of mussels including the state endangered brook floater, green floater, yellow lampmussel, and triangle floater. The green floater is also a Federal species of concern. In 1994, the Maryland Natural Heritage and Wildlife Diversity Program conducted a survey of mussel species occurring in Sideling Hill Creek and the Potomac River between Allegany and Montgomery Counties. A thorough survey of mussel species occurring in Sideling Hill Creek on TBBTF was conducted as part of the larger survey. The survey identified five species of mussels on TBBTF. Only two of the mussel species identified on the facility during the survey were represented by live animals. Mussel species identified on TBBTF during the survey included the interior squawfoot, eastern spike, green floater, atlantic spike, and the pocketbook mussel. The green floater, Atlantic spike, and pocketbook mussel were represented only by spent shells (Boyle and Maclvor, 1995).

The introduced Asian clam was also identified during the mussel survey on TBBTF. The Asian clam displays life-history traits that are well adapted for life in unstable, unpredictable habitats and, as a result, has become the most invasive of all North American freshwater bivalve species. The Asian clam is now the most predominant mussel species occurring in Maryland. The clam could become a direct threat to native mussels occurring in Sideling Hill Creek due to its prolific nature and ability to compete directly with native clams.

The Olympia marble (*Echloe olympia*) a butterfly listed in the state as rare, has been documented to occur in small numbers on the Boy Scout Barren. Several other species of

Lepidoptera, including several rare species, have the potential to occur on TBBTF in association with shale barrens and other habitats on the property. A tiger beetle (*Cicindela ancocisconensis*) which is state endangered also occurs on TBBTF in association with Sideling Hill Creek.

### **3.15 FLORA**

A floral inventory of TBBTF has not been conducted. A list of tree and shrub species common to the area is included in Appendix C. Vegetative communities on TBBTF vary based on particular features of the site such as slope, aspect, soil characteristics and past site disturbance. The following sections provide a general characterization of vegetation occurring on TBBTF. Vegetative communities described include those found on north facing slopes, dry ridges and south slopes, shale barrens, floodplains, and early successional woodlands and recovering abandoned fields. A discussion of invasive plant species occurring on TBBTF is presented in Section 3.15.6. Additional discussions of flora occurring on TBBTF are included in Sections 3.9, 3.10, 3.11, 3.12, 3.13, and 3.16.

#### **3.15.1 North facing slopes**

Typical vegetation occurring on north facing slopes on TBBTF includes eastern hemlock, blackgum (*Nyssa sylvatica*), white oak, black birch, red oak, pignut hickory, shagbark hickory, mockemut hickory, great laurel, eastern white pine, and basswood. The understory occurring on north facing slopes typically includes flowering dogwood, serviceberry, witch hazel, and black huckleberry. Hemlock dominates the overstory of some of the north facing slopes particularly at lower elevations. Upper slopes of the north facing slopes are typically dominated by oaks (MDNHP, 1995).

#### **3.15.2 Dry ridges and south slopes**

Typical tree species found on the dry ridges and south facing slopes on TBBTF includes black oak, chestnut oak, scarlet oak (*Quercus coccinea*), pignut hickory, mockemut hickory, Virginia pine, table mountain pine, black locust, scrub oak (*Quercus ilicifolia*), red cedar and tree of heaven (*Ailanthus altissima*). Tree of heaven is an exotic invasive species introduced from China. Shrubs typically found on the slopes include deerberry, black raspberry, maple-leaved viburnum and winged sumac (*Rhus copallina*) (MDNHP, 1995).

#### **3.15.3 Shale barrens**

The shale barrens on TBBTF are generally characterized by open vegetation with Virginia pine, various oak species, white ash, blackgum, and hickories in the overstory. Shrubs are sparse but commonly include scrub oak, dwarf hackberry, blueberry, witch hazel, serviceberry, fragrant sumac, and downy arrowwood. Herbaceous species typically found on the shale barrens include moss pink, dittany, hairy beardtongue (*Penstemon hirsuties*'), butterfly weed, spiderwort, Pennsylvania sedge, Willdenow's

sedge, crinkled hairgrass, slender knotweed, hairy lip fem, blunt nosed woodsia, tinker's weed, flowering spurge, hairy bush clover, bottlebrush grass, Canada's brome grass, Bose's panic grass, forked chickweed, white flowered leafcup, and woodland sunflower. Several endemics including three flowered melicgrass, shale barren primrose, shale barren goldenrod, and pussytoes ragwort also occur on the shale barrens (see Section 3.13 for additional plant species found on the shale barrens of TBBTF) (MDNHP, 1995).

#### **3.15.4 Floodplains**

Tree species commonly found on the floodplains of TBBTF include sugar maple, yellow poplar (*Liriodendron tulipifera*), red oak, white oak, bittemut hickory, white ash, sycamore, black walnut, butternut, cucumber tree, river birch, boxelder, slippery elm, red maple (*Acer rubrum*), silver maple, black maple, black cherry, and ironwood. Shrubs and small trees typically occurring in the floodplains include witch hazel, spicebush, paw paw, redbud, flowering dogwood, silky dogwood (*Cornus amomum*), elderberry and serviceberry. Additional woody plant species occurring in the floodplains include poison ivy, buttonbush, spreading dogbane, common greenbriar and St. John's-wort. Herbaceous species occurring in the floodplains are diverse and typically include wing stem, deertongue, Virginia wild rye, Virginia creeper, jewelweed, Christmas fem, tall meadow rue, golden ragwort, wreath goldenrod, boneset, and May apple (see Section 3.13 for additional species occurring on the floodplains of TBBTF).

#### **3.15.5 Successional woodlands and recovering abandoned fields**

Tree species typically occurring in early successional woodlands and abandoned fields on TBBTF include black cherry, red maple, river birch, black locust, boxelder, elms, sassafras, yellow poplar, and Virginia pine. Areas that have been cleared, such as the power line right of way that parallels Pearre Road, develop a herbaceous layer characterized in dry areas by slender false foxglove, wild yellow flax, loin's-foot, shaved sedge, charming sedge, stellate sedge, meadow-geranium, dwarf hawthorn, dittany, crinkled hairgrass, Willdenow's sedge, narrow-leaved mountain mint, hispid buttercup, prairie wedgegrass, and wood vetch. Herbaceous vegetation occurring on slopes that were recently impacted by fire on TBBTF (see Section 3.13.13) includes intermediate wood fem, ebony spleenwort, downy false-foxglove, hay-scented fem, widow's tears, small-flower phacelia, early saxifrage, erect goldenrod, and tall agrimony. Sedges occurring in the area impacted by fire include Willdenow's sedge, White Bear Lake sedge, ambiguous sedge, head-bearing sedge, finger sedge, slightly hirsute sedge, Pennsylvania sedge, umbel-bearing sedge, Muhlenberg's sedge, foxtail sedge, and stellate sedge. Grass species occurring on the slope include mostly perennial species characteristic of woodlands and woodland edges including Bose's panic grass, variable panic grass, bushy panic grass, low panic grass, nodding fescue (*Festuca obtusa*), Canada bluegrass, prairie wedgegrass, upland bent grass, and poverty grass. Barren brome grass, a non-native annual grass, also occurs in the area (MDNHP, 1995).





**Figure 3-10. Recent beaver activity on the floodplain of Sideling Hill Creek**



**Figure 3-11. A nest cavity in a snag on TBBTF**





**Figure 3-12. Northern fence lizards on TBBTF**

### 3.15.6 Exotic invasive plant species

Invasive plant species occurring on TBBTF present a threat to several species of native plants that occur on the facility. The following section provides brief descriptions of invasive plant species that are known to occur on TBBTF and observed locations of the plants on the facility. The observed locations of the plants are not inclusive of all areas that invasive species may occur on the facility. The locations of invasive plants presented below are based on the 1995 MDNHP survey and preliminary reconnaissance conducted on TBBTF in March and May of 2000. Section 5.13 provides recommended approaches for developing a more comprehensive characterization of the extent of invasive plant species on TBBTF and recommended management of the species discussed below.

**Microstegium (*Microstegium vimineum*)** a native grass of Asia, is the most prevalent invasive plant species occurring on TBBTF. Microstegium is an annual grass that forms dense mats with somewhat reclining stems growing up to 40 inches in length. The grass prefers shaded moist soils on floodplains, streamsides, low woods, and wetlands. Microstegium cannot tolerate standing water but its seeds can survive and germinate after extended periods of inundation. Microstegium can spread rapidly following a disturbance such as flooding or mowing and within three to five years can form dense monotypic stands that crowd out native herbaceous vegetation. Microstegium occurs on TBBTF along Sideling Hill Creek, its floodplain and adjacent slopes, where it is a threat to native herbaceous vegetation including the federally endangered harperella. Microstegium has spread to some upland areas along existing access roads and has been identified along the roadside adjacent to Straus Lodge. Microstegium also occurs in a dense population along the intermittent stream that flows from the man-made water supply pond to Sideling Hill Creek. The grass has spread into the woods for several hundred feet at places along the intermittent stream. Figure 3-13 is a photograph of early season microstegium growing on TBBTF.

**Arthraxon (*Arthraxon hispidus*)** is an annual grass introduced to the United States from Asia. The grass is similar to microstegium and occurs in floodplain forests, wet ditches, moist pastures, and along streambanks. The grass occurs on the floodplain of Sideling Hill Creek along with microstegium, but in lesser numbers.

**Garlic mustard (*Alliaria petiola*)** is a biennial herb in the mustard family introduced to the United States from Asia and Europe as food or a medicinal herb. Garlic mustard grows in rich, moist, upland forests and along wooded streambanks. It is shade tolerant and readily invades undisturbed forests and disturbed areas such as roadsides and trail edges. The plant does exceptionally well along streambanks because of the disturbance caused by periodic flooding. Garlic mustard is self or cross-pollinated and a single plant can, over time, populate a large area. Prolific seed production and a lack of natural predators allows the plant to quickly dominate the ground cover where it occurs. Floodplain areas are particularly vulnerable to domination by garlic mustard because the seeds are easily transported by water (TN-EPPC, 1997). Garlic mustard occurs on TBBTF along the floodplain of Sideling Hill Creek, in woodlands, and along forest roads



on the facility. Figure 3-14 is a photograph of early season garlic mustard growing in a wooded area on TBBTF.

**Multiflora rose (*Rosa multiflora*)** is a perennial thorny shrub introduced to the United States from Asia in the late 1800s as a root stock for ornamental roses. It was later planted for wildlife food and cover and as erosion control. Multiflora rose produces prolific seeds eaten and spread by birds and other animals. The seeds may remain viable in the soil for 20 to 30 years. The shrub is typically found in fields, pastures, along roadsides, and along fence lines and also occurs in open areas of forests. Multiflora rose forms dense thickets that can choke out native vegetation. The thickets can form dense impenetrable living fences that inhibit passage by large animals. Multiflora rose has been documented to occur in the northeastern corner of TBBTF, in the wooded area adjacent to the man made pond, and in the power line/fire break to Tabler Lodge, but it may also occur at other locations on the facility.

**Morrow's honeysuckle (*Lonicera morrowii*)** is a bush honeysuckle introduced to the United States from Asia and Western Europe. Morrow's honeysuckle which was identified on the floodplain of Sideling Hill Creek in MDNHP, 1995, is one of four species of bush honeysuckles that are invasive in the area. The other invasive bush honeysuckles that could occur in the area include *Lonicera maackii*, *L. tartarica* and *L. X bella*. Due to similarities in the species and an apparent increase in the genus on TBBTF since the MDNHP survey, they will be referred to jointly as bush honeysuckles for management purposes. The bush honeysuckles were introduced in many areas to provide food and shelter for wildlife. The shrubs are also planted as ornamentals. The bush honeysuckles are tolerant of a variety of soil and environmental conditions and typical habitats include disturbed successional communities, wetlands, woodland edges and partially closed forests. The distribution of bush honeysuckle seed is primarily accomplished by birds and small mammals. Bush honeysuckles grow vigorously and can inhibit the development of native shrubs and herbaceous ground cover. The bush honeysuckles leaf out early and can also inhibit the development of spring ephemerals that have evolved to bloom before native trees and shrubs leaf out. The shrubs may entirely replace native species over time (TN-EPPC, 1997). Bush honeysuckle occurs in places on the floodplain of Sideling Hill Creek, and has established a dense population on the floodplain adjacent to the Sideling Hill Creek stream crossing for light infantry training. Figure 3-15 is a photograph of bush honeysuckle growing in the floodplain adjacent to the stream crossing. Individual bushes were also identified in the North Central Floodplain area. Bush honeysuckle also forms a dense population along the access road in the northern section of TBBTF and occurs in other places in smaller populations, or as single bushes, adjacent to roads across the facility.

**Japanese Honeysuckle (*Lonicera japonica*)** is a perennial climbing or trailing evergreen vine that was introduced to the United States from Japan for its value as an ornamental, as erosion control, and for wildlife cover. Japanese honeysuckle is associated with disturbances within or along woodlands, roadsides, fencerows, pastures, old fields, and canopy gaps. Once established, Japanese honeysuckle can endure low sunlight levels without noticeable growth, then grow vigorously when light is increased. Honeysuckle thrives in fertile nitrogen rich soil where an established colony will spread rapidly until

nitrogen poor soils are encountered. The plant reproduces vegetatively through stolons that develop new roots and shoots at short intervals. Japanese honeysuckle also spreads by seeds that are widely dispersed by birds. The vine can form a dense groundcover that completely occupies a habitat or may reach canopy height by twining around and growing with other vegetation. The plant may girdle the stems of adjacent vegetation or overtop smaller shrubs and trees (TN-EPPC, 1997). Japanese honeysuckle has been identified along the access road in the northern section of TBBTF along with bush honeysuckles.

**Barren brome (*Bromus sterilis*)**, also commonly known as cheatgrass, is an annual grass introduced to the United States from Europe. The floret of the grass has a stiff barbed awn that penetrates the facial tissue of grazing animals so its forage value is low. The weedy, mid-season grass typically occurs in waste places. On TBBTF the grass occurs as a large population on the Boy Scout Barren. Barren brome also occurs to along Allegany County Line Road and in the woods in the northern section of TBBTF. Figure 3-16 is a photograph of barren brome growing on the Boy Scout Barren.

**Japanese barberry (*Berberis thunbergii*)** is a compact, spiny shrub that commonly grows from two to three feet tall. It has small yellow flowers that bloom in May and red berries that mature in mid-summer and stay on the shrub into the winter. Japanese barberry was introduced into the United States from Japan in the late 1800s and has been widely planted as an ornamental, for wildlife, and for erosion control. The shrub easily naturalizes because birds eat its fruit and subsequently spread the seeds. Japanese barberry prefers well-drained soils and is typically found in areas of partial sunlight such as woodland edges, or in open woods, but is also found under the shade of oak canopies. Japanese barberry has been located on TBBTF in the wooded areas adjacent to the man made pond and in the woods adjacent to the main entrance. The shrub probably also occurs at other locations across the facility in small sparse populations.

**Spotted knapweed (*Centaurea maculosa*)** is a biennial herb in the aster family that was introduced accidentally into the United States from Europe. Spotted knapweed grows in dry sterile, gravelly, or sandy openings such as pastures, old fields, and roadsides, and is considered a major threat to shale barrens. The plant has the ability to colonize disturbed areas and once established, may infest adjacent habitats and choke out native vegetation. Spotted knapweed occurs on TBBTF along Allegany County Line Road where it crosses the Boy Scout Barren.

**Yellow day lily (*Hemerocallis flava*)** is a tall perennial lily that was introduced to the United States from Asia. The yellow day lily has basal leaves and perfect yellow fragrant flowers. It blooms over a long period of time, but each flower opens for only one day. The yellow day lily occurs in the floodplain adjacent to the Sideling Hill Creek stream crossing on both sides of the stream, along Allegany Line Road adjacent to the north central floodplain, and probably occurs at other locations within and adjacent to floodplains and access roads across TBBTF.

**Tree of heaven (*Ailanthus altissima*)** is a rapid growing tree capable of reaching heights of 80 feet or more. Tree of heaven is a native of China and was introduced into the

United States as a street and shade tree and by Chinese immigrants for medicinal purposes. The tree has spread from areas where it was planted and has become a serious weed in urban, agricultural and forested areas. The tree readily establishes itself in disturbed areas. One tree can produce as many as 350,000 seeds that establish tap roots three months from germination allowing it to out compete many native plants for sunlight and space. The tree also produces a toxin in its bark and leaves which inhibits the growth of other plants. Tree of heaven is very difficult to remove once it has established a taproot. Seedlings should be removed by hand as early as possible. Larger trees should be cut once in the early growing season and once in the late growing season. The tree will vigorously resprout, but seed production will be prevented. Continued cutting over a period of years may kill the tree. Glyphosate painted onto a freshly cut stump or sprayed onto the leaves will also kill the tree. Glyphosate should be applied in the late growing season when the plant is translocating nutrients to its roots (VADCR, 1999). Tree of heaven occurs on TBBTF along Allegany County Line Road where it crosses the Boy Scout Barren.

**Great mullein (*Verbascum thapsus*)** is a biennial, perennial or rarely an annual with a deep tap root. In its first year, great mullein produces a low vegetative rosette which overwinters and is followed in the succeeding growing season by a stout flowering stem. Great mullein is a native of Europe and Asia that was probably introduced into the United States as a medicinal herb. The plant is typically found in neglected meadows and pasture lands, along fence rows and roadsides, and in disturbed areas. Great mullein is easily out competed in areas with a densely vegetated ground cover, but readily grows in disturbed areas. A single plant can produce over 100,000 seeds that may remain viable for over 100 years. Great mullein is an ephemeral plant and is eventually displaced by other vegetation on undisturbed sites. The plant occurs on TBBTF scattered across the slopes of Strauss Barren and sparsely on the Boy Scout Barren.

### **3.16 RARE, THREATENED AND ENDANGERED SPECIES**

A survey of rare, threatened and endangered species and significant habitats (see Section 3.13) was conducted on TBBTF in 1993 and 1994 by the Maryland Department of Natural Resources under the Natural Heritage and Wildlife Diversity Program.

One federally endangered plant species, harperella was identified on TBBTF during the 1993-1994 survey. In addition, 21 Maryland State listed threatened or endangered species were identified on TBBTF including three fauna and 18 flora species. Table 3-5 provides a list of Federal and state listed threatened, and endangered species identified on TBBTF; their preferred habitats; general location on TBBTF; and rank and status. Table 3-6 provides a key to the Federal and state status and global ranks used in table 3-5. In addition, 23 State Rare or Watchlist plant species were identified on TBBTF. Table 3-7 provides a list of the State Rare and Watchlist plants, their preferred habitats, and general location on TBBTF. Appendix D provides a list of additional state listed rare, threatened or endangered plants that occur in the region around TBBTF.

The Federal and state endangered plant harperella, which occurs on TBBTF, is a small member of the carrot family (*Apiaceae*) native to seasonally flooded rocky streams in Maryland, West Virginia, North Carolina, Alabama, and coastal plain ponds in South Carolina. Harperella also occurs at one location in Georgia on a granite outcrop. At present, half of the historically known harperella populations no longer exist. There are approximately ten known remaining populations of the species. Although populations of harperella along the Potomac River at Hancock and Harpers Ferry were among those that have disappeared, one significant population remains in Maryland, on Sideling Hill Creek. Another very small population occurs on Fifteen Mile Creek in Allegany County.

Harperella only occurs in a narrow band of water depths and does not tolerate dry conditions. The plant is also incapable of completing its life cycle if water depths are too deep. Its habitat is flooded in most years during winter and spring and is at, or just above, the water line in the summer and fall. Suitable habitat for harperella regularly shifts due to the dynamic nature of the stream channel and floodplain. High water and floods create, change and destroy habitat for the harperella on an annual basis. In Maryland, harperella occurs on rocky and sandy shoals, on the margins of clear swift flowing stream reaches and rarely on the muddy banks of seasonally flooded sections of streams. The largest sub-populations are usually found in sunny areas along streams. The plants flower in July and August. In Maryland, the seeds germinate in September and then overwinter as evergreens under high water. The plants grow and produce flowering stems the following season (USFWS, 1990).

The primary threats to the persistence of harperella are manipulations of water flow and poor water quality. Because harperella tends to occupy a narrow range of water depths, manipulations of water flow upstream of populations can easily destroy suitable habitat by inundation or persistent desiccation. Natural fluctuations in flow can also result in significant yearly variations in populations. Small sub-populations are particularly susceptible to loss during high water events. Harperella is also apparently sensitive to degradation of water quality resulting from siltation or pollution (USFWS, 1990).

Sideling Hill Creek supports one of the largest remaining populations of harperella. Harperella is the only federally listed species on TBBTF. A significant portion of the harperella population in Maryland occurs along Sideling Hill Creek and on TBBTF. Habitat conservation activities for harperella in Maryland have been concentrated along Sideling Hill Creek under a cooperative effort between TNC, Western Pennsylvania Conservancy, Maryland Natural Heritage and Wildlife Diversity Program, and USFWS. The conservation efforts have concentrated on habitat protection through landowner contact, land acquisition, conservation easements, and voluntary agreements with landowners to protect shorelines; public outreach through the local media, newsletters, volunteer activities, and field trips; land use planning directed at preserving harperella habitat; and public land management designed to ensure that habitat quality for harperella is maintained. As part of the public land management efforts, TBBTF was surveyed by the Maryland Natural Heritage and Wildlife Diversity Program (MDNHP, 1995). The study, commissioned by MDARNG, inventoried the facility for Federal and state rare species, including harperella; described the populations, their habitats, and threats to the habitats; and defined management needs. Specific issues raised as a result of the study

included potential ways to accommodate training on the facility while avoiding impacts to harperella and other rare species, and approaches to address invasive weed populations on TBBTF (see Section 5).

The Nature Conservancy has been monitoring populations of harperella in Sideling Hill Creek since 1988. Monitoring efforts have been designed to track the vigor and health of harperella populations and to record the health and stability of occupied habitats. Monitoring studies indicate that harperella populations remained stable along the creek between 1988 and 1995. Extreme flooding occurred on Sideling Hill Creek in January of 1996, followed by unusually heavy rainfall throughout the spring, summer, and fall of the year. Monitoring conducted in the late summer indicated that populations of harperella remained within the ranges recorded in the past for the creek. A major drought occurred in Maryland during 1997 that lasted into late November. Monitoring indicated that the number of stands remained the same as those recorded in 1996, but that the number of plants in the stands decreased dramatically. Scouring associated with flooding along with substantial reworking of stream habitats could account for the reductions in population size. Flooding also potentially increased the availability of habitat for microstegium, accounting for recent increases in populations of the invasive species on TBBTF. It is not clear whether microstegium poses a direct threat to harperella populations on TBBTF. The two species, although they occur adjacent to each other along the creek, have different habitat requirements. Harperella requires periods of inundation while microstegium cannot survive in inundated habitats. Microstegium may have an indirect impact on harperella resulting from decreases in plant species diversity in habitats adjacent to the harperella populations (see Section 5 for proposed management of harperella and microstegium on TBBTF).

### **3.17 CULTURAL RESOURCES**

#### **3.17.1 Prehistoric Period**

**Paleo-Indian Period (12,000 to 7,500 BC).** The earliest recognized occupation of western Maryland dates to the Paleo-Indian period. Geological and palynological evidence indicates that the western section of Maryland maintained a colder climate than during subsequent periods and supported a closed coniferous forest. The climate was characterized by hard winters with brief summers. Although typical reconstruction of Paleo-Indian lifeways stresses the importance of large cold adapted game, subsistence was probably more diversified. Paleo-Indians were nomadic hunters and gatherers who lived in small groups residing in seasonal or base camps. Their camps are rare and usually very small. Paleo-Indian occupation is characterized by the use of distinctive fluted points (i.e. clovis points), bifacial knives, drills, graters, burins, flake cores, scrapers, and flake tools with no formalized shapes (LBA, 1993). Evidence of Paleo-Indians in Western Maryland is restricted to isolated projectile point finds. Reported finds include one projectile point from Rawlings, one from near Oldtown, one from Moorefield West Virginia, and six from Garrett County (Mash, 1996).





**Figure 3-13. Early season microstegium growing on TBBTF**



**Figure 3-14. Early season garlic mustard growing on TBBTF**



**Archaic Period (7,500 to 1,000 BC).** Between 10,000 and 5,000 years before present, substantial ecological changes occurred across the North American continent. During the Archaic period the cold, dry climate that existed during the Paleo-Indian period changed to a warmer and wetter environment. Game animals were typically smaller than those of the Paleo-Indian period and included deer, smaller mammals, birds and fish. Cultural changes were rapid and dependence on plant food sources became more intense. The major settlement focus appeared to be on the floodplains of major watercourses with movement within the foothills and low mountain valleys (Mash, 1996).

The Archaic period is divided by archaeologists into three time periods, Early Archaic Period, Middle Archaic Period and Late Archaic Period. The Early Archaic period dates from 7,500 to 6,000 BC and is characterized by elaborations of earlier Paleo-Indian cultures. With the exception of diagnostic projectile points, adaptive lifestyles remained basically unchanged with an orientation toward hunting related activities.

The Middle Archaic Period which extended from 6,000 to 4,000 BC is not well represented by diagnostic artifacts in western Maryland. Much of the present knowledge of the period is based on type categories recognized and developed from other areas (LBA, 1993).

The Late Archaic period extended from 4,000 to 1,000 BC and is characterized by specialized hunters and gatherers. Late Archaic populations appear to have developed a well-defined and scheduled round of settlement and subsistence, intensifying their use of resources such as fish. The emphasis on settlement patterns appeared to be hunting and hunting related activities, including fishing. Village sites were established according to function. Base camps were usually found along major river floodplains. Late summer, early fall sites were located for the collection and exportation of nuts and acorns. Upland base camps were usually located near good springs and workshop camps have been found near sources of desirable stone. The Archaic Indian's lifestyle gradually broadened from nomadic towards increased sedentism. The increasingly sedentary lifestyle resulted in a shift from settlement in temporary hamlets to permanent villages (Mash, 1996).

In the mountain areas of the ridge and valley province, populations reached their highest concentration sometime around 1,000 to 2,000 BC. Populations of the Indian continuously declined after this period until the end of their existence (Mash, 1996).

**Woodland Period (1,000 BC to 1,600 AD).** The transition period from the Archaic to the Woodland Era is sometimes characterized in the region by the introduction of ceramics, the elaboration of burial ceremonies, and heightening of religious awareness (Mash, 1996). The subsistence culture of the Woodland people was similar to that of the Archaic Period.

The Woodland Period can be divided into the Early Woodland Period (1,000 BC to 500 BC), the Middle Woodland Period (500 BC to 900 AD), and the Late Woodland Period (900 AD to 1600 AD). The Early Woodland Period was marked by the introduction of ceramics. The trends towards sedentism and subsistence specialization that began in the



**Figure 3-15. Bush honeysuckle growing in the floodplain of Sideling Hill (Creek**



**Figure 3-16. Barren brume growing on the Boy Scout Barren**

**Table 3-5**  
**Federal and State Listed Threatened and Endangered Species Known to Occur on TBBTF**

Scientific Name	Common Name	Preferred Habitat	General Location on TBBTF	Federal/State Status and Global Rank
<b>Fauna</b>				
<i>Cicindela ancocisconensis</i>	tiger beetle	dry silty sand; middle to lower floodplain; adjacent to the stream channel	shoreline of Sideling Hill Creek; South Central Ridge and Floodplain	SE/G4
<i>Euchloe olympia</i>	Olympia marble (a butterfly)	open areas, including shale barrens, open woodlands, and foothill; host and food plants include rock cresses, chickweed, phlox, and houstonia	Boy Scout Barren	SI/G4
<i>Lasmigona subviridis</i>	green floater (a mussel)	faster flowing water with pebble and cobble substrates	Sideling Hill Creek (occurrence represented by spent shell)	SE/G4
<b>Flora</b>				
<i>Adlumia fungosa</i>	climbing fumitory	partial shade; rich moist soil; wooded	North Ridge	ST/G4

Scientific Name	Common Name	Preferred Habitat	General Location on TBBTF	Federal/State Status and Global Rank
		mountain areas		
<i>Bromus latiglumis</i>	broad-glumed brome	alluvial woods and riverbanks	Lower Sideling Hill Creek Floodplain and East Slopes	SE/G5
<i>Carex radiata</i>	stellate sedge	open woods	Lower Sideling Hill Creek Floodplain and East Slopes; Carex Fire Slope	SE/G4
<i>Carex tetanica</i> var. <i>woodii</i>	Wood's sedge	moist floodplain forests; fields; wooded areas	Lower Sideling Hill Creek Floodplain and East Slopes; South Central Ridge and Floodplain	SE (extirpated)/ G4Q
<i>Chenopodium standleyana</i>	Standley's goosefoot	mesic forests; open woods; thickets	Straus Barren	SE/G5
<i>Euphorbia obtusata</i>	blunt-leaved spurge	woods; fields; roadsides	Boy Scout Barren	SE/G5
<i>Helianthus microcephalus</i>	small-headed sunflower	moist woods	Lower Sideling Hill Creek Floodplain and East Slopes; North Central Floodplain	SE/G5

Scientific Name	Common Name	Preferred Habitat	General Location on TBBTF	Federal/State Status and Global Rank
<i>Iris cristata</i>	crested iris	moist wooded hillsides; rich woods on cliffs; or along streams	Lower Sideling Hill Creek Floodplain and East Slopes; South Central Ridge and Floodplain	SE/G5
<i>Melica nitens</i>	three-flowered melicgrass	rocky woods	Straus Barren; Boy Scout Barren	ST/G5
<i>Platanthera flava</i>	pale green orchid	moist sandy soils; floodplains in full sun to nearly full shade	Lower Sideling Hill Creek Floodplain and East Slopes	ST/G4
<i>Polygala polygama</i>	racemed milkwort	dry woods	Lower Sideling Hill Creek Floodplains and East Slopes	ST/G5
<i>Prunus alleghaniensis</i>	Alleghany prune	thickets and borders of woods in the mountains; on shaly soils in Alleghany County	Boy Scout Barren; North Ridge	ST/G3
<i>Ptilimnium viviparum</i>	harperella	rocky and sandy shoals on the margins of swift flowing streams	Sideling Hill Creek	FE/SE/G2
<i>Solidago hispida</i>	hairy goldenrod	dry soils of open woods and rocky slopes	Lower Sideling Hill Creek Floodplain and East Slopes	SE (extirpated)/ G5

Scientific Name	Common Name	Preferred Habitat	General Location on TBBTF	Federal/State Status and Global Rank
<i>Synosma suaveolens</i>	sweet-scented Indian plantain	moist soils in woodlands and on riverbanks	North Central Floodplain	SE/G4?
<i>Taenidia montana</i>	mountain pimpernel	Devonian shales of Allegany and Washington Counties; rocky or dry woodlands	Boy Scout Barren; South of Sideling Hill Creek-Floodplain/Barren	ST/G3G4
<i>Woodsia ilvensis</i>	rusty woodsia	shaly cliffs in Allegany and Washington Counties	Big Pool Face and Vicinity	ST/G5
<i>Zanthoxylum americanum</i>	northern prickly-ash	partial shade or partial sun to full sun; moist to wet soil	Boy Scout Barren	SE/G5

Source: MDNHP, 1995; Brown and Brown, 1984; Brown and Brown, 1972; Hitchcock, 1971

**Table 3-6**

**Key to Federal/State Status and Global Ranks Used in Table 3-5**

- FE Federally Endangered: A species that is in danger of extinction throughout all or a significant portion of its range.
- SE State Endangered: A species whose continued existence as a viable component of the state's flora or fauna is determined to be in jeopardy.
- ST State Threatened: A species that appears likely within the foreseeable future to become endangered in the state.
- SI State In Need of Conservation: A species whose population is limited or declining in the state such that it may become threatened in the foreseeable future if current trends or conditions persist.



- G1 Critically imperiled globally due to extreme rarity; generally five or fewer current, or naturally occurring, viable populations in the world.
- G2 Imperiled globally due to extreme rarity; generally six to 20 current or naturally occurring, viable populations in the world.
- G3 Either very rare throughout its range (21 to 100 occurrences), or found locally in a restricted range (possibly locally abundant), generally with 21 to 100 current, naturally occurring, viable populations in the world.
- G4 Apparently secure globally, but may be rare in parts of its range, especially at the periphery of its range.
- G4Q Apparently secure globally, but may be rare in parts of its range, especially at the periphery of its range. The Q indicates that there is taxonomic uncertainty; the numerical rank is assigned to a species that is treated as a subspecies or variety.
- G5 Demonstrably secure globally, but may be rare in parts of its range, especially at the periphery of its range.

Source: MDNHP, 1995

**Table 3-7**  
**State Rare and Watchlist Plant Species Known to Occur on TBBTF**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Preferred Habitat</b>	<b>General Location on TBBTF</b>	<b>Status</b>
<i>Arisaema dracontium</i>	green dragon	low, rich soils along streams	South Central Ridge and Floodplain; Mouth of Sideling Hill Creek (SHC)	watchlist
<i>Calystegia spithamea</i>	low bindweed	dry, sandy or rocky woods and fields	Mouth of SHC	rare
<i>Campanula rotundifolia</i>	harebell	rocky banks and cliffs	Big Pool Face and Vicinity	rare
<i>Cardamine parviflora</i>	small-flowered bittercress	dry soils	Little Barren	watchlist

<b>Scientific Name</b>	<b>Common Name</b>	<b>Preferred Habitat</b>	<b>General Location on TBBTF</b>	<b>Status</b>
<i>Carex tonsa</i>	shaved sedge	dry soils	Lower SHC Floodplain and East Slopes	watchlist
<i>Carex albersina</i>	White Bear Lake sedge	rich woods, often calcareous	South Central Ridge and Floodplain; North Creek Access; Lower SHC floodplain and East Slopes; Carex Fire Slope	watchlist
<i>Desmodium glutinosum</i>	pointed-leaved tick-trefoil	dry, rocky woods	Big Pool Face and Vicinity	watchlist
<i>Heuchera pubescens</i>	downy heuchera	rich woods and rock crevices		watchlist
<i>Juglans cinerea</i>	butternut	rich soil in woods	North Creek Access	rare
<i>Lysimachia lanceolata</i>	lance-leaved loosestrife	moist open woods or shores	South Central Ridge and Floodplain	watchlist
<i>Monarda clinopodia</i>	basal bee-balm	low woods and thickets	Big Pool Face and Vicinity	watchlist
<i>Muhlenbergia sylvatica</i>	woodland dropseed	moist woods or along streams	Big Pool Face and Vicinity; Lower SHC Floodplain and East Slopes	watchlist
<i>Oenothera argillicola</i>	shale barren primrose	Devonian shales	Straus Barren	watchlist

<b>Scientific Name</b>	<b>Common Name</b>	<b>Preferred Habitat</b>	<b>General Location on TBBTF</b>	<b>Status</b>
<i>Penstemon laevigatus</i>	smooth beardtongue	rich woods and fields	Lower SHC Floodplain and East Slopes	watchlist
<i>Poa alsodes</i>	grove meadow grass	rich moist woods	Lower SHC Floodplain and East Slopes	rare
<i>Scutellaria ovata</i>	heart-leaved skullcap	woodlands	Boy Scout Barren	watchlist
<i>Senecio ant emar iifolius</i>	pussytoes ragwort	dry shaley soils	Straus barren; Ziegler Bridge Barren; Mouth of SHC	watchlist
<i>Silphium trifoliatum</i>	three-leaved rosinweed	open areas, woodlands, thickets	North Central Floodplain; South Central Ridge and Floodplain	watchlist
<i>Spiraea betulifolia</i>	corymbed spirea	rocky slopes and streambanks	Little Barren; Northeast Woodlands	watchlist
<i>Tilia heterophylla</i>	white basswood	rich woods	Boy Scout Barren; North Ridge; Big Pool Face and Vicinity	watchlist
<i>Trautvetteria carolinensis</i>	Carolina tassel-rue	streambanks and wooded areas	Big Pool Face and Vicinity	watchlist
<i>Trichostema setaceum</i>	narrow-leaved bluecurls	sandy fields and pine woodlands	Straus Barren	rare

Scientific Name	Common Name	Preferred Habitat	General Location on TBBTF	Status
<i>Zizia aurea</i>	golden alexanders	ditch margins, moist meadows, and woods	Lower SHC Floodplain and East Slopes	watchlist

Source: MDNHP, 1995; Brown and Brown, 1984; Brown and Brown, 1972

Late Archaic continued and were accompanied by the introduction and development of cultivated crops. Ceramic development resulted in the ability to store food which supported the establishment of long term settlements (LBA, 1993). The bow and arrow was also invented sometime around the end of the Middle Woodland Period. The date of the introduction of the bow and arrow is believed to have been around 800 AD (Marsh, 1996).

The Middle Woodland Period in Western Maryland is expressed by the appearance of burial mounds (cairns). Small earthen mounds have been found in western Maryland. Simple stone cairns located on natural hilltop features characterize many of the mounds in the area. The Middle Woodland settlement is characterized by a greater reliance on food production, including cultivation of maize and beans. Large group settlements were located on floodplains of high order streams, where the burial cairns were also located (LB A, 1993).

The Late Woodland Period in western Maryland is characterized by the appearance of triangular projectile points and an agricultural based economy. Subsistence during the Late Woodland Period was dominated by domesticated plants, and supplemented by hunting, fishing, and the collection of wild plants. Sites of the period are dominated by settlements consisting of farming orientated villages located on major floodplains. Most of the sites are hamlets consisting of around a half dozen houses clustered on a high spot located in the middle of fields and near to the riverbank (Mash, 1996). Adjacent upland areas were probably frequented for hunting, gathering and other forays.

### 3.17.2 Historic Period

Settlers first moved into the fertile bottomlands of the Potomac River in the area around TBBTF about 1750. By the time the first European settlers moved into western Maryland all of the Indian villages and camps had disappeared. The first road was built through the forest during the French and Indian Wars to supply Fort Cumberland from Fort Frederick. The road, known as Oldtown Road, was later used as a stagecoach route. Oldtown Road served as a major artery until the turnpike road was built in 1820. The turnpike road later became Route 40 (DNR, 1993).

Pioneer settlements established along the fertile, and flatter, areas adjacent to the Potomac River and along creek bottoms of tributaries to the Potomac. The rugged interior areas were left largely intact until 1829.

In 1825, Congress chartered the C&O Canal Company to build a canal alongside the Potomac River from Washington, DC to Cumberland, Maryland. The original plan for the canal was for it to continue across the mountains and connect to the headwaters of the Ohio River. Work on the canal began on July 4, 1828. By 1839, the Canal Company had opened 134 miles of canal from Georgetown to near Hancock. The remaining 50 miles of the canal to Cumberland was completed in 1850. The canal was not extended beyond Cumberland for financial reasons. The B&O Railroad reached Cumberland eight years earlier on its route westward. The canal was rendered obsolete by the railroad, but still conducted a reasonable trade for several decades. Coal, agricultural products, lumber and building stone were transported along the canal. In 1875, its peak year of operation, the canal transported nearly a million tons. Damage incurred to the canal by a flood in 1924 ended navigational use of all but the lower five miles of the canal (Mackintosh, 1991).

The first mention of a sawmill in Allegany County appeared in a 1774 land patent (Mash, 1996). The early sawmills primarily sold wood to the settlers in the area. By 1815 water driven sawmills existed up and down every major stream in the area around TBBTF. The invention of the steam engine enabled sawmills to be located away from streams and into the surrounding mountains and the B&O Railroad and C&O Canal provided reliable transport of lumber to markets. Between 1830 and 1840 large areas of the mountains were patented and purchased for lumber and tan bark production. The William Carrol/Richard Caton venture was established in 1829 and lasted for several decades. The venture consisted of a mining, manufacturing and timber company that was established to exploit mineral and timber resources. Attempts were made at manufacturing iron, but failed (DNR, 1993).

By 1880, there was not a virgin stand of timber left in Allegany County. Between the years of 1880 to 1914 most of the area around TBBTF was cut over by logging firms that utilized logging railroads for access. After the tree cover was removed the land was reportedly burned.

Apple orchard development and promotion in the early 1900's was the most significant venture to occur in the area. Orchard companies bought up approximately 45,000 acres and subdivided them into ten-acre parcels. The parcels were sold as investment properties. Five acres of each parcel were cleared, burned and planted in apple trees. The remaining five acres were timbered for their best trees leaving only the poorer trees standing. The venture was not successful and over time the orchard companies went out of business. The interests of the last orchard were acquired by the State Department of Forestry in 1931 (DNR, 1993).

Acquisition of the Sideling Hill Wildlife Management Area (SHWMA), which encompasses TBBTF, was initiated in 1927 when the Maryland Game and Conservation Department purchased 1,981 acres from the Washington Orchard Company. The management area currently encompasses 3,016 acres. At the time of the original

acquisition the majority of the SHWMA was privately owned by the Orchard Company. Most of the land was kept in forested habitat and open field areas were occupied by working apple orchards (Rohrback, 1997).

The SHWMA played an important role in the early conservation movement in Maryland. The SHWMA was originally purchased and maintained as a game refuge and hunting was restricted. The area was stocked with various game farm wildlife species with the intent of reestablishing them in the area in huntable populations. Pheasants and a variety of other game birds were also raised on SHWMA and released on Sideling Hill and at other locations around Maryland. Current uses of SHWMA are for light infantry training by the MDARNG (TBBTF), camping, etc. by the Boy Scouts of America (TBBTF), public hunting and fishing, mushroom hunting, bird watching, and nature appreciation.

The Lil Aaron Straus Wilderness Area was owned by the Boy Scouts of America until the mid 1980s when it was acquired by the DNR and included as part of the SHWMA. The MDARNG leased the site from the Boy Scouts of America for training from 1974 until its acquisition by DNR. On 11 March 1991 the MDARNG signed a lease agreement with the DNR for continued use of the Lil Aaron Straus Wilderness Area which makes up the TBBTF.

### **3.17.3 Historic Architectural Resources**

There is one permanent family housing unit (Administration House) located on TBBTF adjacent to the access road near the main entrance to the facility off of Ziegler Road (see Figure 3-17). The Administration house, built in 1954, is the residence of the TBBTF Site Manager. The maintenance shop area located adjacent to the Administration house was constructed in 1958 through 1959. The Baker building located behind (east) the Administration house was built in 1999. There are also two cabins on the facility. The Straus lodge, located in the west central section of the facility, consists of a log cabin that was constructed in 1954. Tabler Lodge, located near the southeast corner of the facility, consists of a log cabin originally constructed in the 1920s. The Tabler Lodge was remodeled from the foundation up by the Boy Scouts of America in the early 1950s (MDARNG, 1999). There are also eleven adirondack shelters located on the facility (see Figure 3-17). All of the adirondacks on TBBTF were constructed in the 1960s (MDARNG, 1999). None of the buildings on TBBTF would be considered historic architectural resources. Although Tabler Lodge was originally constructed in the 1920s, its original characteristics were completely changed when the building was remodeled by the Boy Scouts, from the foundation up, in the 1950s.

## **3.18 LAND USE**

### **3.18.1 Land Use On Site**

TBBTF occupies 1,194 acres of predominantly wooded land located in Allegany and Washington Counties approximately 16 miles to the west of Hancock, 100 miles to the west of Baltimore City and 100 miles northwest of Washington, DC. There are three



types of land use areas on TBBTF including the Administrative/Maintenance Area, Camp/Lodge Areas, and the Training Areas. In addition, activities conducted on TBBTF are managed by land use and restricted use areas including the RUA, the 100-meter buffer to Sideling Hill Creek and the General Use Area. Figure 2-1 shows the RUA and the 100-meter buffer to Sideling Hill Creek. The General Use Area includes the area not encompassed by the RUA or the 100-meter buffer to Sideling Hill Creek. Foot traffic is limited in the RUA as established in the lease agreement between the MDARNG and DNR. Additional restrictions in the RUA include: no use of fire arms except as allowed for public hunting on the eastern side of Sideling Hill Creek; no rappelling, except at the approved site at the east end of the Straus Barren; no use of motorized vehicles, except for emergency vehicles; no construction of any kind; no training on, or use of, any areas containing shale barrens or endangered or threatened species of plants or animals; and no camping. Additional access restrictions are placed within a 100-meter buffer on both banks of Sideling Hill Creek. Cutting or clearing of vegetation is restricted throughout TBBTF and prohibited in the RUA and 100-meter buffer. In addition, ground excavation associated with training activities, use of portable latrines, and burning of fires outside of designated fire pits is prohibited throughout TBBTF. The Administrative/Maintenance Area, Camp/Lodge Areas and Training Areas are discussed below.

**Administrative/Maintenance Area.** The administrative and maintenance area is located in the west central section of the facility adjacent to the main entrance to TBBTF off of Ziegler Road. The area includes the Administration House, maintenance sheds and the Baker Building. The Baker Building is a large multi-purpose utility building equipped with three offices, kitchen, latrines and showers.

**Camp/Lodge Areas.** There are eleven adirondack shelters located on seven campsites on TBBTF. There are three additional permanent campsites also located on the facility (see Section 3.21.2). The approximate locations of the camps and other buildings on TBBTF are shown in Figure 3-17. None of the campsites are used on a continuous basis. All camp areas on TBBTF are located on the west side of Sideling Hill Creek and are outside of the RUA and 100-meter buffer to Sideling Hill Creek. Straus and Tabler Lodges are the only two closed-in lodge areas on TBBTF outside of the Administrative/Maintenance Area. Straus Lodge is located in the west central section of the facility and consists of a log cabin with latrine/shower, complete kitchen, central air, oil heat, and a fireplace. Tabler Lodge is located near the southeast corner of the facility and consists of a log cabin with outside latrine, complete kitchen, fireplace, and water. Tabler lodge is sometimes used for command and control during training operations.

**Training Areas.** Land navigation training areas encompass most of the area available for training on TBBTF. A permanent land navigation course with established global positioning system (GPS) stations is located on the west side of Sideling Hill Creek on the facility. Land navigation training is also conducted on the east side of the facility (Woodmont Section). GPS stations used during training on the Woodmont Section are removed following the training operations. Mountaineering training is conducted at the established permanent site located on the east end of the Straus Barren. The site has an established command post and is currently used for rappelling training. Additional mountaineering training activities planned for the site include safety-training, knots and

ropes, rope bridge training, repel slide and climbing training. Training activities are restricted along Sideling Hill Creek and crossing of the stream during training activities is restricted to the Ziegler Road Bridge and the approved instream crossing located approximately 1,000 feet upstream of the Western Maryland Railroad Bridge. Training is restricted on approximately 200 acres on the facility and limited in additional areas located in the RUA and 100-meter buffer to Sideling Hill Creek (see Figure 2-1).

### **3.18.2 Surrounding Land Use**

TBBTF is located in a rural area of Allegany and Washington Counties. The eastern, and part of the northern boundary of the facility is bordered by the Sideling Hill Wildlife Management Area. The area, which is managed by the DNR, consists of more than 3,000 acres of mixed oak-hickory forest straddling Sideling Hill Creek. The western boundary, and a small area on the northern boundary, of TBBTF is bordered by private property. Green Ridge State Forest is located to the west and north of the narrow strip of private property. The state forest comprises over 39,000 acres of approximately 90 year old mixed oak-hickory forest and is managed for lumber products; recreational opportunities; protection of water resources, sensitive habitats and natural areas; and tourism opportunities. The southern boundary of TBBTF is bordered by the Potomac River and the C&O Canal National Historical Park. Morgan County West Virginia lies across the Potomac River along the installation's southern boundary.

## **3.19 FACILITIES**

### **3.19.1 Transportation System**

**Roadways.** Ziegler Road dissects TBBTF from west to east in the northern section of the facility. Ziegler road is public and is the only paved road on the facility. The road becomes Pearre Road after crossing Sideling Hill Creek on the eastern boundary of TBBTF. Allegany County Line Road, an unpaved public access road, runs to the east and north of Sideling Hill Creek and provides access to the northern section of TBBTF. Four access roads intersect Ziegler Road within the boundaries of TBBTF. All site access roads on Ziegler Road within the boundaries of TBBTF are blocked or gated except the main entrance road to the facility. Two of the blocked entrance roads on Ziegler Road provide access to the northern section of the facility and the Washington Camp to the south of Sideling Hill Creek. An additional gated entrance road provides access to the Allegany Camp site area to the south of Ziegler Road. The main access road crosses an unnamed tributary to Sideling Hill Creek then passes the administration house and heads south to the southern boundary of TBBTF, then to the east roughly along the southern boundary of the facility to Sideling Hill Creek, where it ends. The main access road is gated just past the administration house. Two roads intersect the main access road where it turns and heads east. The two roads provide access to camps in the western and central sections of TBBTF.

**Surrounding Roadways.** Ziegler Road, which dissects TBBTF from west to east, turns into Pearre Road to the east of the facility then intersects with Woodmont Road which

ropes, rope bridge training, repel slide and climbing training. Training activities are restricted along Sideling Hill Creek and crossing of the stream during training activities is restricted to the Ziegler Road Bridge and the approved instream crossing located approximately 1,000 feet upstream of the Western Maryland Railroad Bridge. Training is restricted on approximately 200 acres on the facility and limited in additional areas located in the RUA and 100-meter buffer to Sideling Hill Creek (see Figure 2-1).

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**Surrounding Roadways.** Ziegler Road, which dissects TBBTF from west to east, turns into Pearre Road to the east of the facility then intersects with Woodmont Road which

heads north to Route 40 and Interstate 68. To the west of TBBTF, Ziegler Road ends at High Germany Road, which heads north to Orleans Road South. Orleans Road South intersects with Interstate 68 to the north.

**Railways.** The Baltimore and Ohio railroad is located across the Potomac River along the southern boundary of TBBTF. There is no direct access to railway for the training facility.

**Airways.** There are no air transportation facilities on TBBTF. The closest airport to TBBTF is located approximately 16 miles to the northeast of the facility near Hancock.

### **3.19.2 Utilities**

**Potable Water.** Potable water for TBBTF is supplied by ground water. There are six water supply wells located on the training facility. Wells are located at the Main House (drilled to 600 feet), Straus Lodge (drilled to 300 feet), Straus Lodge (drilled to 465 feet), Tabler Lodge (drilled to 385 feet), Allegany Camp (drilled to 295 feet), Baker Building (well depth not available), and at the Pump House along the main access road in the western section of the facility (well depth not available). All wells on TBBTF have ultra violet purifiers.

**Fire Protection.** It is the responsibility of all personnel to exercise care and caution to prevent fires. All fire prevention regulations are strictly adhered to. Fire prevention and protection procedures are described in the clearing procedures forms which are provided to users for each of the camps and shelters. Water supply for fire control is provided by the unnamed man-made lake located in the field adjacent to the Straus Lodge.

Campfires are only allowed in designated areas in constructed fire ring structures. Campfires are allowed, or restricted, based on notification of Green Ridge State Forest.

Training units or other facility users are required to attend fire prevention orientation prior to use of any training facilities. Open fires are prohibited in all training areas and smoking or open flames are prohibited within 50 feet of ammunition, petroleum, or paint storage areas. Written approval from Headquarters STARC is required for the use of pyrotechnics, tracer ammunition, or projectiles.

When a fire is discovered, the Officer in Command (OIC) is responsible for insuring that all personnel take immediate steps to extinguish the fire with the means at hand. If the OIC determines it to be necessary, fire support will be called in from the Orleans Fire Department. If the fire department is called in, command of fighting the fire will be turned over to the senior fire department official when they arrive on the scene.

**Security.** TBBTF is not fenced and Ziegler Road, a public use road, transects the facility from east to west, so the ability to control access to the site is limited. All access roads other than the main entrance road, Ziegler Road, and Allegany County Line Road, which is an unimproved road that accesses the facility to the east of Sideling Hill Creek, are gated or otherwise blocked. The main entrance road passes by the Administration House

and Maintenance Area. Vehicles entering the facility on the main access road are checked to determine if they are permitted for use of the facility. The access road is gated just past the Administration House. Law enforcement on TBBTF is provided from offsite by the Maryland State Police, Hancock Sheriffs Department, and the Maryland Department of Natural Resources Police.

**Wastewater Treatment.** There are 11 latrines on TBBTF servicing the adirondacks, campsites and Tabler Lodge. The latrines are wooden structures with concrete or stone floors placed over self contained septic pits. The latrines are pumped out on an as needed basis. There are also four septic tank and drainfield systems that service the Main House, Tabler Lodge, Straus Lodge, and Baker Lodge. The use of field latrines during training operations is prohibited.

**Storm Drainage.** Due to the steep to very steep topography of TBBTF, storm water runoff is flashy and concentrates into existing natural drainageways. Runoff is concentrated along roadways, particularly where they traverse steep slopes. Drainage ditches along these roadways are incised and are actively downcutting in places. The roads have been graded in places to redirect runoff to side slopes and reduced the development of concentrated flows on the roadways and in the side ditches. All storm water runoff flows to Sideling Hill Creek or it's tributaries, and then into the Potomac River.

**Electricity.** Electric power for TBBTF is provided by Allegany Power. Power is supplied by above ground cable to the Administration House, maintenance facilities, Straus Lodge, and Tabler Lodge and by below ground cable to the Baker Lodge and the main pump house and well.

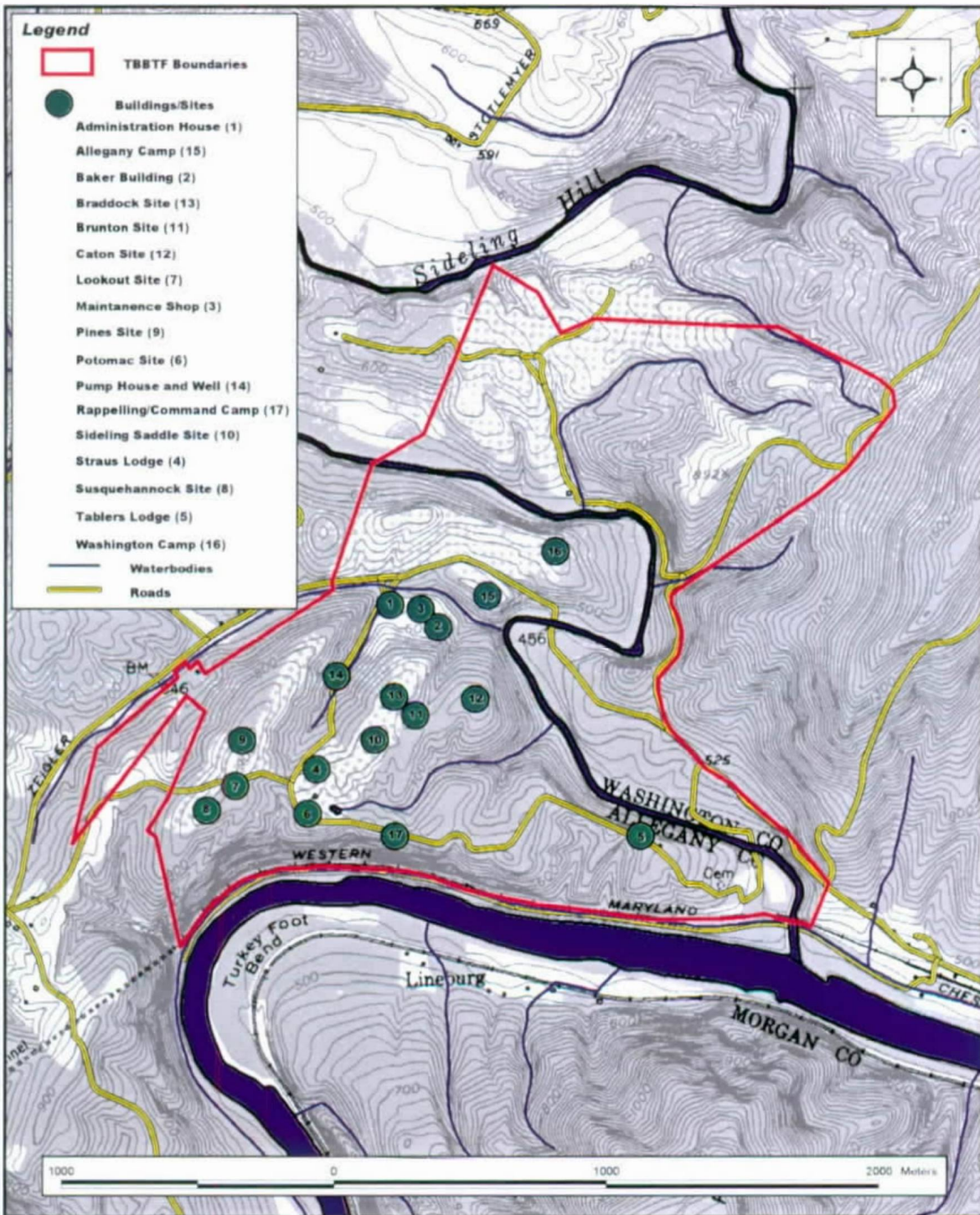
**Heat.** The Administrative House, Straus Lodge, and Baker Building are heated by oil and the pump house is heated by electricity. Tabler Lodge currently has no heat, but it does have a fireplace.

**Communication Systems.** Two phone lines currently access TBBTF. Emergency access phones are being installed at five locations on the training facility and in Baker Lodge, Straus Lodge, and Tabler Lodge. Cell phones are also issued to all units in the field.

**Solid Waste.** Solid waste is collected in a dumpster that is picked up once a week, or as needed, by a private contractor. Additional dumpsters are supplied to TBBTF if needed to support increased usage during training operations.

### **3.20 HAZARDOUS AND TOXIC MATERIALS**

Hazardous waste is defined as any material that requires special methods to prevent contamination of the environment from inherent detrimental characteristics of the waste. Hazardous Waste Management Standard Operating Procedures (HWM SOP) specify the requirements for waste identification, storage, handling, transportation, disposal, emergency response, and waste minimization. The only hazardous materials that are





stored on TBBTF include paints for building maintenance. The training facility does not have a HWM SOP for the handling and storage of hazardous and toxic materials on the site, but they are currently being developed.

### 3.21 SOCIOECONOMIC RESOURCES

The socioeconomic resources of a region are typically characterized in terms of population, housing, and employment. These resources are often interrelated in that an increase or decrease in population could change the demand for housing or employment or a change in area employment could affect the population or housing market in an area. Socioeconomic conditions are usually expressed in terms of total population and density, housing units and vacancy rates, and employment patterns.

#### 3.21.1 Population

Table 3-8 shows population changes from 1980 to 1997 and percent changes over that period for Allegany and Washington Counties. The population of Allegany County has been decreasing since 1980, with a change of over ten percent between 1980 and 1997. The population of Washington County has been increasing, with a change of about 13 percent between 1980 and 1997. The population density for Allegany County was 176.2 persons per square mile in 1990, and for Washington County it was 265.0 persons per square mile (USDOC, 1999). Most of the population for both counties is centered around a few towns. In Allegany County the population is concentrated around Cumberland and Frostburg, and in Washington County it is concentrated around Hagerstown and Hancock. Population density in the vicinity of TBBTF is very low.

#### 3.21.2 Housing

**On-Facility Housing.** There is one permanent family housing unit (Administration House) located on TBBTF adjacent to the access road near the main entrance to the facility off of Ziegler Road (see Figure 3-17). The unit houses the TBBTF site manager. There are also two cabins on the facility. Straus lodge is located in the west central section of the facility and consists of a log cabin with latrine/shower, complete kitchen, central air, oil heat, and a fireplace. Tabler lodge is located near the southeast corner of

**Table 3-8  
Allegany and Washington Counties Population Trends**

	<b>1980 Population</b>	<b>1990 Population</b>	<b>1995 Population</b>	<b>1997 Population</b>	<b>Percent Change 1980-1990</b>	<b>Percent Change 1990-1997</b>
Allegany County	80,548	74,946	73,711	72,289	-7.0	-3.7

Washington County	113,086	121,193	127,122	128,155	7.3	5.6
Total	193,634	196,139	200,833	200,444	0.3	1.9

Source: USDOC, 1998

the facility and consists of a log cabin with outside latrine, complete kitchen, fireplace, and water. There are also eleven adirondack shelters located on the facility. There are four adirondacks with latrines and water located at Allegany Camp in the north central section of the facility adjacent to Ziegler Road. Washington Camp, located to the north of Ziegler Road in the north section of the facility, has two adirondacks and latrines. The Pine Site and Lookout Site located in the western section of the facility both have one adirondack and one latrine. Potomac Site located along the southern boundary of the facility has one adirondack and one latrine and Sideling Saddle and Brunton Sites located in the central section of TBBTF both have an adirondack and a latrine. The only permanently occupied facility on TBBTF is the site manager's house. The cabins and adirondacks are occupied on a temporary basis during training operations by MDARNG personnel or by the boy scouts.

**Off-Facility Housing.** Table 3-9 shows 1990 housing data for Allegany and Washington Counties. Most of Allegany and Washington Counties are rural in character and most of the housing units are single family detached homes (USDOC, 1998).

### 3.21.3 Industry and Employment

The economy of Allegany and Washington County is based on manufacturing, government, retail and wholesale trade, education, and agriculture. TBBTF has a permanent workforce of two people and does not contribute appreciably to the counties' economy. Revenue to the local economy is derived primarily from operating costs for the facility and purchases of food and other supplies during MDARNG training operations or Boy Scout activities.

**Table 3-9**  
**Housing in Allegany and Washington Counties**

	Allegany County	Washington County	Total
Total Housing Units	32,513	47,448	79,961
Owner Occupied	20,719	28,577	49,296
Renter Occupied	8,915	16,185	25,100
Occupied Noncondominium	29,525	44,064	73,589

Occupied Condominium	109	698	807
Vacant	2,879	2,686	5,565

Note: Housing data based on 1990 census statistics

Source: USDOC, 1998

Major employers in Allegany County include Western Maryland Health Systems (2,200 employees), Westvaco Corporation Pulp and Paper (1,878 employees), CSX Transportation (1,000 employees), and Frostburg State University (853 employees). The largest trade industry in the county is the services industry with 7,793 employees (ACDED, 1999). Major employers in Washington County include the Washington County Board of Education (2,900 employees), Washington County Health Services (2,500 employees), State of Maryland (2,397 employees) and Citicorp Credit Services (2,390 employees). The largest trade industry in Washington County is also the services industry with 18,343 employees (HWCMEDC, 1999).

### 3.22 ENVIRONMENTAL JUSTICE AND THE PROTECTION OF CHILDREN

On February 11, 1994, President Clinton issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This order directs agencies to address environmental and human health conditions in minority and low-income communities in order to avoid the disproportionate placement of any adverse effects from Federal policies and actions on these populations. The general purposes of this Executive Order are to:

- Focus the attention of Federal agencies on human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice.
- To foster nondiscrimination in Federal programs that substantially affect human health or the environment.
- To give minority communities and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment.
- Consideration of environmental justice concerns includes race and ethnicity and the poverty status of populations. Table 3-10 depicts these characteristics for the population of Allegany and Washington Counties, as well as Maryland and the United States.

Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*, requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The order, dated April 21, 1997, further requires Federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. The order defines environmental health and safety risks as risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or

ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on, and the products we use or are exposed to).

**Table 3-10**  
**Race, Ethnicity, and Poverty Status for Allegany and Washington Counties, Maryland, and the United States**

	<b>Allegany County</b>	<b>Washington County</b>	<b>Maryland</b>	<b>United States</b>
White	96.85%	91.75%	68.91%	82.8%
Black	02.49%	7.14%	27.07%	12.6%
Hispanic	0.59%	1.03%	0.03%	N/A
Asian or Pacific Islander	0.57%	0.86%	3.71%	0.7%
American Indian, Eskimo, or Aleut	0.09%	0.25%	0.3%	0.9%
Living in Poverty	16.5% (1993)	10.6% (1993)	10.2% (1993)	13.8% (1995)

Note: County percentages for race and ethnicity based on 1996 data. Source: USDOC, 1998

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## **4.0 - EXISTING MANAGEMENT PROGRAMS**

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## **4.0 EXISTING MANAGEMENT PROGRAMS**

### **4.1 NATURAL RESOURCES MANAGEMENT**

The overall installation natural resources program, directed by the Site Manager at TBBTF, is described in this INRMP. It consists primarily of activities, detailed in Section 5 of this plan, for the management of the natural resource elements discussed in Section 3. Other programs that are integral to, or otherwise related to, natural resources management at TBBTF are discussed below.

### **4.2 LAND MANAGEMENT**

The Adjutant General (TAG) is directly responsible for the operation and maintenance of TBBTF, including implementation of the INRMP. TAG determines the type and number of units and training events to be conducted at TBBTF during the five-year period of the INRMP. TAG also ensures installation land users are aware of, and comply with, the provisions, procedures, requirements and applicable laws and regulations associated with implementation of the INRMP. The Site Manager has the responsibility for overall land management at TBBTF and is the representative of TAG with all the responsibilities assigned by TAG excluding coordination and scheduling of the reservation and its facilities. Scheduling of the reservation and facilities is coordinated through the MDARNG Department of Plans, Operations, and Training (DPOT).

The Site Manager has overall responsibility for the operation, maintenance, logistics and security support rendered by the installation. Duties of the Site Manager include:

- Implementation of policies and procedures required to provide maximum administrative and logistical support to organizations and individuals utilizing facilities of the training site.
- Brief commanders and individuals signing in for the use of the facility to insure that they are knowledgeable of standard operating procedures (SOP).
- Supervise all technicians, service-contract, site-contract, and state-paid employees engaged in the operational support missions at the training site.
- Insure users are complying with the provisions of the SOP and are not conducting activities or using facilities, equipment, etc., not specified in their approved request.
- Report all incidents immediately to the TBBTF Site Manager.
- Coordinate weekly with the State Facilities Sites Manager (MD-STAR-CPOT) regarding the scheduling and use of the training facility.
- Assure compliance with all environmental regulations, as established by Federal, state, and local agencies.



The Site Manager also ensures the goals and objectives for areas designated as improved and semi-improved grounds are implemented in a cost-effective manner. Typically these duties include soil erosion control, grounds maintenance (i.e., mowing and fertilizing), weed and brush control, and landscaping. The Site Manager also has the responsibility for managing the areas designated as unimproved lands. Duties inherent to unimproved lands include protection and management of federally listed threatened and endangered species, fish and wildlife management, supervision of outdoor recreation programs (i.e., camping), and maintaining the ecological integrity of the Sideling Hill Creek RUA and other sensitive habitats on TBBTF. The Site Manager has the primary responsibility for implementing the provisions of the INRMP on TBBTF.

### **4.3 INTEGRATED TRAINING AREA MANAGEMENT (ITAM)**

ARNG's Integrated Training Area Management (ITAM) program is designed to provide a management and decision-making process to integrate training and other mission requirements for land use with sound natural resources management. The goal is to achieve optimum sustainable use of training areas by inventorying and monitoring land conditions, integrating training requirements with land capacity, educating land users to minimize adverse effects, and providing for training land rehabilitation and maintenance. ITAM programs consist of four components:

- Land Condition Trend Analysis (LCTA)
- Land Rehabilitation and Maintenance (LRAM)
- Training Requirements Integration (TRI)
- Environmental Awareness

Baseline geographic information system (GIS) data including facility boundaries, buildings, wetlands, and endangered species have been compiled for TBBTF. GIS data will be applied to the ITAM program components and other natural resources initiatives where applicable to enhance the overall effectiveness of the programs and assist in the recording, tracking, and presenting of natural resource data at TBBTF.

Components of the ITAM program at TBBTF are discussed in the following sections. Conduct of specific ITAM projects at TBBTF are subject to funding constraints due to congressional appropriations, and funding. The ITAM program at TBBTF is managed by the MDARNG Environmental Program Manager.

#### **4.3.1 Land Condition Trend Analysis (LCTA)**

LCTA is the natural resources data collection and analysis component of the ITAM Program. LCTA consists of the inventory and monitoring of natural resources to document their condition and assess the ability of the land to withstand impacts from training. The intent of LCTA is to acquire essential natural resources baseline

information that is needed to effectively manage training lands. The primary objectives of LCTA are to evaluate land capability to meet multiple use demands on a sustained basis.

There are no established LCTA plots on TBBTF. Natural resources baseline information is based on the inventory and characterization of species and habitats conducted on TBBTF by the Maryland Natural Heritage and Wildlife Diversity Program (MDNHP, 1995). The DNR and TNC inventory and monitor harperella populations on Sideling Hill creek on an annual basis and DNR in cooperation with TNC has initiated a program to inventory, manage and monitor invasive plant species on the Boy Scout Barren. Inventory and monitoring prescribed in the INRMP includes monitoring of land conditions for areas where excessive erosion is occurring; monitoring of water quality; assessment and monitoring of aquatic habitats; inventory, characterization and monitoring of potential wetland and vernal pool habitats; inventory and monitoring of conditions at the Sideling Hill crossing for light infantry training; and inventory management and monitoring of invasive species on TBBTF (see Section 5). Results of monitoring will be used to determine if and where training or other activities are adversely affecting natural resources and should be modified or redirected to enable land conditions to stabilize or to be restored. Monitoring will also be used to determine where projects or activities need to be implemented to address land conditions or natural resources that have been impacted by training activities or natural events.

#### **4.3.2 Land Rehabilitation and Maintenance (LRAM)**

The LRAM component of ITAM develops land rehabilitation and maintenance projects, based on training requirements and priorities, to rehabilitate, repair, and maintain natural resources affected by training. LRAM makes use of best management practices, training area redesign and reconfiguration, and long-term maintenance planning.

TBBTF specializes in supporting training for light infantry combined arms operations. The primary types of training on the facility are in land navigation and mountaineering. Training activities are restricted in the RUA and in the 100-meter buffer to Sideling Hill Creek and use of live ammunition, cutting of vegetation, digging, and off road vehicle use is prohibited throughout the facility. Damage to training and natural areas associated with training activities is typically minor. LRAM projects are identified based on inventory and monitoring activities and are submitted on an as needed basis.

#### **4.3.3 Training Requirements Integration (TRI)**

The goal of TRI is the optimization of land use by integrating mission requirements with the carrying capacity of the land. TRI provides for analysis of existing land conditions on available land/space and baseline training requirements to determine training land carrying capacity. At present determination of training land carrying capacity is limited to subjective judgment based on observed training impacts and impacts from natural events.

#### **4.3.4 Environmental Awareness**

Environmental Awareness involves the education of officers and enlisted troops to foster wise use of the land. The Environmental Awareness component of ITAM improves understanding of the impacts of mission training and other activities on the environment. The Environmental Awareness component applies to tactical units, leaders, and soldiers using TBBTF, as well as other installation land users. Environmental Awareness is implemented by providing training and educational materials and by having the command emphasize the importance of environmental stewardship. Educational procedures and materials include briefings, posters, maps, and environmental regulations.

Advanced briefings are presented to training units and other users of TBBTF regarding environmental protection, land uses, and use restrictions at TBBTF. M-Day staff (Traditional Weekend National Guard Environmental Staff) are currently used to promote environmental awareness to training units at TBBTF. TBBTF is also developing fact sheets (guidelines) that address environmental issues and safety on the facility. The fact sheets will show the Restricted Use Area, 100-meter buffer to Sideling Hill Creek and Sensitive and Significant Habitats on TBBTF. Allowed uses and use restrictions will be presented in the fact sheets. The fact sheets will be posted at permanent locations including the Baker Building, adjacent to the parking area for Straus Lodge, and at other appropriate locations.

### **4.4 OUTDOOR RECREATION PROGRAMS**

#### **4.4.1 Military Mission Considerations**

The MDARNG has the responsibility to protect and enhance environmental quality, conserve natural resources, and provide opportunities for outdoor recreational activities at TBBTF. TBBTF was leased by the MDARNG solely for national defense purposes; therefore other uses such as recreational activities are secondary to mission needs.

Recreational use of TBBTF to the west of Sideling Hill Creek is by permit only. Reservations to use the facility must be made through the DPOT. Units of the MDARNG and units of the other services have priority of use over any non-military organizations or personnel. Use by non-military organizations or personnel are subject to change up to two weeks prior to the scheduled use.

#### **4.4.2 Public Access**

Army Regulation 200-3 states that installation commanders will provide for controlled recreational access at facilities that contain land and water areas suitable for recreational use and enjoyment by the public. Access is to be within manageable quotas, subject to safety, military security, threatened and endangered species restrictions, and the capability of the natural resources to support the recreational use.

TBBTF is a nonresidential installation and recreational use of the facility by the general public is limited. The presence of several sensitive habitats and associated rare, threatened and endangered plant species on the facility also limits the facilities availability for general use by the public. The primary user of TBBTF is the Boy Scouts of America. The Baltimore Area Council of the Boy Scouts of America owned and leased TBBTF to the MDARNG prior to their sale of the property to the State of Maryland. The Boy Scouts currently use the facility for camping, hiking, swimming, boating, fishing and other light recreational uses.

#### **4.4.3 Hunting and Fishing Programs**

There are no organized hunting or fishing programs on TBBTF. Hunting on the western side of Sideling Hill Creek within TBBTF is prohibited. Hunting on the eastern side of the creek is allowed in compliance with regulations and seasons established by the DNR. The boundary of the no hunting area is marked, but no perimeter fences limit access to the facility. Troops and boy scouts using TBBTF during hunting season are required to wear orange when moving around the facility. The DNR has complete responsibility for management of hunting on the eastern side of Sideling Hill Creek.

Fishing is allowed in Sideling Hill Creek in compliance with the regulations and seasons established by the DNR. Sideling Hill Creek is not stocked within the boundaries of TBBTF, but rainbow trout are stocked upstream of the facility in Green Ridge State Forest and in the Sideling Hill Wildlife Management Area. The stream is typically stocked with 8,000 adult rainbow trout on an annual basis. Fish commonly caught in the creek include rainbow trout, smallmouth bass, rock bass, and bluegill. Sideling Hill Creek is managed by the DNR as a Put-and Take Trout Fishing Area. Put-and-Take Trout Fishing Areas are closed to all fishing during designated periods. Sideling Hill Creek is closed to all fishing from March 5 to March 25 and from April 16 to April 22. During open fishing periods, there is a 5 trout per day creel limit with no restrictions on size, tackle, or types of bait used. The DNR Division of Freshwater Fisheries is responsible for management of fishing in Sideling Hill Creek.

Permitted users of TBBTF are also allowed to fish in the man-made water supply pond located adjacent to the Straus Lodge. The pond is not stocked and fishing on the pond is on a catch and release basis. Fish species caught in the pond typically include largemouth bass and bluegills. Fishing on the pond is managed by the Site Manager.

Harvest and population data for the pond and Sideling Hill Creek on TBBTF are not available.

#### **4.4.4 Safety and Security**

Hunting on the western side of Sideling Hill Creek on TBBTF is prohibited. The SOP for TBBTF prohibits personal weapons and/or ammunition on the facility. Live ammunition of any type is not utilized and is prohibited. The restriction on the possession of weapons or ammunition on the facility does not apply to the eastern side of Sideling Hill Creek where hunting is permitted during designated seasons.

The Site Manager is responsible for briefing commanders and individuals signing in for use of TBBTF to ensure their familiarity with the SOP and issues relating to safety. In addition to other safety requirements, troops, boy scouts, and other users of TBBTF are required to wear orange when moving around the facility during hunting seasons. Access to the pond is also restricted when it is frozen as a safety precaution.

#### **4.5 ENFORCEMENT**

Army Regulation 200-3 states that enforcement of laws primarily aimed at protecting natural resources and outdoor recreation activities are an integral part of the facilities natural resources management program. Fish and game laws must be implemented in accordance with applicable state and Federal laws and as approved by the commander in the INRMP.

Effective enforcement of laws and regulations applicable to natural resources enhances the overall natural resources program, protects natural and cultural resources and provides public safety by enforcing off-limit areas and by protecting against criminal destruction of natural resources. At TBBTF, the Site Manager checks personnel accessing the site to ensure that they are permitted for site use, conducts routine patrols, and has oversight of activities in training areas.

The DNR Police, Maryland State Police, and Hancock Sheriffs Department exercise law enforcement jurisdiction on TBBTF. Law enforcement services are utilized on an as needed basis when requested or approved by the Site Manager.

#### **4.6 ECOSYSTEM MANAGEMENT**

The Office of the Under Secretary of Defense for Environmental Security issued a memorandum to all forces in the DoD to implement Ecosystem Management on DoD lands. The memorandum, issued August 8, 1994, stated that ecosystem management would become the basis for future management of DoD lands and waters. Ecosystem management combines multiple use needs, provides a consistent framework to manage installations, and ensures that the integrity of DoD lands stays intact. This INRMP follows the direction set forth in the memorandum and the guidelines issued by the DoD are incorporated into the goals and objectives of the plan.

Specific approaches and guidelines identified by the DoD to implement the ecosystem management approach on military lands include: the maintenance and improvement of the sustainability and native biodiversity of ecosystems; administration with consideration of ecological units and time frames; the support of sustainable human activities; the development of a vision of ecosystem health; the development of priorities and the reconciliation of conflicts; the development of coordinated approaches to work toward ecosystem health; the use of the best science and data available; the use of benchmarks to monitor and evaluate results; the use of adaptive management; and implementation through installation plans and programs. These approaches and

guidelines are reflected in the management measures that have been developed in this INRMP.

The goal of ecosystem management on TBBTF is to ensure that the facility supports current and future training requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, this approach to management will maintain and improve the sustainability, integrity and biological diversity of the terrestrial, riparian and aquatic ecosystems on the facility while supporting human use and the environment required for realistic training operations.

The management measures and approaches developed and presented in Section 5 take into consideration the relationships between ecosystem components, the military mission, and other land uses. An adaptive management approach has been incorporated into the INRMP to allow for the adjustment of management measures and strategies based on improved knowledge and data and changing ecosystem dynamics. Monitoring has been incorporated into the INRMP to generate data necessary to determine where adaptive management approaches are required and to ensure that the prescribed management measures and approaches are effective in achieving their intended goals and objectives.

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## **5.0 - NATURAL RESOURCES MANAGEMENT**

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## **5.0 NATURAL RESOURCES MANAGEMENT**

This section begins with an overview of the general goals and objectives established by MDARNG for the management of the resources at TBBTF. Section 5.1 provides a description of the methods used to develop this INRMP and the management measures for each resource area. Resource-specific discussions, provided in Sections 5.3 through 5.14, provide detailed explanations of the goals and objectives, management strategies, and other management alternatives considered for each resource area. Resource-specific goals and objectives are provided, as well as the relationship of the resource in supporting the mission. The subsections entitled Management Measures describe the management measures selected to be implemented to meet the resource-specific goals and objectives. These subsections provide the rationale for why the management measures have been selected and their potential relationship to, or impact on, other natural and cultural resources and the military mission. Other management alternatives considered but rejected for reasons such as economical or ecological impracticality are presented as a subheading under each resource area. Section 5.15 provides a summary of the management measures, including inventorying and monitoring programs, for all resource areas, their relationship to each other and the military mission, and how they serve to achieve the goals and objectives of the natural resources management program at TBBTF. Table 5-1 provides a summary of management measures and monitoring for the Sideling Hill Creek crossing for light infantry training.

It is understood that in-house staff available for implementation of management measures prescribed in Section 5 are limited in number. It is therefore assumed that some of the professional work required by this plan will be accomplished by contract; through partnerships, including borrowed labor; with universities and other public research institutions; by volunteers; or by limited term or temporary employees.

### **5.1 METHODS**

The preparation of this INRMP involved the review and analysis of past natural resource management practices, ongoing programs, and the current conditions of the existing resources as detailed in Section 3. The review process included interviewing TBBTF personnel, as well as key individuals from state and Federal agencies (i.e., USFWS and DNR); collecting existing environmental documentation; and conducting field reconnaissance of the installation.

The findings from the interviews, field reconnaissance, and document review process have been synthesized and incorporated into this INRMP using the ecosystem management approach described in Section 4.6. Where data gaps exist, inventorying and monitoring programs have been prescribed. These programs are designed to collect the data necessary to fill the information gaps and to achieve the objectives of the natural resources program.

The approach used to develop the discussion of the management strategies for each resource followed three general steps:

- **Goals and Objectives.** The goals and objectives for the management of the resource, as well as the relationship of the resource to other components of the ecosystem (including the human component) and the military mission, were described.
- **Management Measures.** Past management strategies, current conditions, and an array of management strategies based on a more-informed knowledge of ecosystem management principles were evaluated and considered to develop management strategies that would achieve the goals and objectives for the resource, as well as those of the overall natural resources management program. An inventory of needs and monitoring programs necessary to generate data to ensure continued success of the program and to provide the information needed to facilitate the integration of adaptive management techniques was included.

Adaptive management is a continuing process of actions based on planning, monitoring, evaluation, and adjustment. The process allows managers to determine how well their actions meet objectives and what management steps are needed to increase the chances of achieving the objective.

- **Other Management Alternatives.** Other management alternatives were considered during the screening process, but eliminated because they were economically infeasible, ecologically unsound, or incompatible with the requirements of the military mission. A discussion of these alternatives are included following the management measures for each of the resource areas.

## **5.2 GOALS AND OBJECTIVES OF THE NATURAL RESOURCES MANAGEMENT PROGRAM**

The overall goal established by TBBTF for the natural resources management program is to maintain ecosystem viability and ensure the sustainability of desired military training area conditions. The TBBTF Command has identified a number of objectives that are necessary to achieve these goals:

- Carry out a natural resources management program that reflects the principles of ecosystem management.
- Use adaptive management techniques to provide the flexibility to adapt management strategies based on increased knowledge and data gained from monitoring programs and science literature.
- Seek to maintain or increase the level of biodiversity of native species.
- Protect forest resources from unacceptable damage and degradation resulting from insects and disease, animal damage, invasive species, and wildfire, and manage the resources in a manner that supports the military mission.
- Prevent the degradation of water quality, protect aquatic and riparian habitats, and identify and restore degraded habitats.

- Protect soil resources from erosion and destabilization through prevention and restoration efforts.
- Protect and preserve cultural resources in accordance with state and Federal laws.
- Provide special protection and management that leads to the recovery of threatened and endangered species and protects species of special concern.
- Protect rare and unique plant species identified as state or locally rare, but without legal protection status, to the extent practical without undue restrictions on operations.
- Protect the sensitive and ecologically significant habitats located in the Sensitive and Significant Habitat sites on TBBTF.
- Provide outdoor recreational opportunities that avoid conflict with the military mission.
- Provide a positive contribution to the community by offering informative and educational instruction and opportunities.

Implementation of the management measures for the various resources contained in the INRMP will ensure that TBBTF successfully achieves these goals.

The following sections present general and specific management measures for the resource areas on TBBTF.

### **5.3 SOIL MANAGEMENT**

The primary goals of soil conservation and management on TBBTF are to protect soil resources, and prevent soil erosion and its potential impacts on water quality, habitat, and mission objectives. Over half of the soil mapping units that occur on the installation are considered to be moderately to severely susceptible to erosion (see Table 3-3). The prevalence of steep to very steep slopes over the facility compounds the potential for the development of excessive erosion in areas where soils are disturbed. Most problems associated with soil erosion on the facility occur in areas where vegetation has been removed or disturbed on steep slopes.

Objectives of the soil conservation and management on TBBTF are to avoid disturbance of soils that are considered to be moderately or severely susceptible to erosion. Where these areas are disturbed, either as a result of anthropogenic activities or due to natural causes, they are stabilized and repaired in a timely manner to avoid the development of excessive erosion areas. Installation sources of erosion and sedimentation, runoff, and dust will also be controlled to prevent damage to land, water resources, equipment, and facilities on both the facility and adjacent properties.

### **5.3.1 Management Measures**

Soil erosion on TBBTF is a problem in localized areas along unpaved roads, drainageways, and where land disturbance has occurred. Many of the current or planned projects at TBBTF are designed to address problems resulting from erosion due to land disturbance. Due to the potential for erosion in disturbed areas, it is necessary that a comprehensive soil resource management approach be followed. The current policy of addressing problem erosion areas as they occur will be continued. In addition, a management approach designed to avoid the disturbance of potential problem erosion areas will be developed, when possible, in a manner consistent with mission objectives.

TBBTF will implement the following general and specific soil conservation measures:

- Initiate a soil erosion program to establish baseline conditions and to determine where erosion and associated sedimentation are occurring. Use the results of monitoring to determine locations where management practices should be implemented to rehabilitate affected resources.
- Repair roads where they are heavily eroded, and implement best management practices where necessary to minimize future erosion and associated sedimentation.
- Place large rocks in the ditch along the access road, where needed, from the Lookout Site to the Administration House to disperse runoff flow on steep slopes and reduce the potential for downcutting, severe erosion and resultant downstream water quality impacts.
- Restrict the use of the road from Tabler Lodge to Sideling Hill Creek during and immediately following heavy rain, to minimize the potential for erosion and sedimentation and potential resultant water quality impacts to Sideling Hill Creek.
- Place gravel in the established roadway, parking sites, and along access paths at the mountaineering rappelling site to reduce potential for the development of erosion problems in the area. Border the established access road and parking sites with railroad ties to keep vehicles within designated areas. Install a gate to limit access. Reestablish understory vegetation in the area, where possible, with native vegetation.
- At the Potomac Overlook amend soils and establish native understory vegetation, where possible, to reduce the potential for erosion in the area.
- Monitor the facility road system on a regular basis to ensure that washouts are identified in a timely manner to minimize potential damage from erosion and resultant deposition of sediments.
- Limit traffic in vegetated areas, especially where the vegetation is crucial to stabilizing soils from erosion.
- When the exposure of soils is necessary to accomplish mission objectives, whether for military training or for other activities, use soil conservation measures (e.g., check

dams, silt fences, diversions) to control erosion, sedimentation, and dust. To limit land maintenance expenditures and minimize environmental impacts, site physically intensive land-disturbing activities, when possible, on the least erodible lands (those requiring the least cover for erosion control). The potential erodibility of a site (as determined from existing soil types, slopes, and vegetative cover) and the location of adjacent wetlands, or other surface waters, will be identified and considered in order to minimize impacts on these resources. Implement erosion and sediment controls where appropriate. Maintain protective vegetative cover over all compatible areas, especially on steep slopes. Other materials, such as gravel, fabrics, mulch, riprap, or other materials that are environmentally safe and compatible with the location, may be used, as appropriate, for control of erosion in problem areas.

- Monitor soil erosion on a regular basis, especially following damaging events such as heavy rains, high winds, or excess trafficking (training operations). Monitoring of potential erosion areas will allow early detection of problem areas.
- Based on the results of monitoring, rehabilitate vegetation and soils in areas where they have been impacted by training or other activities in a timely manner to reduce the potential for the development of excessive erosion or sedimentation sites.
- Conduct an evaluation of the TBBTF road system with the objective of establishing a system that meets installation needs, is cost-effective to maintain, and contributes the least amount of erosion possible. Roads will be evaluated as to their location with regard to environmental damage, especially erosion. The road evaluation project will result in a list of roads to be repaired, restricted for use, or closed.
- The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of soil management practices that require terrain alteration. Soil management and conservation activities that result in terrain modification for erosion control or other management objectives must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with soil management activities may be generated under the National Historic Preservation Act (NHPA), NEPA, the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA) and Executive Order 13007 (see Section 5.10).

### **5.3.2 Other Management Measures Considered**

Intensive management measures have been proposed for the soil resources on TBBTF. Other soil management alternatives that represented a program consisting of fewer and less intensive management measures were considered, but rejected. The other management alternatives considered represented the minimum approach to achieving a soil resource management program that could comply with the guidelines established in AR 200-3.

The management alternatives in this approach were aimed at controlling the level of erosion, soil loss, and disturbance that could potentially occur, rather than taking the steps necessary to prevent, to the maximum extent practicable, the likelihood of these events occurring. Given the nature of the soils on the reservation and their vulnerability to erosion, this minimal approach to soil management has been rejected. The military mission requires continuous vegetative cover, and the ability to sustain this cover over the long term could be jeopardized by a minimal management approach and unexpected climatological events. The effort and resources necessary to implement a more intensive approach is a prudent investment toward ensuring the long-term sustainability of soil resources.

## **5.4 WATER RESOURCES MANAGEMENT**

The ecological and human health importance of maintaining healthy water bodies at TBBTF is reinforced by several Federal and state laws and regulations. The Federal Clean Water Act provides the statutory basis for the Maryland Water Quality Standards Program. The Maryland Department of the Environment is responsible for administration of the Maryland Water Quality Standards. In addition, AR 200-1 and AR 200-3 also promote the importance of maintaining healthy water body systems on the installation.

The primary goal of water resources management at TBBTF is to protect the water bodies on the installation. The objectives defined for meeting this goal are as follows:

- Protect aquatic and riparian habitats.
- Prevent degradation of water quality.
- Identify and restore degraded aquatic habitats.

### **5.4.1 Management Measures**

The management measures that will be implemented to protect the water resources on TBBTF include:

- Conduct routine (semi-annual) water quality sampling/monitoring (metals, nickel, lead, and Total Suspended Solids) on Sideling Hill Creek where it flows onto TBBTF and upstream of the boundary where it flows off of the facility. This will help to prevent potential degradation of water quality on TBBTF from going unnoticed. Frequent water quality monitoring provides a mechanism for the early detection of potential problems and makes it easier to identify the source/cause of the degradation. The data also provides the foundation from which to make future management decisions.
- Conduct water sampling and analysis as necessary if visual or olfactory indicators of water quality degradation are observed. This will enable early detection of potential water quality problems and make it easier to identify the source/cause of the degradation. If it is determined that water quality degradation is/has occurred,



implement best management practices appropriate to mitigate the problem in a timely manner.

- Conduct routine (annual) screening level watershed assessments on TBBTF to evaluate the potential for adverse impacts to water bodies both on and off of the facility. The assessments will evaluate surrounding land uses and identify potential sources of point and nonpoint source pollutant loadings to water bodies on TBBTF.
- Based on the results of the screening level watershed assessments, identify potential sources of pollutant loadings to water bodies on TBBTF and identify and prioritize management measures to minimize adverse impacts to water quality and aquatic habitats.
- Remove the trash (appliances, bicycles, etc.) from Sideling Hill Creek located just upstream of the Boy Scout Barren.
- Monitor water bodies on TBBTF on a regular basis for illegal dumping. If dump areas or accumulations of litter are discovered remove the trash and dispose of it properly to reduce the potential for adverse impacts to water quality and habitats.
- Place large rocks in the ditch along the access road, where needed, from the Lookout Site to the Administration House to disperse runoff flow on steep slopes and reduce the potential for down cutting, blowouts, severe erosion and resultant downstream water quality impacts (see Section 5.3.1).
- Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the RUA established in the lease agreement between MDARNG and DNR (see Figure 2-1).
- Continue to prohibit the cutting or clearing of vegetation within the 100-meter buffer to Sideling Hill Creek and the RUA.
- Limit use of herbicides for exotic invasive plant species control in areas adjacent to water bodies on TBBTF. Where it is determined that use of herbicide is the only viable approach for control of invasive plants, application should be made by personnel trained in their proper use. Minimum offsets of 30 feet should be maintained from water bodies for use of herbicides and application should be directed specifically at target species. Herbicides used in areas adjacent to water bodies should be limited to those that do not migrate in the soil and that do not persist for an extended time after application (i.e., glyphosate).
- Turf management chemicals for TBBTF landscape maintenance will be applied minimally, only when specific problems are identified, and in conformance with appropriate standards. Turf management chemicals will not be applied in areas immediately adjacent to the man-made pond. Due to slopes adjacent to the pond, a 100-foot buffer restricting the use of turf management chemicals should be maintained around the pond. No turf management chemicals will be applied within the 100-meter buffer on Sideling Hill Creek or the RUA.

- Pesticides and fertilizers will be applied in conformance with appropriate standards, and should not be used within 100 feet of the water supply pond, tributaries to Sideling Hill Creek, or within the 100-foot buffer to Sideling Hill Creek or the RUA.
- Offsets from drainageways and intermittent streams on TBBTF that originate or flow through activity areas, or along roadways, will be maintained (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek, or downstream waterways, resulting from accidental fuel or chemical spills.
- Pollution prevention will be practiced when vehicles are on facility roads.

#### **5.4.2 Other Management Measures Considered**

A less intensive approach to water resource management was considered, but rejected. The less intensive approach did not include semi-annual water quality monitoring or the implementation of best management practices to control or prevent nonpoint sources of pollution (e.g., turf chemical applications) from entering the waterbodies. This alternative was rejected because water quality sampling is necessary to determine whether the waterbodies on the facility represent an ecological or human health hazard. Routine sampling will provide the data for the early detection of potential water quality problems and implementing best management practices to prevent nonpoint source pollution will prevent or minimize potential water quality problems.

### **5.5 HABITAT MANAGEMENT**

#### **5.5.1 Wetlands**

Wetlands are of critical importance to the protection and maintenance of living resources since they provide essential breeding, spawning, nesting, and wintering habitats for many fish and wildlife species. Wetlands also enhance the quality of surface waters by impeding the erosive forces of moving water and trapping waterborne sediment and associated pollutants, maintaining baseflow to surface waters through the gradual release of stored floodwaters and groundwater, and providing a natural means of flood control and storm damage protection through the absorption and storage of water during high-runoff periods.

DoD natural resources policy states that wetlands will be protected. All activities that affect wetlands require an environmental analysis in accordance with AR 200-2, AR 200-3, and applicable Federal and state laws and regulations. USACE permits are required under Section 10 of the Rivers and Harbors Act of 1899 prior to commencing any work or building any structures in navigable waters of the United States. Also, USACE permits are required under Section 404 of the Clean Water Act for the discharge of dredge or fill material into waters of the United States, including wetlands. The regulations established in Title 33 of the *Code of Federal Regulations* (CFR), Parts 320-330, prescribe the statutory authorities and general and special policies and procedures

applicable to the review of applications for USACE permits. Before commencing any new work in waters of the United States, a district engineer must be contacted and a permit obtained, as appropriate (HQDA, 1995).

Wetlands in Maryland are also offered protection through state regulations (Maryland Nontidal Wetland Protection Act of 1989), which require strict regulatory review. A 25-foot habitat buffer is required around all state nontidal wetlands, and a 100-foot buffer is required around wetlands of special state concern. Additional protection for wetlands in Maryland is provided through the 401 Water Quality Certification Program. Activities involving discharges into waters of the United States, including wetlands, are required to be consistent with state water quality standards.

Executive Order 11990 requires Federal agencies to minimize any significant action that contributes to the loss or degradation of wetlands and that action be initiated to enhance their natural value. DoD policy is to avoid adverse impacts to aquatic resources and offset adverse impacts that are unavoidable. Additionally, DoD will strive to achieve a goal of no net loss of values and functions of existing wetlands and will permit no overall net loss of wetlands on Army-controlled lands.

The main goal of the TBBTF wetland management approach is to avoid adverse impacts to the habitats and to continue to implement a program that is consistent with DoD natural resources policy. A wetland management policy with the objective of maintaining no net loss of wetland habitat will be continued on TBBTF. Activities occurring in, or adjacent to, wetlands that could result in negative impacts to the habitats will be avoided, when possible, in a manner consistent with mission objectives. Where impacts to wetlands are not avoidable, mitigation of the impacts will be implemented. In a manner consistent with Executive Order 11990, wetland management objectives at TBBTF will take a progressive approach toward protecting existing wetlands on the facility.

A reconnaissance level inventory of wetlands occurring on TBBTF was conducted in March and May of 2000. Figure 3-4 shows the locations and approximate extent of wetlands identified during the survey. The extent of riverine wetlands occurring in Sideling Hill Creek is not shown in Figure 3-4. Non-persistent emergent riverine wetlands occur at several locations in Sideling Hill Creek. Their locations and extent may change over time based on prevailing weather conditions and stream dynamics.

A planning level wetland delineation was conducted by the U.S. Army Engineer Research and Development Center Waterways Experiment Station on TBBTF on September 23, 1999. No jurisdictional wetlands were identified on the facility. The study stated that caution should be taken within a 100-foot buffer on either side of the streams on TBBTF for the presence of jurisdictional areas including seasonal and perennial wetlands, intermittent and perennial tributaries and ponds (USAERDC, 2000). Potential wetlands identified in the reconnaissance level assessment conducted on March 29 and May 18 and 19 of 2000 include seasonal and perennial wetlands described in the planning level wetland delineation conducted on September 23, 1999.

### **5.5.1.1 Management Measures**

All wetlands, except the wetland occurring in the drainage area along Ziegler Road, are located within the RUA and 100-meter buffer to Sideling Hill Creek. The wetlands located adjacent to Sideling Hill Creek are protected by existing use restrictions. Preventing or minimizing disturbance of habitat in and around these wetlands will help maintain their functions. These wetlands will also benefit from management that calls for limited exercises and that prohibits development at or adjacent to the sites.

TBBTF will implement (or continue to implement) the following wetland conservation provisions:

- Develop a wetland inventory and assessment database by compiling additional information on the wetlands identified in the reconnaissance study. The geologic, hydrologic, and biological characteristics of the identified wetlands will be recorded. Important characteristics to be recorded include wet and dry periods, additional information on soils and major plant communities and composition, observed wildlife species, and periods of use by wildlife. The goal of this management measure is to develop a database that will enable management and use decisions to be made in a manner that will minimize potential impacts to wetland habitats on TBBTF. The database will be used to track wetland conditions on TBBTF and to assist in the identification of potential problem areas.
- Maintain a minimum of a 30-meter buffer around wetlands. Limit activities within buffer zones to those that would cause little or no impact on, or disturbance to, the wetlands. The locations of most of the wetlands identified on TBBTF are within the Sideling Hill Creek 100-meter buffer zone (see Figure 2-1) so additional buffer requirements should not be necessary.
- Plan training exercises to avoid wetland impacts to the maximum extent possible and mitigate unavoidable impacts on wetland functions.
- Review operations and maintenance programs that potentially affect wetlands, and develop procedures and guidelines to avoid the loss of wetland functions.
- Evaluate general vegetative characteristics of wetlands to determine where potential future control of invasive species could result in measurable habitat value enhancement.

### **5.5.1.2 Other Management Measures Considered**

The management measures described above provide the maximum amount of protection for wetlands without impeding the military mission. Other management alternatives that were considered but rejected were less comprehensive and, therefore, offered less protection for these sensitive and federally protected ecosystems. These less intensive management alternatives did not include establishing buffer zones or developing a wetlands database. These less intensive alternatives offered the level of protection

necessary to maintain the wetlands at their current status, but did not offer ways to improve and enhance their ecological integrity and protect the biological communities inhabiting them. For example, establishing buffer zones will ensure adequate long-term protection by decreasing the likelihood of future adverse impacts. In addition, increasing the amount of information that is known about the wetlands on TBBTF will provide the necessary data to properly monitor the systems. Developing the database will allow natural resources managers to track the success of the management practices and to adapt future management practices as needed. The more comprehensive management measures will ensure the long-term ecological viability of these sensitive ecosystems.

A more intensive management alternative was also considered. This alternative restricted all activity around the identified wetlands. Given the level of protection provided to the wetlands by existing land use restrictions, this alternative was considered to be too restrictive and incompatible with the mission and, therefore, was dismissed.

### **5.5.2 Vernal Pools**

In Maryland, a vernal pool is defined as a nontidal wetland in a confined depression that has surface water at least two consecutive months during the growing season, is free of adult fish populations, provides habitat for amphibians, lacks abundant herbaceous vegetation, and is considered an area of significant plant and wildlife value. Vernal pools are offered protection through state regulations (Maryland Nontidal Wetland Protection Act of 1989), and require the strictest regulatory review. In addition, a 25-foot habitat buffer is also required around vernal pools (and all state nontidal wetlands), and a 100-foot buffer is required around wetlands of special state concern, including some vernal pools.

Vernal pools are of critical importance to the protection and maintenance of living resources, because they provide essential breeding, spawning, nesting and wintering habitats for a wide range of species. Vernal pools provide a critical element in the life cycle of certain amphibians and invertebrates because they typically cycle annually from flooded to dry and are therefore void of fish that eat their eggs or larvae. Several species of wildlife, including some that have evolved breeding strategies that are intolerant of predation on their eggs and larvae, are totally dependent on vernal pools for their survival.

Vernal pools are especially vulnerable to human disturbance because their size and ephemeral nature makes them hard to recognize during much of the year. Vernal pools were identified in the Maryland Natural Heritage and Wildlife Diversity Program (1995) inventory of rare, threatened, and endangered species and sensitive habitats on TBBTF (MDNHP, 1995). The vernal pools were identified in the abandoned wet pasture section of the Lower Sideling Hill Creek floodplain downstream of the Ziegler Road Bridge. The vernal pools are located within the areas designated as wetlands in the reconnaissance study conducted in March and May of 2000. Management measures to protect vernal pools on TBBTF will involve efforts to identify and document the pools so that conditions and trends in the habitats can be monitored and proper protection can be afforded through the ongoing natural resources management program. Limiting activities

that occur in the immediate vicinity of vernal pools will also be an objective of their management on TBBTF.

#### **5.5.2.1 Management Measures**

The following management measures for vernal pools will be implemented at TBBTF:

- Identify and document the location of vernal pools in the abandoned wet pasture below Ziegler Road Bridge. Vernal pools will be identified based on criteria established by the State of Maryland.
- Record the geologic, hydrologic, and biological characteristics of the inventoried vernal pools. Important characteristics to be recorded include wet and dry periods, major plant communities (if any) and composition, observed wildlife species, and periods of use by wildlife.
- Maintain 30-meter buffers around inventoried vernal pool habitats. The locations of known vernal pools on TBBTF are included in the areas designated as wetlands and are within the Sideling Hill Creek 100-meter buffer zone (see Figure 2-1) so additional buffer requirements should not be necessary. Activities within the buffer zone should be restricted to those that would cause little or no disturbance to the vernal pools, especially during wet periods.

#### **5.5.2.2 Other Management Measures Considered**

The management measures presented for vernal pools provide a comprehensive approach to protecting the habitats on TBBTF. Other management alternatives that were considered, but rejected, were less comprehensive and provided less protection for the sensitive ecosystems. The less intensive approach did not include documentation of the characteristics of the vernal pools on TBBTF. The less intensive alternative offered the level of protection necessary to maintain the vernal pools at their current status, but did not provide mechanisms to improve and enhance their ecological integrity and protect the biological communities inhabiting them. For example, establishing buffer zones and maintaining existing buffers will ensure adequate long-term protection by decreasing the likelihood of future adverse impacts. In addition, increasing the amount of information that is known about the vernal pools on TBBTF will provide the necessary data to properly manage the ecosystems. Developing a database of the characteristics and conditions within vernal pools on TBBTF will enable management approaches to be adapted as necessary to ensure the long-term viability of these sensitive habitats.

#### **5.5.3 Riparian Habitats**

The primary goal of riparian area management on TBBTF is to protect habitats within the riparian area and in Sideling Hill Creek and its tributaries. Protection and management of the riparian zone will ensure the integrity and continued existence of the riparian habitats; protect sensitive habitats and species within the riparian areas; and ensure that the

riparian habitats will continue to function to help maintain water quality and habitat within Sideling Hill Creek and its tributaries. Riparian areas on TBBTF are critical for helping to maintain normal stream flows, dissipating energy during high flow events, providing flood control, providing erosion control by stabilizing streambanks, providing fish and wildlife habitat, water quality improvement, groundwater recharge and discharge, and food chain support.

### **5.5.3.1 Management Measures**

The following management measures have been developed to ensure the continued protection of riparian areas on TBBTF and the associated sensitive habitats within and adjacent to them. Management measures are primarily designed to ensure that adequate riparian buffers are maintained and to limit activities within the buffers that may have adverse effects on the riparian area or adjacent stream habitats.

TBBTF will implement the following specific and general management measures for the maintenance and protection of riparian habitats on the facility:

- Continue to restrict general access to, and use of, the 100-meter buffer area on both banks of Sideling Hill Creek (see Figure 2-1 and Section 5.5.5.1 for 100-meter buffer to Sideling Hill Creek use restrictions).
- Continue to limit access and use of the RUA established in the lease agreement between MDARNG and DNR (see Figure 2-1 and Section 5.5.5.1 for RUA use restrictions).
- Inventory the stream crossing for light infantry training on Sideling Hill Creek to determine the current extent of microstegium in the area. Data gathered in the 1996 inventory conducted by the USGS should be used, where possible, to determine recent historic presence of microstegium at the stream crossing. These data can be compared with the current inventory to determine recent spread of microstegium. Mechanically remove microstegium from the stream crossing area and in an area 50-meters upstream and downstream of the crossing on both banks of Sideling Hill Creek. The microstegium should be mechanically removed after it has flowered, but before its seeds become viable (August to October) to ensure that new seed stock associated with plant removal is not supplied to the soil. Removal of the microstegium will be conducted under the supervision of a botanist to ensure that sensitive or protected plant species that may be present within or adjacent to the microstegium populations are not adversely impacted.
- Use a bush hog or weedeater to manage microstegium occurring on the roadway approach to Sideling Hill Creek on both sides of the stream crossing for light infantry training. Mowing will be conducted after the microstegium has flowered, but before its seeds become viable. Mowing will be required on a yearly basis for up to seven years due to the long seed bank viability of microstegium. Remove pioneer plants in the adjacent woods and those occurring in the creek bed by hand. Yearly monitoring of microstegium in, and adjacent to, the roadway will be conducted to determine if



mowing effectively contains the spread, or over time reduces the extent, of the species. If it is determined that mowing does not effectively control microstegium in the roadway at the crossing, management will be adapted and other methods for controlling the species will be evaluated and implemented for control. Continued yearly monitoring will be used to evaluate the success of the control efforts and determine if further modifications are necessary.

- Monitor the approach to the stream crossing on both sides of Sideling Hill Creek to determine if using the crossing is resulting in the spread of microstegium along and adjacent to the training trails. Any spread of microstegium associated with the stream crossing will be addressed in a timely manner to ensure that spread of the species is minimized. Mechanical removal of the grass should be conducted after the plant has set flower but before the seeds become viable. Monitoring of the stream crossing and adjacent area should be conducted several times throughout the growing season so that any new spread of the species associated with the use of the stream crossing will be detected. Continue to mechanically remove microstegium from the stream crossing area and in the area 150 feet along and inland from the streambank upstream and downstream of the crossing along with any new spread of the grass associated with use of the crossing on an annual basis. Continue to monitor the stream crossing and adjacent areas for the spread of microstegium several times throughout the growing season on an annual basis.
- Hand pull garlic mustard occurring at the Sideling Hill Creek crossing for light infantry training and in the area 150 feet along and inland from the streambank upstream and downstream from the crossing. Monitor the area on an annual basis for the reoccurrence of garlic mustard and to determine if use of the crossing is resulting in the spread of garlic mustard. Hand pull garlic mustard occurring in the area on an annual basis. Removal of garlic mustard from the crossing area should be conducted in May-June. Plants that are pulled after flowering has occurred should be bagged and removed from the site.
- Mechanically remove yellow day lily from the floodplain areas 150 feet upstream and downstream of the Sideling Hill Creek crossing for light infantry. Pitchforks or other similar tools should be used for removal to ensure the bulbs of the day lily are also removed. Plants should be bagged and removed from the site following their removal. Monitor the area on an annual basis for the occurrence of yellow day lily and remove plants that reoccur.
- Remove bush honeysuckle on the west side of Sideling Hill Creek along the road approaching the crossing for light infantry. A well-established population of bush honeysuckle occurs in an approximately one acre area along the road. Assess the extent of the bush honeysuckle population and direct initial efforts for removal on plants occurring in the woods around the perimeter of the main population. Mechanical methods should be implemented for removal of bush honeysuckle from the area. Monitor on an annual basis to determine the success of management and remove any plants that become reestablished in the area. Monitoring should be

conducted in early spring because early leaf out of the plant makes its identification easier at this time of year.

- Limit the use of the Sideling Hill Creek crossing to light infantry foot traffic during training activities. No vehicles or machinery will use the Sideling Hill Creek crossing for transportation or for any other reason except for in response to actual emergencies.
- Monitor and maintain the stream crossing for light infantry to ensure that streambank erosion and associated water quality and aquatic habitat impacts do not occur as a result of using the crossing. Apply environmentally compatible best management practices, if necessary, to minimize streambank, water quality, and aquatic habitat degradation at the crossing.
- Prohibit chemicals and fertilizer application in the mowed riparian area adjacent to the Ziegler Road Tributary to Sideling Hill Creek.
- Remove trash from the riparian area along Ziegler Road, where it runs adjacent to the intermittent tributary to Sideling Hill Creek, on a regular, as needed, basis to prevent it from entering the water body and impacting water quality and habitat in the tributary and in Sideling Hill Creek.
- Maintain wooded riparian areas along the intermittent streams on TBBTF that flow into Sideling Hill Creek. Limit activities in the riparian areas adjacent to the intermittent streams to those that will cause minimal, or no impacts to riparian vegetation or streambanks.

### **5.5.3.2 Other Management Measures Considered**

Additional management measures that were considered for the management and protection of riparian areas on TBBTF, but that are no longer being considered, include conducting a riparian habitat assessment and restricting all access to the riparian areas on TBBTF. Habitats and species occurring within and adjacent to the riparian zones on TBBTF were inventoried and characterized in the Maryland Natural Heritage and Wildlife Diversity Program *1995 Survey of Rare Threatened and Endangered Species and Significant Habitats on the Lil Aaron Straus Wilderness Area* (MDNHP, 1995). Information included in the survey provides the basis for the development of riparian area management measures on TBBTF.

Restricting all access to riparian zones on TBBTF was considered to protect the integrity of the habitats and species occurring along and adjacent to Sideling Hill Creek. Restricting all access to the riparian zone is no longer being considered because of the conflict it presents to maintaining the military mission on TBBTF. Access and use of the riparian area associated with the Sideling Hill Creek crossing will be allowed for light infantry foot traffic associated with training. The stream crossing is necessary to enable training to be conducted under realistic conditions. Access and use restrictions associated

with areas inside the 100-meter buffer zone and the RUA apply to the remainder of the riparian area along Sideling Hill Creek.

#### **5.5.4 Aquatic Habitats**

The goal of aquatic habitat management on TBBTF is to maintain healthy aquatic ecosystems, water quality, and fisheries resources on the facility. To achieve this, activities will be directed towards the maintenance of healthy ecosystems and the restoration of degraded systems. Sideling Hill Creek, which flows for a distance of more than two miles on TBBTF, is the most significant surface water feature on the training facility. Wetlands and vernal pools occur along Sideling Hill Creek associated with its floodplains. Several small unnamed intermittent streams flow into Sideling Hill Creek on TBBTF. Two intermittent streams flow into Sideling Hill Creek from the western side of the training facility and three flow in from the eastern side. All streams on the eastern section of the facility have their headwaters on Sideling Hill. There is also a small man-made pond located in the south central section of TBBTF in the field adjacent to Straus Lodge that was excavated to provide a source of water for fire control. These ecosystems provide support to the military mission and afford recreational opportunities at the installation. Habitat protection is the primary objective for maintaining healthy aquatic ecosystems and protecting the balance of physical, chemical, and biological characteristics within the water bodies.

General aquatic habitat management measures have been developed based on the goals and objectives for maintaining healthy aquatic ecosystems. The general management measures are primarily aimed at protecting aquatic habitats. Specific management measures will be developed based on the results of aquatic habitat and watershed assessments/evaluations. General management measures for aquatic habitats on TBBTF are presented below.

##### **5.5.4.1 Management Measures**

TBBTF will implement the following aquatic habitat management measures:

- Conduct physical habitat assessments to evaluate the integrity and conditions of stream reaches, instream habitat, and riparian areas along Sideling Hill Creek and its tributaries on TBBTF. Screening level assessments can be used to evaluate overall conditions, prioritize restoration projects (if any), and allocate resources.
- Based on the results of the habitat assessment, identify and prioritize reaches in need of restoration efforts (if any).
- Maintain aquatic species diversity by preserving natural systems both in and adjacent to water bodies on TBBTF. At TBBTF these natural systems include wetlands, riparian areas, and the sensitive and significant habitats located in or adjacent to the water bodies. Implementing use restrictions in the 100-meter buffer zone and RUA will help to ensure that natural systems along Sideling Hill Creek are preserved. Additional management measures prescribed in Sections 5.4.1, 5.5.3.1, 5.6.1, and

5.13.1 will further help to ensure that natural systems are preserved in and adjacent to Sideling Hill Creek. Tributaries to Sideling Hill Creek outside of the 100-meter buffer zone and RUA, in particular, the tributary adjacent to Ziegler Road, will be assessed to determine the potential for preserving or enhancing natural conditions in and adjacent to the stream.

#### **5.5.4.2 Other Management Measures Considered**

Restricting all access to water bodies on TBBTF was considered as a method for improving aquatic habitat on the facility. Complete access restriction is no longer being considered as a viable management alternative because it would conflict with the military mission and the ability to provide water based outdoor recreation on TBBTF.

#### **5.5.5 Terrestrial Habitats**

The primary goal of terrestrial habitat management on TBBTF is to maintain the biodiversity of the native fauna and flora that occur on the facility while ensuring the successful accomplishment of the military mission. Biodiversity conservation contributes to overall ecosystem integrity and sustainability, which in turn supports the military mission. Maintaining species biodiversity helps to reduce the impacts of drastic changes in environmental conditions (e.g., fire, floods, drought, etc.) and reduces the effects of human use of an area.

Maintaining the edge between habitat types and their associated plant communities or the successional stages between plant communities within a habitat is important for maintaining the diversity of wildlife within an ecosystem. The diversity of wildlife in the edge or successional habitats is typically higher than in surrounding areas. Many birds are attracted to edge habitats because of the greater structural diversity found there, while some big game species' preference for edge habitat is probably due to the close association of cover and foraging areas. There is an abundance of edge or transitional habitats on TBBTF due to the diversity of habitats and contrasts between them (e.g., shale barren and floodplain habitats). Current Standard Operating Procedures for training activities such as restrictions on the use of vehicles off of designated roads, prohibitions on ground excavation or the cutting of vegetation, restricting instream crossing of Sideling Hill Creek to a designated location, and restricting activities in designated sensitive areas are some examples of approaches to accomplishing the military mission on TBBTF that is consistent with maintaining the viability of edge habitats and species diversity on the facility.

Maintaining snags (dead and dying trees) and trees with natural cavities is another important management approach useful in helping to maintain and enhance the diversity of wildlife on TBBTF. Snags and coarse woody debris on the ground serve several important ecological functions. They provide structural habitat characteristics for various plant and animal species, are important in long term nutrient cycling, and help to reduce the effects of erosion on soil and water resources. Snags and live trees with natural cavities are important habitat components for many wildlife species. Snags, with or

without cavities, provide foraging, nesting, roosting, and perching sites and the abundance of woodpeckers, raptors, passerines and bats can often be directly related to the number of snags and tree cavities in an area. In addition, raccoons and other small mammals use cavities in snags for over wintering sites, dens, food storage and as thermally regulated habitat.

Dead woody material on the ground, especially large logs, can also provide important habitat for many wildlife species. Many birds, including woodpeckers, eat insects that inhabit logs, and many other wildlife species use logs for breeding/nesting sites, foraging, and cover. Several species of amphibians are also found in association with decaying logs on the forest floor.

The use of regionally native plants for landscaping and in site maintenance (i.e. erosion control), when feasible and properly planned can result in healthier, longer-lived plantings that rely less on pesticides and fertilizers, minimize water use, require less maintenance and increase erosion control. Regionally native plants offer the advantages of natural adaptation to the climate and geologic environments. Use of regionally native plants also promotes regional identity, and enhances wildlife habitat and biodiversity.

Exotic invasive species can adversely effect the biodiversity of an area by killing off species (e.g., dieback of hemlocks associated with woolly hemlock adelgid infestations) or by crowding out native plants and establishing monocultures of invasive species (e.g., microstegium infestations along Sideling Hill Creek). Several exotic invasive plant species occur on TBBTF the most prevalent of which include microstegium, garlic mustard, and bush honeysuckles (*Lonicera* sp.). These species, along with other exotic invasive plants that occur on the facility, adversely affect the biodiversity of habitats and, in some cases, threaten rare species that occur on TBBTF. Exotic invasive species also effect the military mission by limiting the ability to train in natural conditions. Further discussion of exotic invasive species occurring on TBBTF can be found in Sections 3.15.6 and 5.13 and management measures established to address exotic invasives on TBBTF can be found in Section 5.13.

The following section presents general management practices and specific management measures that will be implemented to maintain, or improve, the diversity and condition of terrestrial habitats on TBBTF. Management measures specific to the sensitive and significant habitats on TBBTF are presented in Section 5.6.

#### **5.5.5.1 Management Measures**

The following management practices and specific management measures will be implemented at TBBTF for terrestrial habitats:

- Protect natural areas, especially sensitive and significant habitats (see Section 5.6). Continue to implement use restrictions designed to protect flora and fauna on TBBTF as established in the Lease Agreement and the SOP. Specific management measures established in the Lease Agreement include:

In the General Use Area (areas outside of the RUA and the 100-meter buffer to Sideling Hill Creek - see Figure 2-1): restrict use of motor vehicles to designated roads and parking areas; and no cutting or clearing of trees or other vegetation except as necessary for disease or invasive species control.

In the RUA (see Figure 2-1): no rappelling (except in the area approved for rappelling on the eastern end of Straus Barren); no use of motorized vehicles except as needed in emergencies; no construction of any kind; no training in areas containing shale barrens (except at the approved rappelling site) or threatened and endangered species; no overnight camping or camp fires; and no clearing or cutting of any trees or vegetation except as necessary for disease or invasive species control.

- Restrict access to, and use of, the 100-meter buffer on both sides of Sideling Hill Creek (see Figure 2-1). Training activities are minimized within the 100-meter buffer. See the riparian area management measures (Section 5.5.3) regarding access and use of the Sideling Hill Creek Crossing.
- Develop SOP fact sheets (guidelines) that address environmental issues and safety on TBBTF. The fact sheets will show the Restricted Use Area, 100-meter buffer to Sideling Hill Creek and Sensitive and Significant Habitats on TBBTF. Allowed uses and use restrictions will be presented in the fact sheets. The fact sheets will be posted at permanent locations including the Baker Building, adjacent to the parking area for Straus Lodge, and at other appropriate locations, if determined to be useful.
- Continue to require and conduct advanced briefing of training units regarding environmental protection, land uses, and use restrictions.
- Allow snags and dead trees to remain standing where they are not causing a threat to personal safety or structures on TBBTF. In particular, hollow butt trees and trees with holes in their bole for habitat will be left standing where they do not cause a safety threat.
- Snags and dead trees will be removed if they endanger personnel, roadways, power or phone lines, buildings, training structures, or if they interfere with landscape objectives.
- Maintain coarse woody debris and fallen logs on the forest floor where they do not pose a significant obstacle to training activities or are not a potential fire hazard.
- Where suitable conditions exist, and if it is cost effective and practical, TBBTF will use regionally native plant species in landscaping and maintenance projects. TBBTF will use non-invasive plant species in landscaping and maintenance projects wherever a native alternative is not possible.
- Evaluate the viability of establishing a wildlife meadow in the mowed area behind (east end) the Baker Building. Use someone knowledgeable and experienced in the establishment and maintenance of wildlife meadows in the local region to evaluate the potential for establishing the meadow. If it is determined that a wildlife meadow

can be established and maintained at this location, then implement the action of planting the meadow. Use someone who has local experience in planting and establishment of wildlife meadows to plan and conduct oversight for the project. Use a mix of native warm season grasses and wildflowers (if viable) that is based on site conditions and the potential for successful establishment and long term maintenance. Avoid the use of seed mixes that contain exotic and potentially invasive plant seeds.

- Evaluate the viability of establishing a wildlife meadow in the mowed field at the Straus Lodge in the area adjacent to the man-made pond (southeast corner of the mowed field). If it is determined that a wildlife meadow can be established and maintained at this location, then implement the action of planting the meadow. Use someone who has local experience in planting and establishment of wildlife meadows to plan and conduct oversight for the project. Use a mix of native warm season grasses and wildflowers (if viable) that is based on site conditions and the potential for successful establishment and long term maintenance. Avoid the use of seed mixes that contain exotic and potentially invasive plant seeds.
- The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of terrestrial habitat management practices that require terrain alteration. Terrestrial habitat management and conservation activities that result in terrain modification, such as physical soil preparation for planting, must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with terrestrial habitat management activities may be generated under the NHPA, NEP A, ARPA, NAGPRA, AIRFA and Executive Order 13007 (see Section 5.10).

### **5.S.5.2 Other Management Measures Considered**

A more intensive approach to terrestrial habitat management on TBBTF was considered which included more extensive creation of wildlife meadows, and the creation of more edge habitat through the creation of forest openings. The creation of more extensive wildlife meadows was determined to not be feasible prior to a determination of the success of currently proposed meadow creation and because it would limit the available managed field area for training activities. Increasing edge habitat by creating or enlarging forest openings would conflict with lease restrictions for cutting of vegetation on TBBTF and the overall goal to preserve natural vegetative areas on the facility.

## **5.6 SENSITIVE AND SIGNIFICANT HABITATS MANAGEMENT**

Sensitive and significant habitats were identified and characterized on TBBTF based on a study conducted by the Maryland Natural Heritage and Wildlife Diversity Program (1995) to inventory rare, threatened, and endangered species and sensitive habitats on the facility. Fourteen sensitive or significant sites were identified on TBBTF in the survey (see Section 3.13 for a discussion of the habitats). Figure 3-5 provides the names and approximate locations of the identified sites. Most of the sensitive habitats identified in the survey are located within the RUA. All locations where federally listed species were



identified are located in the RUA and within the 100-meter buffer to Sideling Hill Creek (see Figure 2-1). Management measures that apply to the RUA and the 100-meter buffer to Sideling Hill Creek (see Section 5.5.5) also apply to the sensitive and significant habitats where they occur within the designated use areas. Where identified sites fall outside of the RUA, TBBTF intends for the areas to remain as parts of the General Use Area, but to make additional efforts to minimize impacts that might occur as a result of training or other activities.

The DoD Environmental Conservation Program, May 3, 1996 (DoD Directive 4715.3) states that areas that contain natural resources that warrant special conservation efforts, after appropriate study and coordination, may be designated as special natural areas. Special natural areas include botanical areas, ecological reserve areas, geologic areas, natural resources areas, riparian areas, watchable wildlife areas, zoological areas and cultural areas that have recognized special qualities or attributes. The INRMP for TBBTF recognizes the sensitive habitats identified on the facility in a manner consistent with special natural areas and provides for special management of the areas.

The following section presents general management practices and specific management measures that will be implemented to maintain, or improve, the diversity and condition of the sensitive and significant habitats on TBBTF.

### **5.6.1 Management Measures**

The following management practices and specific management measures will be implemented for sensitive and significant habitats on TBBTF:

- Inform personnel training on, or otherwise using the facility, of the location and general characteristics of sensitive habitats that occur in the area of proposed training activities, and instruct to avoid potential adverse impacts to the areas. Trainers will be briefed on the presence and general locations of sensitive habitats on TBBTF and on use restrictions in the areas prior to training activities.

The following management measures will be implemented for the sensitive and significant habitats listed below:

#### **Straus Barren**

- Training and recreational access to the Straus Barren, outside of the approved rappelling and mountaineering site, will be restricted. Access to the barren will be restricted to that necessary for monitoring or study, or for the management of invasive plant species, if determined to be necessary. Traversing of the shale barren will be avoided to minimize disturbances to the natural vegetation and to prevent potential impacts to state endangered, threatened and rare plants that occur on the barren (see Section 3.13.1, 3.16 and 5.9 for a discussion and list of state threatened, endangered and sensitive plant species occurring on the barren).
- Rappelling and mountaineering will be restricted to the approved area in the western section of the Straus Barren. Four training sites (fingers) have been approved.

Training will be restricted to one or two of the four approved sites per year. Active sites will be rotated on a yearly basis. For example, one or two sites will be used for a training year, then training activities will be moved to the adjacent sites and use of the previously active sites will be restricted. Conditions on the resting sites will be monitored to determine if they restabilize and vegetation reestablishes if and where it was impacted during training activities. If monitoring indicates that the previously active fingers do not stabilize during the rest period, then restricting training activities to one or two permanently designated fingers will be considered. The training areas will be monitored on an annual basis and following training activities to ensure that damage that might occur (e.g., development of potential erosion sites) as a result of training is addressed in a timely manner.

- The extent and potential for control of invasive plant species on the Straus Barren will be assessed. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program indicated that great mullein (*Verbascum thapsus*) and microstegium occurred on, or in the vicinity of, the Barren in 1995. Great mullein was observed on the lower slopes of the Straus Barren during a site reconnaissance of TBBTF conducted in March 2000 (see Section 5.13.1.2 for management measures to address invasive species on TBBTF).

### **Boy Scout Barren**

- Training and recreational access to the Boy Scout Barren will be restricted. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to the Boy Scout Barren (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Access to the barren outside of use of the existing road will be restricted to that necessary for monitoring or study, or for the management of invasive plant species, if determined to be necessary. Traversing of the shale barren will be avoided to minimize disturbances to the natural vegetation and to prevent potential impacts to state endangered, threatened and rare plants that occur on the barren (see Section 3.13.2, 3.16 and 5.9 for a discussion and list of state threatened, endangered and sensitive plant species that have been recorded to occur on the Boy Scout Barren).
- The extent and potential for control of invasive plant species on the Boy Scout Barren will be assessed. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 indicated that spotted knapweed (*Centaurea maculosa*) occurred along the side of the road that bisects the barren. Field surveys conducted for the development of the INRMP verified its occurrence along the road. Tree of heaven (*Ailanthus altissima*) also occurs along the road that bisects the barren. Barren brome, an invasive grass introduced from Europe, occurs on the upper slopes of the barren and is the most abundant exotic invasive plant occurring on the barren. Chickweed (*Stellaria media*) was also observed along the roadside during a site reconnaissance of TBBTF conducted in March 2000 (see Section 5.13.1.2 for management measures to address invasive species on TBBTF). Due to the sensitive nature of the Boy Scout Barren, efforts to manage and control invasive plant species on the barren will be coordinated with ongoing efforts of the Maryland Department of

Natural Resources and The Nature Conservancy to control barren brome and other invasives on the Barren.

### **North Ridge**

- Training and recreational access to the North Ridge will be restricted. Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the North Ridge area (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Training and recreational use of the North Ridge area will be minimized to reduce the potential for disturbance of the natural vegetation on steep slopes and to prevent potential impacts to state threatened and rare plants that occur on the North Ridge area (see Section 3.13.3, 3.16 and 5.9 for a discussion and list of state threatened and sensitive plant species that have been recorded to occur in the North Ridge).
- See Section 5.5.3.1 and Table 5-1 for management measures, inventory and monitoring applicable to the Sideling Hill Creek crossing for light infantry training.

### **Ziegler Bridge Barren**

- Training and recreational access to the Ziegler Bridge Barren will be restricted. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of the Ziegler Bridge Barren (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Training and recreational use of the Ziegler Bridge Barren will be restricted to reduce the potential for disturbance of the natural vegetation on steep slopes and to prevent potential impacts to rare plants that occur there (see Section 3.13.4 for a discussion of sensitive plant species occurring on the Ziegler Bridge Barren).

### **North Central Floodplain**

- Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of the North Central Floodplain (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Use restrictions are implemented to reduce the potential for disturbance of natural vegetation on the floodplain and adjacent slopes and to prevent potential impacts to rare plants that occur there (see Section 3.13.5, 3.16 and 5.9 for a discussion of state endangered and sensitive plant species that occur on the North Central Floodplain).
- *Microstegium* was identified on the upstream section of the floodplain approximately 1,000 feet downstream from the boundary of TBBTF during a site reconnaissance of the facility conducted in March 2000. The area of *microstegium* is roughly estimated to be about 15,000 square feet, based on remains of the grass from the previous years growing season. The apparent limited extent of *microstegium* in this section of the Sideling Hill Creek floodplain, along with the presence of buffers both upstream and downstream of the observed occurrence, indicate that this apparently incipient population of the grass could be controlled and eventually eradicated if it is addressed in a timely manner. *Microstegium* spreads very rapidly so immediate action will be taken to address the occurrence. Garlic mustard was also identified in the vicinity of

the microstegium occurrence and bush honeysuckle occurs as individual plants at several locations on the floodplain. Garlic mustard and bush honeysuckle will be removed as part of the activity to remove microstegium from the North Central Floodplain (see Sections 5.13.1.2 for management measures to address the microstegium occurrence and other invasive species occurring on the North Central Floodplain).

- The inventory conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 identified day lily on the North Central Floodplain. Reassess the floodplain for the occurrence and extent of day lily. Develop and implement a plan for the removal of the invasive plant species from the North Central Floodplain (see Section 5.13.1.2 for management measures to address day lily on the North Central Floodplain and TBBTF).

### **South Central Ridge and Floodplain**

- Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the South Central Ridge and Floodplain (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Limit training on the South Central Ridge and Floodplain to reduce potential for disturbance of natural vegetation on the floodplain and adjacent slopes and to prevent potential impacts to rare plants and the tiger beetle (*Cicindela ancocisconensis*) recorded to occur on the floodplain (see Section 3.13.6, 3.16 and 5.9 for a discussion of state endangered and sensitive plant species that occur on the South Central Ridge and Floodplain).
- Maintain barriers to restrict access to the ford at Sideling Hill Creek.
- Restrict access by motorized and non-motorized vehicles to the fire road that traverses the site.
- Wood's sedge (*Carex tetanica* var. *woodii*), a state endangered plant species, was reported to occur along the fire road in the inventory conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995. Prior to conducting maintenance on the fire road, characterization of the area will be conducted by an endangered species biologist to ensure that the sedge will not be adversely impacted by proposed activities.

### **Mouth of Sideling Hill Creek - Floodplain/Barren**

- The mouth of Sideling Hill Creek-Floodplain/Barren, inside the boundaries of TBBTF, is within the RUA and the 100-meter buffer to Sideling Hill Creek (see Figure 2-1). Use restrictions applicable to the RUA and the 100-meter buffer apply to the Mouth of Sideling Hill Creek-Floodplain/Barren (see Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Training in the area will be restricted to reduce potential for disturbance of natural vegetation on the floodplain and adjacent shale barrens and to prevent potential impacts to rare plants that have been recorded to occur in the habitats.

- The extent and potential for control of invasive plant species on the mouth of Sideling Hill Creek-Floodplain/Barren will be assessed. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program indicated that microstegium occurred on the site in 1995 (see Section 5.13.1.2 for management measures to address invasive species on TBBTF).

### **Sideling Hill Creek**

- Training activities in and adjacent to Sideling Hill Creek will be restricted. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of Sideling Hill Creek within the boundaries of TBBTF (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Training in, and immediately adjacent to, Sideling Hill Creek will be restricted to reduce the potential for disturbance of aquatic habitats and several sensitive flora and fauna that occur there. The creek supports one of the largest remaining populations of the federally endangered plant harperella (*Ptilimnium viviparum*). The creek also supports several sensitive fauna including the state endangered tiger beetle (*Cicindela ancocisconensis*) and the state endangered green floater mussel (*Lasmigona subviridis*) (see Section 3.13.8, 3.16 and 5.9 for a discussion and management of sensitive flora and fauna that occur in, and along, Sideling Hill Creek).
- Monitor water quality in Sideling Hill Creek (see Section 5.4.1 for management measures for monitoring water quality on Sideling Hill Creek).
- Conduct water sampling and analysis as necessary if visual or olfactory indicators of water quality degradation are observed (see Section 5.4.1 for management measures for monitoring water quality on Sideling Hill Creek).
- Maintain offsets from drainageways and intermittent streams that originate or flow through activity areas, or along roadways, (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek resulting from accidental fuel or chemical spills (see Section 5.4.1).
- Conduct routine (annual) screening level watershed assessments on TBBTF to evaluate the potential for adverse impacts to water quality in Sideling Hill Creek resulting from point and nonpoint source pollution (see Section 5.4.1).
- Maintain barriers to restrict access to the ford across Sideling Hill Creek in the South Central Ridge and Floodplain.
- Crossing of Sideling Hill Creek during training operations will be limited to the designated stream crossing for light infantry training (see Section 5.5.3.1). Crossing of the creek during training operations will be limited to foot traffic. No vehicles or machinery will use the Sideling Hill Creek crossing for transportation or for any other reason except for in response to actual emergencies.

- Assess the extent and potential for control of invasive plant species that occur in and along Sideling Hill Creek. Microstegium occurs along most of Sideling Hill Creek within the boundaries of TBBTF. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 also indicated that Arthraxon (*Arthraxon hispidus*) occurred along Sideling Hill Creek in lesser numbers mixed in with the microstegium (see Section 5.13.1.2 for management measures to address invasive species on TBBTF).
- Continue to block access to the dirt road on the east side of Ziegler Road just to the north of the Ziegler Road bridge to restrict access to potential stream crossings by off road motorized and non motorized vehicles.

### **North Creek Access**

- The North Creek Access lies partially within the 100-meter buffer to Sideling Hill Creek. Use restrictions applicable to the 100-meter buffer apply to the northern third of the North Creek Access (see Figure 2-1 and Section 5.5.5.1 for 100-meter buffer to Sideling Hill Creek use restrictions).
- Assess the extent and potential for control of invasive plant species in the North Creek Access area. The survey conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 indicated that the exotic invasive plant species microstegium and multiflora rose (*Rosa multiflora*) occurred in the North Creek Access area (see Section 5.13.1.2 for management measures to address invasive species on TBBTF).

### **Big Pool Face and Vicinity**

- Training activities will be restricted in the Big Pool Face and Vicinity. Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the Big Pool Face and Vicinity (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Training activities and use of the Big Pool Face and Vicinity area will be minimized to reduce the potential for disturbance of the natural vegetation on rock faces and steep slopes and to prevent potential impacts to state threatened and rare plants that occur in the area (see Section 3.13.3, 3.16 and 5.9 for a discussion and list of state threatened and sensitive plant species occurring in the Big Pool Face and Vicinity).
- Training activities such as climbing or rappelling on the rock outcrops, or any other activity that could destabilize rocks or sensitive plant communities growing in the crevices or on ledges will be restricted on the Big Pool Face.

### **Little Barren**

- Restrict training and recreational activities on the Little Barren. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of the Little Barren (see Figure 5-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions).

### **Lower Sideling Hill Creek Floodplain and East Slopes**

- Restrict training activities in the Sideling Hill Creek Floodplain and East Slopes. Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the area (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Training and recreational use of the Sideling Hill Creek Floodplain and East Slopes area will be minimized to reduce the potential for disturbance of the natural vegetation and to prevent potential impacts to state threatened, endangered and rare plants that occur on the floodplain and adjacent slopes (see Section 3.13.12, 3.16 and 5.9 for a discussion and list of sensitive plant species occurring in the Sideling Hill Creek Floodplain and East Slopes).
- Training activities and other uses within the Sideling Hill Creek Floodplain and East Slopes will avoid wetlands and vernal pools that occur on the site. Prior to conducting any activities with the potential to adversely impact wetlands or vernal pools, an assessment of the potential impacts will be conducted and alternatives that will avoid the impacts will be considered and, where possible and consistent with the military mission, implemented (see Sections 5.5.1 and 5.5.2 for management of wetlands and vernal pools on TBBTF).
- See Section 5.5.3.1 for management measures, inventory and monitoring applicable to the Sideling Hill Creek Stream Crossing for light infantry training.

### **Carex Fire Slope**

- Conduct annual monitoring to track plant species succession on the Carex Fire Slope (see Figure 2-1 for the location of the Carex Fire Slope). Current vegetation on the Carex Fire Slope will be compared with similar adjacent unburned habitats to establish a general characterization of plant reestablishment and succession from the occurrence of the fire (1993) until present (see Section 5.14).

### **Northeast Woodlands**

- No management measures specific to the Northeast Woodlands are prescribed. See terrestrial habitat management (Section 5.5.5) for management measures applicable to the Northeast Woodlands.

### **5.6.2 Other Management Measures Considered**

The absolute restriction of all personnel from the 14 sensitive and significant habitats identified on TBBTF was considered as a management alternative. This management approach was not chosen because it conflicts with the primary mission goal of TBBTF to provide a quality training experience. The dual goals of protecting these areas while providing a quality training experience are not mutually exclusive. By limiting activities in most of the identified habitats through implementation of the RUA and 100-meter Sideling Hill Creek Buffer restrictions, potential impacts associated with training activities are minimized. All training activities on shale barrens on TBBTF are restricted except at the designated rappelling site on the Straus Barren. Training activities are also



restricted in Sideling Hill Creek except at the designated stream crossing for light infantry training. Training and protection of sensitive habitats is accomplished by implementing use restrictions, assessing ecological conditions on a periodic basis and by modifying uses through adaptive management if impacts to habitats are determined to be occurring.

## **5.7 WILDLIFE MANAGEMENT**

Army Regulation 200-3 states that wildlife management should provide for the management of wildlife populations and their habitats in a manner that is consistent with accepted scientific principles, is in compliance with the Endangered Species Act and other applicable laws and regulations, and is in harmony with the total natural resources management program. Emphasis on wildlife management is placed on the maintenance and restoration of habitat suitable to the production of indigenous wildlife.

As a signatory member of the North American Waterfowl Management Plan Cooperative Agreement with USFWS, the Secretary of the Army reflects the importance of participating in the international effort to restore declining waterfowl populations. The plan provides the framework for a waterfowl conservation and management effort by describing population and habitat goals and suggesting recommendations that will resolve problems of international concern.

There are no perimeter fences around TBBTF, so wildlife species can access and leave the facility without restriction. The land surrounding and encompassing TBBTF, except on its western and part of its northern boundaries, is part of the Sideling Hill Wildlife Management Area. Wildlife species on land surrounding TBBTF, including the facility to the east of Sideling Hill Creek, are managed by the DNR. Because of the limited size of the facility, its proximity to and partial inclusion in the Sideling Hill Wildlife Management Area, and the lack of a perimeter fence, management of wildlife species on TBBTF is consistent, for the most part, with DNR management of the area. Game species on TBBTF are not actively managed by MDARNG. Hunting on TBBTF is restricted to the property on the eastern side of Sideling Hill Creek and is managed by DNR. Hunting seasons, permit schedules, bag limits and hunting regulations on the eastern side of TBBTF are the same as those established for the State of Maryland.

The goal of wildlife management on TBBTF is to maintain indigenous wildlife species by preserving natural habitats and applying integrated ecosystem management principles in the implementation of the military mission and the management and maintenance of natural resources. The basis of managing a rich assemblage of wildlife is to provide an array of habitats that are structurally and biologically diverse and healthy. Many of the management measures prescribed for terrestrial (Section 5.5.5), riparian (Section 5.5.3), aquatic (Section 5.5.4), and wetland (Section 5.5.1) habitats on TBBTF also apply to wildlife management on the facility, particularly where they are intended to maintain or enhance biodiversity on the property.

### 5.7.1 Management Measures

The following management practices and specific measures will be implemented for wildlife management on TBBTF:

- Open areas associated with the maintenance and administrative areas and the field surrounding Strauss Lodge will be maintained to provide non-forest and edge habitat for white tailed deer (*Odocoileus virginianus*). In addition, the preservation of existing edge and transitional habitats will provide habitat for many bird species and other larger wildlife that utilize the habitats due to the close association of cover and forage areas.
- Record and report sightings of black bear (*Ursus americanus*) to the DNR.
- Activities of beaver (*Castor canadensis*) in the southeastern corner of TBBTF along Sideling Hill Creek, and at other locations, if they are determined to be present, will be monitored for potential adverse impacts to sensitive habitats. At present, no management is prescribed for beaver on TBBTF. If it is determined that beaver activity may be causing adverse impacts to sensitive or protected species on the facility, then approaches for their management (e.g. live trapping and relocation) will be considered. Specifically, changes in water levels caused by beaver activities that could potentially adversely impact harperella will be monitored.
- Maintain aquatic species diversity by preserving natural systems both in and adjacent to water bodies on TBBTF. At TBBTF these natural systems include wetlands, riparian areas, and the sensitive and significant habitats located in or adjacent to the water bodies. Implementing use restrictions in the 100-meter buffer zone and RUA will help to ensure that natural systems along Sideling Hill Creek are preserved (see Section 5.5.4.1).
- Allow snags and dead trees to remain standing where they are not causing a threat to personal safety or structures on TBBTF. In particular, hollow butt trees and trees with holes in their trunk for habitat will be left standing where they do not cause a safety threat (see Section 5.5.5).
- Maintain coarse woody debris and fallen logs on the forest floor where they do not pose a significant obstacle to training activities or are not a potential fire hazard (see Section 5.5.5)
- The applicability and viability of installing nest boxes at locations on TBBTF for target species (e.g. wood ducks (*Aix sponsa*), eastern bluebird (*Sialia sialis*), etc.) will be evaluated. If appropriate areas are located with the potential to attract target species, then nest boxes will be installed. Where appropriate, predator guards will be installed on the boxes. Boxes will be inspected annually for use. Additional boxes may be installed where monitoring determines that use is high. When it is determined that boxes are not being used, they will be relocated as necessary to attract use by the targeted species.

- Use regionally native plant species in landscaping and maintenance projects where suitable conditions exist, and it is cost effective and practical. TBBTF will use non-invasive plant species in landscaping and maintenance projects wherever a native alternative is not possible.
- Evaluate the viability of establishing a wildlife meadow in the mowed area behind (east end) the Baker Building (see Section 5.5.5.1).
- Evaluate the viability of establishing a wildlife meadow in the mowed field at the Straus Lodge in the area adjacent to the water supply pond (southeast corner of the mowed field) (see Section 5.5.5.1).

### **5.7.2 Other Management Measures Considered**

Additional management measures that were considered for wildlife on TBBTF, but that are no longer being considered, include allowing hunting on the western side of Sideling Hill Creek to help manage deer populations on the facility. Allowing hunting on western side of Sideling Hill Creek is no longer being considered for safety reasons, due to the potential for impacts to sensitive habitats and plant species, and because its effect on management of deer populations on the facility would be minimal. All of the lodge and camp areas on TBBTF are located on the western side of Sideling Hill Creek. Training activities and uses by the boy scouts are typically concentrated on the western side. In addition, use of the facility by the boy scouts is typically high during deer hunting seasons. Allowing hunting on the western side of the facility would increase the potential for hunting related accidents involving troops, boy scouts, or other users of the facility. Increased traffic by hunters, not familiar with sensitive habitats or species on the facility, would also increase the potential for adverse impacts to the habitats and species. Allowing hunting on the western side of the facility would also have a limited effect on the management of deer populations on TBBTF due to the size of the area and lack of boundary fencing.

Planting food plots on TBBTF to attract target species was considered for the enhancement of wildlife, but rejected because of the probable necessity to clear wooded areas, the intensity of labor to establish and maintain the plots, and the potential to promote the establishment of exotic invasive species. Lease restrictions affecting TBBTF also prohibit the cutting or clearing of vegetation over most of the facility. Prescribed burning was also considered to enhance habitat for targeted species but was rejected because it is not currently considered an accepted approach to habitat management on TBBTF and because its potential affects on some of the sensitive habitats and species on the facility are not well understood.

## **5.8 FISHERIES MANAGEMENT**

Army Regulation 200-3 states that fisheries management should provide for the management of fish populations and their habitats in a manner that is consistent with accepted scientific principles, is in compliance with the Endangered Species Act and

other applicable laws and regulations, and is in harmony with the total natural resources management program. Emphasis on management will be placed on the maintenance and restoration of habitat suitable to the production of indigenous fish and wildlife.

Fisheries in Sideling Hill Creek, within the boundaries of TBBTF, are managed by the DNR Freshwater Fisheries Division. Fishing seasons, permit schedules, and fishing regulations on TBBTF are the same as those established for the State of Maryland. The creek is managed as a recreational trout stream and is typically stocked with 8,000 rainbow trout (*Oncorhynchus mykiss*) annually. The trout stocking schedule for Sideling Hill Creek for the spring of 2000 included 2,000 fish stocked in March, 4,000 in April, and 2,000 in May (MDDNR, 2000). The fish are stocked for eventual harvest and management is not intended to establish a permanent trout population in the creek. The stream is fished for trout from the spring into early summer. Sideling Hill Creek is a warm water fishery and also supports a diverse and abundant population of naturally reproducing fish (see Section 3.14.4 for a list of fish species that typically occur in Sideling Hill Creek). The primary warm water species fished for on the creek include smallmouth bass (*Micropterus dolomieu*), rock bass (*Ambloplites rupestris*), and bluegill (*Lepomis*, sp.). Warm water fish species are not stocked in Sideling Hill Creek.

The man-made water supply pond located adjacent to the Straus Lodge contains primarily largemouth bass (*Micropterus salmonoides*) and bluegills. The pond is managed by the site manager and fishing is limited to permitted users of TBBTF. Fishing on the pond is on a catch and return basis.

The availability of suitable habitat and habitat protection are essential for maintaining viable fisheries. The condition of floodplains, riparian areas and the surrounding watershed are important factors affecting the water quality and condition of physical habitat for fisheries. Management measures for fisheries on TBBTF are aimed at ensuring that activities and conditions within and surrounding waterbodies on TBBTF do not adversely affect water quality and habitat for fisheries on the facility.

### **5.8.1 Management Measures**

Management measures for the fisheries on TBBTF are similar to, and consistent with, those established for soil management, water resources, riparian areas and aquatic habitats on TBBTF. The following management measures will be implemented for fisheries on TBBTF:

- Survey the fish population in the man-made pond to determine size, structure, and biological integrity of the fish communities. Survey results will be used to determine if management efforts are necessary to balance fish populations and diversity in the pond.
- Prohibit the use of live fish for bait in the man-made pond to avoid unwanted species introduction.

- Conduct routine (semi-annual) water quality sampling/monitoring on Sideling Hill Creek on TBBTF to prevent potential degradation in water quality from going unnoticed. Frequent water quality monitoring provides a mechanism for the early detection of potential problems and makes it easier to identify the source/cause of the degradation (see Section 5.4.1 for management measures for monitoring water bodies on TBBTF).
- Conduct water sampling and analysis as necessary if visual or olfactory indicators of water quality degradation are observed (see Section 5.4.1 for management measures for monitoring water bodies on TBBTF).
- Conduct routine (annual) screening level watershed assessments on TBBTF to evaluate the potential for adverse impacts to water bodies both on and off of the facility (see Section 5.4). The assessments will evaluate surrounding land uses and identify potential sources of point and nonpoint source pollutant loadings to water bodies on TBBTF.
- Based on the results of the screening level watershed assessments, identify potential sources of pollutant loadings to water bodies on TBBTF and identify and prioritize management measures to minimize adverse impacts to water quality and aquatic habitats.
- Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the Restricted Use Area (RUA) established in the lease agreement between MDARNG and DNR (see Figure 2-1).
- Turf management chemicals for TBBTF landscape maintenance will be applied minimally, only when specific problems are identified, and in conformance with appropriate standards. Turf management chemicals will not be applied in areas immediately adjacent to the man-made pond. Due to slopes adjacent to the pond, a 100-foot buffer restricting the use of turf management chemicals should be maintained around the pond. No turf management chemicals will be applied within the 100-meter buffer on Sideling Hill Creek or the RUA.
- Pesticides and fertilizers will be applied in conformance with appropriate standards, and should not be used within 100 feet of the man-made pond, tributaries to Sideling Hill Creek, or within the 100-meter buffer to Sideling Hill Creek or the RUA.
- Offsets from drainageways and intermittent streams on TBBTF that originate or flow through activity areas, or along roadways, will be maintained (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek, or downstream waterways, resulting from accidental fuel or chemical spills.
- Maintain fisheries diversity by preserving natural systems both in and adjacent to water bodies on TBBTF. At TBBTF these natural systems include wetlands, riparian areas, and the sensitive and significant habitats located in or adjacent to the water bodies. Implementing use restrictions in the 100-meter buffer zone and RUA will

help to ensure that natural systems along Sideling Hill Creek are preserved. Additional management measures prescribed in Sections 5.4.1, 5.5.3.1, 5.6.1, and 5.13.1 will further help to ensure that natural systems are preserved in and adjacent to Sideling Hill Creek.

### **5.8.2 Other Management Measures Considered**

A less intensive approach to fisheries management was considered, but rejected. The less intensive approach did not include water quality monitoring or the implementation of best management practices to maintain water quality and habitat in the waterbodies on TBBTF. This alternative was rejected because water quality monitoring is necessary to determine whether the waterbodies on the facility represent a health hazard to fisheries. Routine sampling will provide the data for the early detection of water quality problems. Early detection of water quality degradation will allow remedies to be evaluated and implemented in a timely manner. Implementation of best management practices to prevent nonpoint source pollution from entering waterbodies on TBBTF will also minimize potential for the development of water quality problems and the resultant adverse impacts to fisheries on TBBTF.

## **5.9 RARE, THREATENED, AND ENDANGERED SPECIES MANAGEMENT**

The goal of sensitive species management on TBBTF is to insure that the species and habitats that they require are maintained and preserved in a manner that will enable the continued existence of the species on the facility. Activities conducted on the facility will be done in a manner consistent with applicable laws, DNR lease agreements and the practice of responsible stewardship for the preservation of the species on TBBTF.

Section 7 of the Endangered Species Act (16 U.S.C. §1536) states that all Federal agencies will insure that any actions authorized, funded, or carried out by them will not jeopardize the continued existence of any federally endangered or threatened species, or result in the destruction or adverse modification of the habitats of such species. The purposes of the Act are to provide a means whereby the ecosystems upon which federally threatened or endangered species depend may be conserved and to provide a program for the conservation of the species. AR 200-3 requires installations to prepare Endangered Species Management Plans (ESMPs) for federally listed species and critical habitats present on a facility. The federally endangered plant harperella (*Ptilimnium vivparum*) occurs in Sideling Hill Creek on TBBTF. The USFWS, DNR and TNC have been, and are currently, implementing management and monitoring efforts for the conservation of harperella in Sideling Hill Creek on TBBTF. Management measures prescribing cooperation with ongoing agency conservation efforts along with additional management measures to ensure the protection and viability of harperella on TBBTF are included in the INRMP. Preparation of an ESMP for harperella on TBBTF has not been prescribed as a separate management activity because conservation and management of the plant is addressed by current agency activities and management measures prescribed in the INRMP.

The Endangered Species Act does not provide protection to state listed rare, threatened, or endangered species if they are not also federally listed. Designation as a state listed rare, threatened or endangered species in Maryland is determined by the state's Natural Heritage and Wildlife Diversity Program and is based on rarity and threat. The program is responsible for identifying and ranking rare and endangered species and their habitats, monitoring the species to assess threats to their survival, and protecting the species through information exchange and environmental review, coordination with land managers and private landowners, and the development of acquisition and easement priorities. The state rarity ranking by itself does not mandate protection. MDARNG views the protection of state listed species as a matter of responsible stewardship and will manage TBBTF in a manner that is consistent with implementation of the military mission and that will prevent undo harm to listed species.

### **5.9.1 Management Measures**

The following general and species specific management measures will be implemented on TBBTF;

- Inform personnel training on, or otherwise using the facility, of the potential presence of sensitive species in training areas, and instruct to avoid potential species locations when feasible. Trainers will be briefed on the presence and general locations of sensitive plant species and habitats on TBBTF prior to training activities. Trainers will be instructed to avoid these areas, when feasible, during training activities.
- Prioritize consideration of invasive species management in areas where it is determined that known existing sensitive plant species are in danger of adverse effects from their presence (see management measures for invasive species in Section 5.13).
- Monitor microstegium populations along Sideling Hill Creek to determine if the grass is directly competing with sensitive plant species along the creek. Areas where microstegium is determined to be directly competing with sensitive plants will be targeted as priority sites for removal of the invasive grass (see management measures for invasive species in Section 5.13).

#### **5.9.1.1 Harperella (*Ptilimnium viviparum*) - Federally Endangered**

Sideling Hill Creek supports one of the largest remaining populations of harperella. A significant portion of the harperella population in Maryland occurs along Sideling Hill Creek and on TBBTF. Habitat conservation activities for harperella in Maryland have been concentrated along Sideling Hill Creek under a cooperative effort between The Nature Conservancy, Western Pennsylvania Conservancy, Maryland Natural Heritage and Wildlife Diversity Program, and USFWS. The conservation efforts have concentrated on habitat protection through landowner contact, land acquisition, conservation easements, and voluntary agreements with landowners to protect shorelines; public outreach through the local media, newsletters, volunteer activities, and field trips; land use planning directed at preserving harperella habitat; and public land management



designed to ensure that habitat quality for harperella is maintained. As part of the public land management efforts, TBBTF was surveyed by the Maryland Natural Heritage and Wildlife Diversity Program (MDNHP, 1995). The study, commissioned by MDARNG, inventoried the facility for Federal and state rare species, including harperella; described the populations, their habitats, and threats to the habitats; and defined management needs. Specific issues raised as a result of the study included potential ways to accommodate training on the facility while avoiding impacts to harperella and other rare species, and approaches to address invasive weed populations on TBBTF.

The Nature Conservancy has been monitoring populations of harperella in Sideling Hill Creek since 1988. Monitoring efforts are designed to track the vigor and health of harperella populations and to record the health and stability of occupied habitats (see Section 3.16 for a discussion of monitoring results).

The following management measures will be implemented for the protection of harperella on TBBTF:

- Coordinate with USFWS, DNR, and TNC to ensure that natural resources management activities are consistent with current and past conservation and monitoring efforts by the agencies for harperella on TBBTF.
- On an annual basis and following agency monitoring activities coordinate with the agencies to determine the current extent and locations of harperella on Sideling Hill Creek within the boundaries of TBBTF. Documenting current locations of harperella on TBBTF will further ensure that management and other activities adjacent to Sideling Hill Creek do not adversely effects harperella populations on the facility.
- Implement training and use restrictions in and immediately adjacent to Sideling Hill Creek. Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the Restricted Use Area (RUA) established in the lease agreement between MDARNG and DNR (see Figure 2-1).
- Inform personnel training on, or otherwise using the facility, of the presence of harperella in Sideling Hill Creek. Trainers will be informed that the plant is present in, and along the floodplain of Sideling Hill Creek and that crossing of the creek or training activities in the creek are restricted. Instream crossing of the creek during training activities will be limited to the approved Sideling Hill Creek Crossing on a prearranged basis. Trainers will be briefed on the presence of harperella prior to training activities.
- Coordinate with agencies (DNR, TNC) currently conducting monitoring of harperella in Sideling Hill Creek within the boundaries of TBBTF to expand efforts to include the entire length of the creek within the facility.
- Monitor microstegium in and along Sideling Hill Creek to determine if the invasive grass is adversely affecting harperella populations on the creek.

- Activities to control microstegium and other exotic invasive species along Sideling Hill Creek will be prioritized based on potential adverse impacts to harperella (see management measures for invasive species in Section 5.13).
- Offsets from drainageways and intermittent streams on TBBTF that originate or flow through activity areas, or along roadways, will be maintained (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek, or downstream waterways, resulting from accidental fuel or chemical spills.

#### 5.9.1.2 State Listed Fauna

State listed threatened or endangered fauna identified on the facility include: a tiger beetle (*Cicindela ancocisconensis*), the green floater mussel (*Lasmigona subviridis*), and the yellow lampshell mussel (*Lampsilis* sp.). In addition, the Olympia marble (*Euchloe olympia*), a State listed butterfly In-Need-of-Conservation has been found on the Boy Scout Barren in small numbers. MDARNG views the protection of state listed species as a matter of responsible stewardship and, where necessary, will implement protective measures to ensure the maintenance of healthy populations of the species on TBBTF. The following management measures for state listed fauna on TBBTF will be implemented:

- Known habitats and locations of state listed fauna on TBBTF will be protected from adverse impacts associated with training, general use, and the implementation of natural resources management activities.
- Access and use restrictions in the RUA and 100-meter buffer to Sideling Hill Creek will continue to be implemented (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer area restrictions).
- Known populations of state listed fauna species will be monitored to detect long term changes in the status of populations on TBBTF.
- Water quality and watershed monitoring will be implemented as prescribed in Section 5.4.1 to enable early detection of potential adverse effects to rare mussel species that have been recorded to occur in Sideling Hill Creek on TBBTF.
- Conduct a screening level survey for potential rare mussel species occurring in Sideling Hill Creek on TBBTF. The screening level survey will be conducted during low flow conditions and will consist of the identification of mussel/clam shells occurring on the banks and bars along the creek. Disturbance of live mussels occurring in the creek will be avoided. The purpose of the survey is to supplement past studies conducted on Sideling Hill Creek on TBBTF.
- Dimilin® or Bt (*Bacillus thuringiensis*) will not be sprayed for gypsy moth control in the vicinity of shale barrens on TBBTF due to the recorded presence of the Olympia marble (*Euchloe olympia*) on the Boy Scout Barren and the potential for the presence of other rare Lepidoptera (butterflies and moths) on shale barrens on the facility.

### 5.9.1.3 State Listed Flora

Nineteen state listed threatened or endangered plant species were identified on TBBTF during the Natural Heritage and Wildlife Diversity Program survey conducted in 1993 and 1994 for rare, threatened and endangered species and habitats on the facility. MDARNG views the protection of state listed species as a matter of responsible stewardship and, where necessary, will implement protective measures to ensure the maintenance of healthy populations of the species on TBBTF. The following general management measures for state listed flora on TBBTF will be implemented:

- Known habitats and locations of state listed plant species on TBBTF will be protected from adverse impacts associated with training, general use, and the implementation of natural resources management activities.
- Access and use restrictions in the RUA and 100-meter buffer to Sideling Hill Creek will continue to be implemented (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer area restrictions).
- Known populations of state listed plant species will be monitored to detect long term changes in the status of populations on TBBTF.

The following species specific management measures will be implemented for state listed plant species on TBBTF:

- **Broad-glummed broam (*Bromus latiglumis*).** Inventory the area in, and adjacent to, the power line/fire break on the Lower Sideling Hill Creek Floodplain and East Slopes for the presence of broad-glummed brome to ensure that efforts to remove multiflora rose from the area will not adversely effect the state endangered plant. If the plant does occur in the area, modify methods to remove multiflora rose, as necessary, to avoid adverse impacts to the plant (see Section 5.13.1.2).
- **Stellate sedge (*Carex radiata*).** Inventory the area in, and adjacent to, the power line/fire break on the Lower Sideling Hill Creek Floodplain and East Slopes for the presence of stellate sedge to ensure that efforts to remove multiflora rose from the area will not adversely affect the state endangered plant. If the plant does occur in the area, modify methods to remove multiflora rose, as necessary, to avoid adverse impacts to the plant (see Section 5.13.1.2).
- **Wood's sedge (*Carex tetanica* var. *yvoodii*).** Monitor streambanks along the Lower Sideling Hill Creek Floodplain and East Slopes and the South Central Ridge and Floodplain for active erosion. If active streambank erosion is determined to be occurring, survey the banks where the erosion is occurring for the presence of Wood's sedge. Evaluate the feasibility of implementing management measures to stabilize streambank erosion if it is determined to be threatening populations of Wood's sedge. Monitoring should be conducted on an annual basis and following major storm or flood events.

- **Standley's goosefoot (*Chenopodium standleyana*).** Restrict training activities on the Straus Barren to the approved rappelling and mountaineering site.
- **Small-headed sunflower (*Helianthus micro cephalus*).** Inventory the area in, and adjacent to, the power line/fire break on the Lower Sideling Hill Creek Floodplain and East Slopes for the presence of small-headed sunflower to ensure that efforts to remove multiflora rose from the area will not adversely effect the state endangered plant. If the plant does occur in the area, modify methods to remove multiflora rose, as necessary, to avoid adverse impacts to the plant (see Section 5.13.1.2).
- **Crested iris (*Iris cristata*).** Monitor streambanks along the Lower Sideling Hill Creek Floodplain and East Slopes and the South Central Ridge and Floodplain for active erosion. If active streambank erosion is determined to be occurring, survey the banks where the erosion is occurring for the presence of crested iris. Evaluate the feasibility of implementing management measures to stabilize streambank erosion if it is determined to be threatening populations of crested iris. Monitoring should be conducted on an annual basis and following major storm or flood events.
- **Harperella (*Ptilimnium viviparium*).** See Section 5.9.1.1.

#### 5.9.1.4 State Rare and Watchlist Flora

Twenty-three state rare or watchlist plant species were identified on TBBTF during the Natural Heritage and Wildlife Diversity Program survey conducted in 1993 and 1994 for rare, threatened and endangered species and habitats on the facility. Table 3-7 provides the names, preferred habitats, general locations on TBBTF and the status of the rare and watchlist plant species that were identified in the survey. The following management measures for state rare and watchlist flora on TBBTF will be implemented:

- Known habitats and locations of state rare and watchlist plant species on TBBTF will be protected from adverse impacts associated with training, general use, and the implementation of natural resources management activities.
- Access and use restrictions in the RUA and 100-meter buffer to Sideling Hill Creek will continue to be implemented (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer area restrictions).

#### 5.9.2 Other Management Measures Considered

Protection of federally listed species is mandated by Federal law and ARNG regulation requires protection of state listed and rare species so other management alternatives that would have provided less protection were not considered. In addition, the absolute restriction of training activities in all areas supporting state listed, rare, or watchlist species was not considered as a viable management alternative because it would not support implementation of the military mission. TBBTF can successfully protect and manage state listed, rare and watchlist species by monitoring their location and planning training to avoid potential disturbances.

## **5.10 CULTURAL RESOURCES MANAGEMENT**

The primary goal of cultural resources management is to implement the INRMP for TBBTF in a manner that ensures the conservation of cultural resources on the facility. A statewide Integrated Cultural Resources Management Plan applicable to TBBTF is currently being developed. Guidelines established in the plan for the preservation and management of cultural resources will be implemented at TBBTF once the plan is completed.

Based on correspondence with the Maryland Department of Housing and Community Development, Division of Historical and Cultural Resources, their files show no inventoried archeological sites on TBBTF or professional surveys to locate such sites (see Appendix A). There is the potential for the occurrence of prehistoric archeological resources in the valley of Sideling Hill Creek because prehistoric Indian sites were often located near streams in the area. There is also the potential for the occurrence of historic archeological resources on TBBTF associated with a grist and sawmill that was shown to be located just upstream of the boundary of the facility along Sideling Hill Creek on an 1877 map of Washington County's Hancock District. Other historical sites or features located in the immediate vicinity of TBBTF include the C&O Canal, located just outside of the southern boundary of the facility, and a section of milepost 126 to milepost 160 of the Railway Right-of-Way, also located adjacent to the southern boundary of the facility. The Railway Right-of-Way is listed in the National Register of Historic Places.

Training activities conducted on TBBTF by the MDARNG are restricted by the 100-meter buffer to Sideling Hill Creek and the RUA (see Figure 2-1 and Section 5.5.5.1 for RUA and 100-meter buffer to Sideling Hill Creek use restrictions). Lease agreements with the DNR and additional restrictions placed by MDARNG limit activities in the areas around Sideling Hill Creek. Use restrictions prohibit excavations, the building of structures, or the cutting or removal of vegetation. Vehicle use is restricted to established roads and parking areas except under specific authority of the site manager for emergency purposes. Impacts to potential historic or archeological resources on TBBTF associated with implementation of the INRMP should not occur due to the types of management measures that are prescribed, the nature of training activities, and restrictions on the types of activities that are allowed. If potential cultural resources are discovered on TBBTF they will be protected and procedures to accomplish consultation requirements under Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. §§ et seq.) as amended, will be implemented if there is potential for an undertaking to affect the resource. Other pertinent consultation requirements associated with the Archeological Resources Protection Act (16 U.S.C. §470 et seq.), the Antiquities Act of 1906 (16 U.S.C. §§431-433), the Native American Graves Protection and Repatriation Act (25 U.S.C. §§3001 et seq.), the American Indian Religious Freedom Act (42 U.S.C. §1996), or EO 13007 (Indian Sacred Sites) will also be accomplished as required.

### **5.10.1 Management Measures**

The following management measures will be implemented to protect potential cultural resources on TBBTF:

- Trainers or other users of TBBTF will be advised of the potential for the occurrence of cultural resources on the facility prior to training activities. Trainers will be briefed on the proper operating procedures to be followed if cultural resources are discovered.
- Soldiers or other personnel using TBBTF will not remove or disturb, or cause or permit to be removed or disturbed, any historical, archaeological, architectural or other cultural artifacts, relics, vestiges, remains or objects of antiquity. If such items are discovered on TBBTF they will be protected from further disturbance and reported to the Site Manager. The Site Manager will take steps to ensure that the items are not disturbed while further guidance on the potential historical relevance and proper care of the item(s) is obtained.
- Training activities will be directed to avoid the cemetery located in the southeast section of TBBTF. Land navigation points will be located away from the cemetery to avoid potential disturbance of the area.

### **5.10.2 Other Management Measures Considered**

A less stringent approach to ensure that potential cultural resources on TBBTF are protected was considered, but rejected. The less stringent approach would not require briefing of trainers on the proper actions to be taken if potential cultural resources are discovered. Limiting activities in areas where cultural resources are likely to occur on TBBTF limits the potential that adverse impacts will occur as a result of training activities or implementation of the INRMP. However, because there is the potential for the occurrence of cultural resources on the facility, precautions will be taken to ensure that they will not be damaged or otherwise unnecessarily disturbed, if they are discovered.

## **5.11 FOREST MANAGEMENT**

The Army Forest Management Program is required to support and enhance the immediate and long-term military mission and meet natural resource stewardship requirements set forth in Federal laws (HQDA, 1995).

It is Department of Army policy to maintain, restore, and manage its forest lands on an ecosystem basis. The objectives and benefits of forest ecosystem management include biodiversity of species and habitats; natural beauty; outdoor recreation opportunities; wildlife habitat, including threatened and endangered species; soil conservation and watershed protection, including erosion control; improvement of air and water quality; sustained production of commercially valuable forest products; noise abatement; and the

maintenance of viable and diversified training lands to meet the military mission (HQDA, 1995). The goal of forestry management at TBBTF is to maintain ecosystem viability and the forest cover required to support the military mission.

Forest management enhances the military mission on TBBTF by maintaining a healthy forest ecosystem necessary to provide realistic training conditions. Practices such as protection against wildfire, disease, insects and invasive species help to ensure that healthy forest conditions are maintained over time.

### 5.11.1 Management Measures

Army Regulation 200-3 states that ARNG use and management of lands leased by them will be treated in accordance with lease documents that are in effect. The lease agreement between MDARNG and DNR states that the General Use Area will be used only for military and nonmilitary training purposes including, but not limited to, small unit wilderness training, survival training, land navigation training, water skills, overnight youth groups, assemblies, etc. The lease agreement further limits the use of the Restricted Use Area and specifically prohibits the clearing or cutting of any trees or vegetation of any kind. Restrictions on cutting or clearing vegetation, as established in the lease agreement, along with the limited size of TBBTF and a need to maintain forest cover for realistic training conditions, precludes the inclusion of commercial timber harvesting as a viable component of the forestry management approach on TBBTF. As a result of the limitations for commercial harvesting, along with other provisions established in the lease agreement, the forested areas on TBBTF will primarily be allowed to follow a course of natural ecological succession. No active forest management activities, including commercial timber harvests or timber stand improvement activities, will be implemented.

The management of forests on TBBTF will be based on an approach designed to allow for natural succession while implementing measures to prevent unacceptable damage and degradation of the resource resulting from disease, invasive species and wildfire. Management measures designed to address safety while using facilities on TBBTF will also be implemented.

The following forest management measures will be implemented on TBBTF:

- Conduct routine monitoring for signs of insect infestations and disease. The woolly hemlock adelgid (*Adelges tsugae*) has become locally abundant in Maryland. The adelgid can kill entire groves of hemlock after several years of infestation. Infestations of adelgid can be best detected by the presence of egg sacs on young twigs. The egg sacs can be readily observed in the spring before the eggs have hatched. Other signs of infestation include discoloring of the tree, early drop of needles, die back of branches and death of the tree. Currently, there are no recommended methods to control woolly hemlock adelgid in a forest environment. The use of chemical treatments should be avoided.

The gypsy moth (*Lymantria dispar*) has the potential to infest forested areas in the vicinity of TBBTF. Extensive areas in Garrett, Washington and Allegany Counties were defoliated in the early 1990's by the moth. Areas where egg masses exceed 250 masses per acre have a high probability for moderate to heavy defoliation. The State of Maryland Cooperative Gypsy Moth Suppression Program headed by the Maryland Department of Agriculture uses an integrated pest management approach to reduce or minimize gypsy moth population outbreaks. The program is a county-state-Federal effort that involves assistance and expertise in the control of the gypsy moth. If indications of infestations of gypsy moths are observed on TBBTF, treatment of the problem will be coordinated with the Cooperative Gypsy Moth Suppression Program. Due to the potential for rare Lepidoptera (moths and butterflies) inhabiting TBBTF, spraying with Dimilin® or Bt (*Bacillus thuringiensis*) should not be used as a method of controlling the moth.

- Control invasive species as prescribed in Section 5.13.
- The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of forest management practices that require terrain alteration. Forest management activities, such as harvesting of insect infested trees, that result in terrain modification must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with forest management activities may be generated under the NHPA, NEP A, ARP A, the NAGPRA, AIRFA and Executive Order 13007 (see Section 5.10).
- Continue to conduct training for fire prevention and reporting for users of TBBTF prior to their use (see Section 5.14).
- Post the fire danger rating at established locations on TBBTF.
- Personnel making use of the land on TBBTF will monitor and be aware of fire hazards and adjust their programs, including the suspension of activities, to avoid high hazard areas and/or periods (see Section 5.14).
- Snags will be left standing unless they are determined to be a safety hazard.

### **5.11.2 Other Management Measures Considered**

More intensive management measures including timber stand improvement activities were considered but rejected. The presence of sensitive habitats and species along with vegetation cutting restrictions established in the lease agreement and limited personnel resources precludes implementation of a more active management approach. Prescribed burning was also considered, but rejected, because of the limited size of the facility and a lack of understanding of the effects of burning on shale barren habitats.



## **5.12 AGRICULTURAL/GRAZING OUTLEASES**

Clearing of forested areas and clearing or cutting of vegetation of any kind in the RUA (see Figure 2-1) is prohibited in the lease agreement with the DNR. Clearing of forested areas in the general use area is also not allowed on TBBTF. There currently are no cleared areas on TBBTF that are suitable for agricultural/grazing outleases. No agricultural/grazing outleases have been granted in the past and this status is not expected to change.

## **5.13 REST MANAGEMENT**

Integrated Pest Management (IPM) is the method of choice for DoD pest management and disease vector control and approaches to pest management on TBBTF will be implemented in a manner consistent with approaches established for IPM. IPM is a comprehensive approach to pest control or prevention that considers various chemical, physical, and biological suppression techniques; the habitat of the pest; and the interrelationship between pest populations and the ecosystem. Control mechanisms are selected as each situation warrants. Where chemical control is used, specific pest populations are targeted when they are most vulnerable rather than by indiscriminate application of the chemicals. The overall goal for pest management on TBBTF will be to provide adequate pest control at the facility while minimizing the reliance on pesticides and herbicides, enhancing environmental protection, and maximizing the use of integrated management approaches.

IPM involves the use of four primary control strategies including mechanical and physical control; cultural control, which involves altering the environment to make it less suitable or attractive to the pest; biological control; and chemical control. The implementation of mechanical, physical and cultural controls will be used on TBBTF as alternatives to using chemical and biological controls whenever possible.

Pest management objectives on TBBTF include the protection of real estate, control of potential disease vectors, control of undesirable nuisance animals and plants and the prevention of damage to natural resources.

Damage to real estate can occur as rodents or other animals search for building access, food, nesting materials, warmth or shelter. Animals that can carry disease or that can cause other medical problems, such as flies, bees and wasps and certain rodents are also attracted to buildings, in general, for the same reasons.

The control of undesirable nuisance animals and plants is done to make the living and working areas for humans more enjoyable or safer to inhabit, but the animals or plants themselves do not pose any real threats to humans. Many insects such as spiders, ants, crickets, or bees that gain entry into, or inhabit dwellings can be nuisances. Moths and beetles can gain entry into stored foods and moths can cause damage to clothes. Animals such as stray dogs, cats, raccoons, and skunks can also become nuisances if they become accustomed to the presence of humans or to finding food near dwellings.

TBBTF has no dedicated pest management personnel. TBBTF currently uses contractors for pest management in and around buildings. The contractors treat buildings on the facility on a quarterly basis primarily for rodents, wasps and bees.

IPM will be fully implemented on TBBTF when the Integrated Pest Management Plan (IPMP) for the state and the facility is completed. The IPMP is scheduled to be completed in 2001.

Prevention of damage to natural resources is an important objective of pest management. Damage to natural resources can occur as a result of insect or insect larva infestations and from invasions of noxious or exotic plant species that displace natural and native vegetation. The primary threat associated with pests on TBBTF is to natural vegetation and natural resources as a result of the spreading of invasive insects and plant species.

Insect species known to occur in the vicinity of TBBTF and that have the potential to adversely impact vegetative species on the facility include gypsy moth (*Lymantria dispar*) and the woolly hemlock adelgid (*Adelges tsugae*). The gypsy moth was introduced into the United States in the 1860s with the intent to interbreed them with silk worms. They escaped into natural habitats and have caused deforestation of areas since the late 1800s. The gypsy moth is a serious pest of forests and during recent years has defoliated millions of acres of hardwoods in the northeast. Female moths lay clusters of eggs on and near trees. Each egg cluster can hatch from 300 to as many as 1,200 caterpillars that feed on over 500 species of trees and shrubs. Young caterpillars move up into the trees producing a thin line of silk behind them. Wind picks up the thread and young larvae and moves them to other locations. This process is called ballooning and is responsible for the natural spread of the gypsy moth. Infestations of the caterpillars can strip entire stands of trees of all of their leaves. Tree death occurs after two or three consecutive years of defoliation and sometimes after only one year. Gypsy moth populations in Western Maryland have not caused a significant threat since 1993 when their numbers greatly decreased probably due to *Entomophaga maimaiga*, an introduced biocontrol.

The woolly hemlock adelgid is a small insect closely related to the aphid. The insect feeds primarily on the young branches of hemlocks (*Tsuga canadensis*) and can cause cessation of tree growth, die back, and in some cases, death of the tree in as little as one year. The insect, which was introduced from Eurasia, has become locally abundant in Maryland.

Several invasive plant species also occur on TBBTF. A discussion of exotic invasive plant species that occur on the installation is provided in Section 3.15.6. The most prevalent invasive species on the facility is microstegium, a native grass of Asia. The grass prefers shaded moist soils on floodplains, streamsides, low woods, and wetlands. Microstegium can spread rapidly following a disturbance such as flooding or mowing and within three to five years can form dense monotypic stands that crowd out native herbaceous vegetation. Microstegium occurs on TBBTF along Sideling Hill Creek where it is a threat to native floodplain and streamside herbaceous vegetation. Management of

microstegium and other exotic invasive plant species of concern on TBBTF is discussed in Section 5.13.1.2.

### **5.13.1 Management Measures**

Management measures for pest management on TBBTF are divided into two groups. Management measures for pests, in general, are presented first under subsection 5.13.1.1 (Pest Management). Management measures for invasive plant species are presented under subsection 5.13.1.2 (Invasive Plant Species Management). Management measures for invasive plant species are separated into general management measures and management measures for specific plant species.

#### **5.13.1.1 Pest Management**

The following pest management measures will be implemented on TBBTF:

- IPM will be fully implemented at TBBTF when the IPMP for the state and TBBTF is completed. The IPMP is scheduled to be completed in late 2001.
- Mechanical and cultural strategies as an alternative to the use of chemical pesticides or herbicides will be implemented whenever possible.
- Domestic insect and other pest control measures will be applied in closed in structures as necessary. Avoid the need for chemical control methods as much as possible by maintaining the interiors and exteriors of structures so that they are not attractive to pests. Examples of practices that can be implemented to reduce the need for chemical controls in closed in structures include fixing cracks in foundations; keeping food in closed containers; emptying trashcans after building use; and keeping windows, screens and shutters closed and locked when buildings are not in use.
- Current forest pest management practices include harvest. In the event of a problem serious enough to warrant treatment, TBBTF will consider harvest of the infected trees first. The potential effectiveness and possible adverse effects of harvest, based on the nature of the problem, will be considered prior to harvest. Chemical treatments, such as the use of insecticides, will only be used as a last resort following approval by the appropriate agencies (i.e. DNR). Chemical treatments should not be used on, or adjacent to, shale barrens. If it is determined that chemical treatment is the only viable method for controlling a pest that is adversely affecting a sensitive habitat, then its use will be considered. Any use of a chemical treatment will be closely coordinated and managed to ensure that non-target species, water quality or other natural resources are not adversely affected.
- Harvest infected trees as soon as possible, after determining that harvest is a viable and effective approach, in order to prevent the spread of insect infestation or disease to other trees.

- The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of pest management practices that require terrain alteration. Pest management activities, such as harvesting of infested trees, that result in terrain modification must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with pest management activities may be generated under the NHPA, NEPA, ARP A, NAGPRA, AIRFA and Executive Order 13007 (see Section 5.10).
- Chemical treatment for gypsy moths, using Dimilin® or Bt (*Bacillus thuringiensis*) will not be used in the vicinity of shale barrens due to the high probability for the presence of rare Lepidoptera (butterflies and moths) in the habitats. These pesticides are very effective for controlling moths and butterflies and have the potential to destroy entire populations of Lepidoptera in sprayed, or downdrift areas.
- Consult the Maryland Department of Agriculture regularly concerning insect and disease problems in the surrounding forest environment to allow early identification of potential problems on TBBTF and the consideration of potential viable solutions.

#### 5.13.1.2 Exotic Invasive Plant Species Management

The Federal Noxious Weed Act and Executive Order 13112 require Federal agencies to control exotic weed species on their lands and, where within budgetary limits, to use relevant programs and authorities to: prevent the introduction of invasive species; detect and respond rapidly to and control populations of exotic plant species in a cost effective and environmentally sound manner; monitor invasive plant species populations; provide for restoration of native plant species and habitat in ecosystems that have been invaded; provide for environmentally sound management of invasive plant species; and promote public education on exotic invasive plant species and approaches to their management.

Exotic invasive plants occurring on TBBTF present a threat to several species of native plants that occur on the facility. A complete assessment of the extent of exotic invasive plant species on TBBTF has not been conducted. Based on the MDNHP, 1995 Inventory of Rare, Threatened and Endangered Species and Habitats on TBBTF and preliminary reconnaissance conducted on the facility in March and May of 2000, the dominant invasives occurring on the facility include: microstegium (*Microstegium vimineum*), garlic mustard (*Alliaria petiolaris*), multiflora rose (*Rosa multiflora*), Morrow's honeysuckle (*Lonicera morrowii*), Japanese honeysuckle (*Lonicera japonica*), barren brome (*Bromus sterilis*), Japanese barberry (*Berberis thunbergii*), spotted knapweed (*Centaurea maculosa*), tree of heaven (*Ailanthus altissima*), and great mullein (*Verbascum thapsus*). Microstegium and garlic mustard are the most prevalent invasives occurring on the facility.

The following discussion provides a summary of management approaches for the dominant exotic invasive plant species that occur on TBBTF (see Section 3.15.6 for a discussion of general characteristics and known locations of common exotic invasive plants on TBBTF):

**Microstegium.** The best known method for controlling microstegium is removal of the plant by hand or mechanical means late in the growing season, after the grass has flowered but before seeds become viable. Plants should be mowed as close to the ground as possible using a weedeater or other similar tool. Plants that are mowed too early have the potential to produce new seed heads in the axils of the lower leaves. The practice must be repeated each year over a period of up to seven years due to the long viability of microstegium's seed bank. Monitoring beyond seven years is necessary, especially along waterways, due to the potential for the introduction of new seed stock from upstream sources.

Glyphosate herbicide (RoundUp) is also effective for the control of microstegium, but its use may also affect desirable species because it is a nonselective systemic herbicide that effects all vegetation. Glyphosate should not be used where microstegium is mixed in with native plants. Glyphosate is recommended because it is biodegradable and does not migrate in the soil. Its use may be applicable at a two percent concentration in areas where microstegium has formed a monoculture. Glyphosate can be applied using a backpack sprayer. A minimum of 30 feet should be maintained as a buffer from any streams. The use of Glyphosate for the control of microstegium should only be considered where there is a potential for the control of the invasive and removal by hand or other mechanical methods are not practical.

**Garlic mustard.** The goal of garlic mustard management is to prevent seed production. Garlic mustard spreads only by seed and has a short-lived (two to five years) seed bank. The primary management objective in areas that are not infested with the plant is to prevent establishment by annually monitoring for, and removing all garlic mustard plants. The primary management objective in areas that are infested with garlic mustard is to prevent seed production (TNC, 1994). Light infestations can be controlled by hand pulling. Plants should be pulled before seeds have ripened and care should be taken to minimize soil disturbance. Cutting flowering plants at ground level is also an effective control for garlic mustard that can result in 99 percent mortality and eliminate seed production. Plants that are cut or pulled after flowering should be bagged and removed from the site. Use of glyphosate at a two percent concentration is also effective for the management of garlic mustard, but is not recommended for use on TBBTF because of the potential for harm to native and rare plant species.

**Multiflora rose.** The best control for areas that are lightly infested with multiflora rose is clearing with a shovel or grubbing hoe. The best time for clearing is when the ground is wet because root removal is much easier and more effective. Follow up control will be necessary because seeds will germinate and spread readily following the ground disturbance. Severe infestations of multiflora rose can be effectively controlled by mowing or cutting, but the treatment has to be repeated three to six times per year for a period of two to four years (VADCR, 1999). Foliar spraying with a low concentration of glyphosate is also effective for management of multiflora rose. Use of herbicides should be minimized due to the potential for harm to native and rare plant species.

**Morrow's honeysuckle or bush honeysuckle.** Bush honeysuckle roots are fairly shallow, so small to medium sized plants can be dug or pulled. Removal of plants is

easiest in the spring when soils are moist. Bush honeysuckle also leafs out earlier than most vegetation so it is easy to identify in early spring. Shovels, grubbing hoes, weed wrenches and mattocks are all effective in removing plants up to a fairly large size. Plant parts including mature fruits should be removed from the site to prevent reestablishment. Disturbance of the soil caused by removal of the shrubs can promote the establishment of other invasives, so it is necessary to monitor the site following removal. Bush honeysuckle seedlings also reappear the year following the clearing of an area. Control of mature plants followed by annual seedling pulling can be affective in controlling bush honeysuckle populations. Cutting of mature plants results in resprouting but can be effective in temporarily reducing seed stocks (TNC, 1984).

The use of glyphosate at a 20 percent concentration immediately applied to cut stumps is effective for the management of bush honeysuckle. Use of glyphosate for the control of bush honeysuckle on TBBTF is not recommended because of the potential for harm to native and rare plant species.

**Japanese honeysuckle.** Japanese honeysuckle roots are fairly shallow, so small to medium sized plants can be dug or pulled. Removal of plants is easiest in the spring when soils are moist. Japanese honeysuckle leafs out early so it is easy to identify in early spring. A maddock and similar digging tools are all effective in removing plants up to a fairly large size. The entire plant including all roots and runners should be removed. The base of the vine can be hung over the host plant above the ground following its removal. Plants bearing mature fruits should be bagged and properly disposed of when possible to prevent reestablishment. Control of mature plants followed by annual seedling pulling can be affective in controlling Japanese honeysuckle populations.

Use of glyphosate or triclopyr at a 25 percent concentration immediately applied to stems cut 2 inches above the ground is effective for the management of Japanese honeysuckle. Use of glyphosate or triclopyr for the control of bush honeysuckle on TBBTF is not recommended because of the potential for harm to native and rare plant species.

**Barren brome.** Current management practices being applied on the Boy Scout Barren by the Maryland Department of Natural Resources for the removal of barren brome include hand pulling, and cutting or mowing with a weedeater after the plant has flowered but before seeds have developed. Plants that appear to have undergone some seed development prior to pulling are bagged and removed from the site. Herbicides are not being used for the removal of barren brome from the site because of the potential for harm to native and rare plant species that occur on the barren. Monitoring of the site will be used to determine the success of the project and to determine if management approaches need to be adapted.

**Japanese barberry.** Mechanical removal of Japanese barberry is recommended in early spring because it leafs out early making it easy to identify. Cutting, pulling, or digging are effective in areas where populations are not large. Hoes, weed wrenches, pitchforks, maddocks and other similar tools are useful in removing the bushes and their roots. Thick gloves are recommended for protection from the shrub's spines (WIDNR, 1999).

Disturbance of the soil caused by removal of the shrubs can promote the establishment of other invasives, so it is necessary to monitor the site following removal.

**Spotted knapweed.** Hand pulling, grubbing, or clipping should provide control for light infestations of spotted knapweed. The plants are less likely to sprout or re-grow if they are allowed to bolt before cutting. Plants that are cut or pulled after flowering should be bagged and removed from the site. In areas where infestations of spotted knapweed are not extensive, hand pulling is recommended for control.

**Yellow day lily.** Manual removal by hand pulling is the recommended method for yellow day lily. A pitchfork, trowel or other hand tool should be used to ensure that the bulbs of the lily are removed when the plant is pulled. Plants that are pulled should be bagged and removed from the site.

**Tree of heaven.** Tree of heaven is very difficult to remove once it has established a taproot. Seedlings should be removed by hand as early as possible. Larger trees should be cut once in the early growing season and once in the late growing season. The tree will vigorously resprout, but seed production will be prevented. Continued cutting over a period of years may kill the tree. Glyphosate painted onto a freshly cut stump or sprayed onto the leaves will also kill the tree. Glyphosate should be applied in the late growing season when the plant is translocating nutrients to its roots.

**Common mullein.** Manual removal of rosettes by hand digging or pulling before the development of a sizeable tap root, or at least prior to flowering, is recommended for the control of common mullein. Hand hoeing can also be used to destroy plants while they are still small either by cutting off their tops or by exposing seedlings to the drying action of the sun by stirring the soil around the plants' base. Monitoring of bare or disturbed soils following removal of the weed is necessary because the seeds of common mullein are viable for up to 100 years. Common mullein depends on bare soils for seeds to germinate and plants to become established.

Management measures that are presented for exotic invasive plant species on TBBTF are based on the concepts of integrated pest management and adaptive management. IPM is based on developing a sound understanding of the ecology and biology of the target plant species and its environment. Understanding the ecology of the target species helps to ensure that the proper management approach will be implemented at the most effective time. Adaptive management enables treatment approaches to be developed and modified as necessary to improve the effectiveness of management. Manual and mechanical control methods will be applied in all cases where they are feasible. Judicious use of herbicides will be applied in limited situations where mechanical methods are determined to not be practical and other site conditions warrant their use.

The management measures presented below include general management measures and specific management projects. The observed locations of the plants are not inclusive of all areas that invasive species may occur on the facility. The locations of invasive plants presented below are based on the MDNHP 1995 survey and preliminary reconnaissance

conducted on TBBTF in March and May of 2000. Additional assessment of the extent of exotic invasive plants on TBBTF is necessary.

The following exotic invasive plant species management measures will be implemented on TBBTF:

- The most prevalent exotic invasive plant occurring on TBBTF is microstegium. The grass occurs in dense monotypic populations at several locations along Sideling Hill Creek and its floodplains. Microstegium also occurs along, and in the woods adjacent to the unnamed tributary that flows from the water supply pond to Sideling Hill Creek. The current extent of microstegium on TBBTF has not been determined or recorded. Assess the extent of the grass on TBBTF so that management objectives and an evaluation of the feasibility of management can be determined. Use the assessment to identify targets for initial management efforts for the control of microstegium on the facility.
- Garlic mustard occurs in small patchy to large dense populations across TBBTF. Management of garlic mustard on TBBTF will be based on recording the locations of populations as they are identified and targeting them for removal based on their extent and the availability of person power for their removal. Implement hand pulling or mechanical methods for the removal of garlic mustard. Bag and remove plants that are pulled after they have flowered. Conduct monitoring of areas where garlic mustard has been removed on a yearly basis in the spring before seeds have developed so that follow up management can be directed as needed.
- Base prioritization of invasive species management on TBBTF on the current extent of the species on TBBTF; the current and potential impact of the species; the difficulty of control; and the value of the habitats/areas that the species infest or may infest. In most cases, the highest priority for management will be based on preventing new problems from developing or spreading by immediately addressing incipient populations of exotic invasive plants. Base priority for the management of established populations on their rate of growth, the current and potential impact of the species on existing natural ecosystems and their potential adverse effect on sensitive habitats or species.
- Brief MDARNG trainers interested in invasive species management on TBBTF on the identification and proper approaches for management of the species on the facility. This will enable trainers to assist in the management of exotic invasive plant species on the facility. This will also enable trainers to train and utilize troops, when consistent with training and mission objectives, to assist in the management of invasive plants on TBBTF.
- When possible and consistent with training and mission objectives, troops will be briefed on the identification of common invasive plant species that occur on TBBTF and will assist in locating their occurrence on the facility. When possible, troops will identify the locations of invasive plant species that are observed during training operations. The approximate locations of observed invasive plant species along with



the approximate extent of the occurrences will be recorded and reported to the site manager. A database of the location and approximate extent of reported invasive species occurrences will be developed. Field verification of the reported occurrences will be conducted and the feasibility of treatment will be assessed. Data collected during training operations will be used to help develop plans for invasive species management on TBBTF.

- Where possible, prioritize newly established populations of invasive plant species for removal. Established populations should be monitored and potential for their control assessed. At a minimum, habitats should be managed to prevent direct displacement of endangered species by invasive, non-native species.
- In all cases, implement mechanical control methods for invasive species management on TBBTF where it is determined to be feasible.
- Implement a long-term inspection program to monitor the success and efficiency of invasive species management and control on TBBTF. Use personnel knowledgeable in the control and management of exotic invasive plant species to provide supervision and management oversight of exotic invasive plant management on TBBTF. Monitoring will be used to measure the success of treatment efforts, determine the need for additional (follow up) treatment, identify areas where modified approaches to treatment may be necessary (adaptive management), and to track and document the recovery of native plants in treated areas. Monitoring will also be conducted following invasive plant removal to ensure that disturbance associated with removal does not result in the reestablishment of the invasive or the establishment of different invasive plants.
- Landscaping around buildings and grounds should not include the use of landscape materials that could spread to nearby natural areas or contaminate local genetic stocks. Use regionally native plant species for landscaping where feasible. Where use of native species is not feasible, non-invasive plant species should be used.
- Limit use of herbicides for exotic invasive plant species control in areas adjacent to water bodies on TBBTF. Where it is determined that use of herbicide is the only viable approach for control of invasive plants, application should be made by personnel trained in their proper use. Minimum offsets of 30 feet should be maintained from water bodies for use of herbicides and application should be directed specifically at target species. Herbicides used in areas adjacent to water bodies should be limited to those that do not migrate in the soil and that do not persist for an extended time after application (i.e., glyphosate).
- Efforts were initiated to remove microstegium from the North Central Floodplain in the late summer/fall (August/September) of 2000. An area of microstegium occurs in the upstream section of the North Central Floodplain approximately 1,000 feet downstream from the boundary of TBBTF. The area of microstegium is roughly estimated to be about 15,000 square feet, based on remains of the grass from the 1999 growing season. The upper floodplain upstream of the affected area is wooded and

there are no signs of microstegium. Microstegium does occur on two small areas on the lower floodplain above the affected area. Early season observations of several hundred feet of the floodplain upstream of the TBBTF boundary also showed no indications of the presence of microstegium. Microstegium also was not observed in the floodplain downstream from the affected area to the Boy Scout Barren, except as patchy occurrences. The diversity of the vegetation occurring in the floodplain below the affected area would indicate that up to the current time, the extent of microstegium in this stretch of the floodplain has probably been minimal or non-existent. The limited current extent of microstegium in this section of the Sideling Hill Creek floodplain along with the presence of buffers both upstream and downstream of the observed occurrence indicates that this apparently incipient population of the grass could be controlled and eventually eradicated if it is addressed in a timely manner. Removal of microstegium from this section of the floodplain would also increase the extent of the floodplain where the grass has not become established along with the buffer between active seed sources and existing downstream populations making the potential for the future control of downstream populations more viable.

Effective treatment of the microstegium on the North Central Floodplain will probably require a combination of hand pulling around the perimeter of the invasive population along with mechanical removal (weed eaters) and possible limited and directed use of herbicide (2 percent concentration of glyphosate) in areas where monocultures of the grass are established. Observations of the proposed project site will be made prior to the planned dates for removal of the microstegium to determine the most viable treatment method and whether the use of herbicide will be necessary. The use of herbicide will be avoided if it is determined that the grass can be controlled mechanically. A population of garlic mustard also occurs within and adjacent to the microstegium occurrence. Mechanical removal of the garlic mustard should be implemented to help insure that the removal of microstegium in the area does not result in the establishment of a monoculture of garlic mustard. Additional observations will be made during pre-removal site assessment for the occurrence of other exotic invasive plant species in the vicinity of the microstegium. If additional invasive plant species are identified in the area, the management approach will be adapted to address their control.

Initial efforts to remove microstegium from the North Central Floodplain will include assistance from youth volunteers from the Challenge Program, the Maryland Native Plant Society and MDARNG. The Maryland Native Plant Society will provide botanical expertise and oversight to assist in the identification of plants and to ensure that potential impacts to native or sensitive plant species on the floodplain are minimized. Areas treated during the initial effort (late summer/fall of 2000) were flagged in the field for future monitoring purposes. Monitoring of the project area will be conducted during the summer of 2001 to assess the success of the initial effort and determine the need for action in the late summer/fall of 2001. Future treatment and monitoring recommendations for the North Central Floodplain project area will be developed and based on an adaptive management approach and will be modified as necessary based on observed successes and failures.

- Inventory the stream crossing for light infantry training on Sideling Hill Creek to determine the current extent of microstegium in the area. Data gathered in the 1996 inventory conducted by the USGS should be used, where possible, to determine recent historic presence of microstegium at the stream crossing. This data can be compared with the current inventory to determine recent spread of microstegium. Mechanically remove microstegium from the stream crossing area and in an area 150 feet upstream and downstream of the crossing on both banks of Sideling Hill Creek. The microstegium will be mechanically removed after it has flowered, but before its seeds become viable (August to October) to ensure that new seed stock associated with plant removal is not supplied to the soil. Removal of the microstegium will be conducted under the supervision of a botanist to ensure that sensitive or protected plant species that may be present within or adjacent to the microstegium populations are not adversely impacted. (This management measure is also presented in Section 5.5.3.1)
  
- Use a bush hog or weed eaters to manage microstegium occurring on the roadway approach to Sideling Hill Creek on both sides of the stream crossing for light infantry training. Mow after the microstegium has flowered, but before its seeds become viable. Mowing will be required on a yearly basis for up to seven years due to the long seed bank viability of microstegium. Remove pioneer plants in the adjacent woods and those occurring in the creek bed by hand. Conduct yearly monitoring of microstegium in and adjacent to the roadway to determine if mowing effectively contains the spread, or over time reduces the extent, of the species. If it is determined that mowing does not effectively control microstegium in the roadway at the crossing, management will be adapted and other methods for controlling the species will be evaluated and implemented for control. Continued yearly monitoring will be used to evaluate the success of the control efforts and determine if further modifications are necessary. (This management measure is also presented in Section 5.5.3.1)
  
- Monitor the approach to the stream crossing on both sides of Sideling Hill Creek to determine if using the crossing is resulting in the spread of microstegium along and adjacent to the training trails. Address any spread of microstegium associated with the stream crossing in a timely manner to ensure that spread of the species is minimized. Mechanical removal of the grass should be conducted after the plant has set flower but before the seeds become viable. Monitoring of the stream crossing and adjacent area should be conducted several times throughout the growing season so that any new spread of the species associated with the use of the stream crossing will be detected. Continue to mechanically remove microstegium from the stream crossing area and in the area 150 feet along and inland from the streambank upstream and downstream of the crossing along with any new spread of the grass associated with use of the crossing on an annual basis. Continue to monitor the stream crossing and adjacent areas for the spread of microstegium several times throughout the growing season on an annual basis. (This management measure is also presented in Section 5.5.3.1)
  
- Hand pull garlic mustard occurring at the Sideling Hill Creek crossing for light infantry and in the area 150 feet along and inland from the streambank upstream and

downstream from the crossing. Monitor the area on an annual basis for the reoccurrence of garlic mustard and to determine if use of the crossing is resulting in the spread of garlic mustard. Hand pull garlic mustard occurring in the area on an annual basis. Removal of garlic mustard from the crossing area should be conducted in May-June. Plants that are pulled after flowering has occurred should be bagged and removed from the site. (This management measure is also presented in Section 5.5.3.1)

- Mechanically remove yellow day lily from the floodplain areas 150 feet upstream and downstream of the Sideling Hill Creek crossing for light infantry. Pitchforks or other similar tools should be used for removal to ensure the bulbs of the day lily are also removed. Plants should be bagged and removed from the site following their removal. Monitor the area on an annual basis for the occurrence of yellow day lily and remove plants that reoccur. (This management measure is also presented in Section 5.5.3.1)
- Remove bush honeysuckle on the west side of Sideling Hill Creek along the road approaching the crossing for light infantry. A well-established population of bush honeysuckle occurs in an approximately one acre area along the road. Assess the extent of the bush honeysuckle population and direct initial efforts for removal of plants occurring in the woods around the parameter of the main population. Mechanical methods should be implemented for removal of bush honeysuckle from the area. Monitor on an annual basis to determine the success of management and remove any plants that become reestablished in the area. Monitoring should be conducted in early spring because early leaf out of the plant makes its identification easier at this time of year. (This management measure is also presented in Section 5.5.3.1)
- Remove bush honeysuckle from the North Central Floodplain. Bush honeysuckle occurs sparsely as individual plants on the floodplain based on observations made during a preliminary site assessment conducted in the spring of 2000. The population is incipient and could be controlled with limited effort, if addressed in a timely manner. Remove shrubs mechanically or by hand pulling.
- Hand pull or mechanically remove spotted knapweed from the Boy Scout Barren along Allegany County Line Road. Conduct removal of spotted knapweed along the road on the barren on an annual basis.
- Mechanically remove Japanese barberry and multiflora rose from the wooded area between the water supply pond and the access road.
- Mechanically remove Japanese barberry from the wooded area adjacent to Ziegler Road to the west of the main entrance.
- Reassess (year 2001) the extent of, and mechanically remove garlic mustard from the wooded area adjacent to Ziegler Road along the unnamed tributary to Sideling Hill Creek in the vicinity of the main entrance to TBBTF.

- Remove multiflora rose in the Lower Sideling Hill Creek Floodplain along the power line/fire break to Tabler Lodge. Heavy equipment (backhoe) is recommended to knock down the large rose clumps. The multiflora rose should be removed from the site after it is pulled so that new seed stock is not supplied to the area from the pulled shrubs. Follow up monitoring and treatment of the area will be necessary due to resprouting and because seeds will be spread and germinate readily on the disturbed soil. Equipment used to knock down and remove multiflora rose from the power line/fire break will operate from the existing access road and the fire break in order to avoid potential impacts to wetlands that occur in the wooded area just to the east of the project site.
- Hand pull or mechanically remove young multiflora rose bushes from the Lower Sideling Hill Creek Floodplain in the meadow to the east and wooded area to the west of the power line/fire break to Tabler Lodge. A large number of young shrubs have established in the area and will develop into dense impassible growths if they are not removed in the near future.
- Mechanically remove microstegium from the access road adjacent to the entrance to Straus Lodge. Monitor the area on an annual basis to ensure that removal of the grass was successful and to direct additional management efforts, if necessary.
- Assess the extent and potential for the removal of microstegium from areas where it occurs on the Big Pool Face and Vicinity and the area just upstream of the Big Pool on the left bank of Sideling Hill Creek. Initial efforts to manage microstegium in the area should concentrate on removing the grass from areas where it is spreading upslope into adjacent woods.
- Assess the extent of microstegium occurring along and in the woods adjacent to the unnamed tributary between the water supply pond and Sideling Hill Creek. This area includes sections of the North Ridge sensitive area. Evaluate the potential for control of the spread of microstegium in the area. If it is determined to be feasible, develop a plan for control and removal of the grass from along the tributary.
- Assess the extent and potential for the removal of bush honeysuckle, multiflora rose and Japanese honeysuckle from along and adjacent to Allegany County Line Road to the north of the Boy Scout Barren near the northern boundary of TBBTF. The extent of the exotic invasives should be assessed to determine their potential for future management and control in the area.
- Assess the extent and potential for removal of barren brome from along and adjacent to Allegany County Line Road to the north of the Boy Scout Barren near the northern boundary of TBBTF. The extent of the exotic grass should be assessed to determine its potential for future management and control in the area.
- Consider using volunteer groups to help remove and manage exotic invasive plant species on TBBTF. Participation in the management of invasive plant species on the facility could be a useful learning tool for volunteers and would benefit the natural

resources program at TBBTF. This would enable volunteers interested in invasive species management to become involved and gain first hand experience in an ongoing management program. In addition, involving volunteers in the management program at TBBTF could serve as a useful resource for management approaches based on past successes or failures experienced both at the facility and by the participating volunteers.

- Look into the possibility of using interested high school students from Allegany and Washington Counties for invasive plant species identification and removal projects on TBBTF as a part of their community service hours (student service learning hours) required for graduation. This would serve as a valuable learning experience for students and teachers, provide first hand experience to students in natural resources management, increase public awareness of ongoing MDARNG efforts to manage and maintain healthy ecosystems on their facilities, and benefit the overall natural resources program at TBBTF.

### **5.13.2 Other Management Measures Considered**

More intensive pest management measures were considered but rejected because there currently is not a major pest problem on TBBTF. A more intensive approach to exotic invasive plant species management involving increased use of herbicides and a more intense initial effort for the removal of microstegium from the facility was also considered. This approach to invasive plant species management on the facility was rejected because it is not consistent with efforts to minimize the use of herbicides on TBBTF. A intense initial effort to remove microstegium from TBBTF was also rejected because it is not consistent with accepted approaches to invasive species control which base priority for management on the extent of populations, their rate of growth, their potential for control, the current and potential impact of the species on existing natural ecosystems and their potential adverse effect on sensitive habitats or species. The current approach to management of microstegium on TBBTF is based on a consideration of these factors in order to determine the most feasible, economic and effective manner to manage microstegium on the facility.

## **5.14 FIRE MANAGEMENT**

There is no installation fire department on TBBTF. Fire support from the Orleans Fire Department is used if necessary to control or extinguish fires on TBBTF. In the event of a fire in any building or the woods, users of the facility are instructed to immediately evacuate the area and notify the Site Manager, or if not available, to call 911. Safety procedures to be followed in case of a fire are posted in buildings on the clearing checklists.

Training units or other facility users are required to attend fire prevention orientation prior to use of any training facilities. Open fires are prohibited in all training areas and campfires are only allowed in designated areas in constructed fire ring structures. Smoking or open flames are prohibited within 50 feet of ammunition, petroleum, or paint

storage areas and written approval from Headquarters STARC is required for the use of pyrotechnics, tracer ammunition, or projectiles.

If a fire occurs during training operations it is the responsibility of the Officer in Command to insure that all personnel take immediate steps to extinguish the fire with the means at hand. If it is determined to be necessary, fire support from the Orleans Fire Department will be called in. If the fire department is called in, command for fighting the fire will be turned over to the senior fire department official onsite.

There is one firebreak on TBBTF that follows the power break up to the Straus Lodge. Vegetation on the firebreak is maintained by mowing. Roads and power line cuts maintained by the Site Manager on TBBTF also serve as firebreaks.

There currently is no prescribed bum program on TBBTF. Fire is usually an important ecological factor in the maintenance of healthy terrestrial ecosystems. The intensity, duration, frequency, and time of year that burning takes place along with soil, water, vegetative and other ecological characteristics are important factors to evaluate when considering the use of prescribed bums or allowing wildfires to bum out naturally. It is important to determine whether fire plays a role in the maintenance of a healthy ecological ecosystem based on a sites characteristics. For example, natural fires may not play a role in healthy ecosystem maintenance in certain types of shale barrens. Improper use of prescribed bums can result in the spread of invasive species at the expense of natural vegetation, or in the case of certain shale barrens, result in loss of vegetation over extended periods of time due to poor soil conditions, unstable slopes and limited seed supply. A properly developed and implemented prescribed bum program can also reduce the potential for wildfires and enhance terrestrial and shale barren habitat by killing or suppressing the spread of invasive species and improving overall soil conditions. Two recent (early 1990s) fires have occurred on TBBTF. The past bum sites, located on the Carex Fire Slope (see Figure 3-5) and on the upper Straus Barren adjacent to the access road to the southwest of Straus Lodge, provide areas where the effects of fires in two varying ecosystems on TBBTF can be evaluated. Monitoring of the two bum areas could be useful in evaluating the viability of considering the application of prescribed bums on TBBTF in the future.

#### **5.14.1 Management Measures**

The following measures for fire management will be implemented on TBBTF:

- Personnel making use of the land on TBBTF will monitor and be aware of fire hazards and adjust their programs, including the suspension of activities if necessary, to avoid high hazard areas and/or periods.
- Minimize the potential for the occurrence of brush and forest fires on TBBTF by restricting activities, spatially or seasonally, that present potential for fire hazards.
- Conduct annual monitoring and track plant species succession on the Carex Fire Slope (see Figure 3-5). Use the results of monitoring to detennine the viability of

using prescribed burning in the future to maintain healthy terrestrial ecosystems on TBBTF and reduce the potential for wildfires. Compare current vegetation on the Carex Fire Slope with similar adjacent unburned habitats to establish a general characterization of plant reestablishment and succession from the occurrence of the fire (1993) until present.

- Conduct annual monitoring and track plant species succession on the Upper Straus Barren Bum Area (burned in the early 1990s). Use the data from monitoring to determine the viability of using prescribed burns in the future to maintain healthy shale barren ecosystems on barrens with similar characteristics to the Straus Barren. Compare current vegetation on the bum site to vegetation on similar unburned areas of the Straus Barren to establish a general characterization of plant succession from the time of the fire till present.

#### **5.14.2 Other Management Measures Considered**

Other management alternatives considered for fire management on TBBTF included increasing the number of firebreaks and using prescribed burns to reduce the threat of wildfire by reducing combustible fuel accumulations in the understory.

Increasing the number of firebreaks was determined to not be feasible because it would reduce the facility's capability to support training as a state-of-the-art land navigation facility. An increased number of firebreaks would also greatly increase the potential for erosion and sedimentation on the facility due to the presence of steep to very steep slopes and highly erodible soils across TBBTF (see Table 3-3). Opening up additional firebreaks on TBBTF would also increase the potential for the spread of invasive species currently present, or that could become established, on TBBTF as a result of disturbance associated with the construction of the firebreaks.

Although prescribed burning could be a useful tool to minimize the risk of wildfire, enhance wildlife habitat, and improve biodiversity, it was considered to not be currently feasible due to the size of the facility, access, and the presence of sensitive species and habitats on TBBTF. Current lack of knowledge of the effect of fire on the shale barren ecosystems on TBBTF precludes the use of fire as a management tool at the present time.

### **5.15 INTEGRATION AND SUMMARY OF MANAGEMENT MEASURES**

The overlap of similar management measures or the application of the same management measures for different resource areas reflects the similarities and the interrelationships between the various ecosystems and their components on TBBTF. The need for integration of natural resources management on TBBTF is driven by these interrelationships. For example, the conditions of the forests on TBBTF directly influence the quality of wildlife habitats and the condition and diversity of the fauna that utilize the habitats. The condition of the forests and vegetative communities in general also directly effect water quality, the condition of the fisheries and sensitive habitats such as wetlands and floodplain communities. These habitats, as well as others occurring on



TBBTF, provide the biodiversity necessary to support a rich diversity of wildlife. Management and control of erosion on TBBTF decreases sediment loads to water bodies resulting in the maintenance or enhancement of aquatic habitats and the species that inhabit them. Management and control of exotic invasive plant species enhances and restores the diversity of natural vegetative communities improving the quality and diversity of habitats and the species that inhabit them and ultimately the ability to train in natural and realistic conditions over time. Conversely, the lack of a comprehensive and integrated approach to natural resources management on TBBTF could over time result in degraded habitat conditions, and a loss of ecological integrity and biodiversity ultimately adversely affecting the ability to train in natural conditions over time.

Table 5-1 presents the management measures and monitoring for the Sideling Hill Creek crossing for light infantry training. Management measures presented in Table 5-1 also appear under the management measures for riparian areas on TBBTF.

**Table 5-1**

**Management Measures and Monitoring for the Sideling Hill Creek Crossing for Light Infantry Training**

- Inventory the stream crossing for light infantry training on Sideling Hill Creek to determine the current extent of microstegium (*Microstegium vimineum*) in the area. Data gathered in the 1996 inventory conducted by the USGS should be used, where possible, to determine recent historic presence of microstegium at the stream crossing. These data can be compared with the current inventory to determine recent spread of microstegium. Mechanically remove microstegium from the stream crossing area and in an area 150 feet upstream and downstream of the crossing on both banks of Sideling Hill Creek. The microstegium will be mechanically removed after it has flowered, but before its seeds become viable (August to October) to ensure that new seed stock associated with plant removal is not supplied to the soil. Removal of the microstegium will be conducted under the supervision of a botanist to ensure that sensitive or protected plant species that may be present within or adjacent to the microstegium populations are not adversely impacted.
- Use a bush hog or weedeater to manage microstegium occurring on the roadway approach to Sideling Hill Creek on both sides of the stream crossing for light infantry training. Mowing will be conducted after the microstegium has flowered, but before its seeds become viable. Mowing will be required on a yearly basis for up to seven years due to the long seedbank viability of microstegium. Remove pioneer plants in the adjacent woods and those occurring in the creek bed by hand. Yearly monitoring of microstegium in, and adjacent to, the roadway will be conducted to determine if mowing effectively contains the spread, or over time reduces the extent, of the species. If it is determined that mowing does not effectively control microstegium in the roadway at the crossing, management will be adapted and other methods for controlling the species will be evaluated and implemented for control. Continued yearly monitoring will be used to evaluate the success of the control efforts and determine if further modifications are necessary.
- Monitor the approach to the stream crossing on both sides of Sideling Hill Creek to determine if using the crossing is resulting in the spread of microstegium along and adjacent to the training trails. Any spread of microstegium associated with the stream crossing will be addressed in a timely manner to ensure that spread of the species is

minimized. Mechanical removal of the grass should be conducted after the plant has set flower but before the seeds become viable. Monitoring of the stream crossing and adjacent area should be conducted several times throughout the growing season so that any new spread of the species associated with the use of the stream crossing will be detected. Continue to mechanically remove microstegium from the stream crossing area and in the area 150 feet along and inland from the streambank upstream and downstream of the crossing along with any new spread of the grass associated with use of the crossing on an annual basis. Continue to monitor the stream crossing and adjacent areas for the spread of microstegium several times throughout the growing season on an annual basis.

- Hand pull garlic mustard occurring at the Sideling Hill Creek crossing for light infantry and in the area 150 feet along and inland from the streambank upstream and downstream from the crossing. Monitor the area on an annual basis for the reoccurrence of garlic mustard and to determine if use of the crossing is resulting in the spread of garlic mustard. Hand pull garlic mustard occurring in the area on an annual basis. Removal of garlic mustard from the crossing area should be conducted in May-June. Plants that are pulled after flowering has occurred should be bagged and removed from the site.
- Mechanically remove yellow day lily from the floodplain areas 150 feet upstream and downstream of the Sideling Hill Creek crossing for light infantry. Pitchforks or other similar tools should be used for removal to ensure the bulbs of the day lily are also removed. Plants should be bagged and removed from the site following their removal. Monitor the area on an annual basis for the occurrence of yellow day lily and remove plants that reoccur.
- Remove bush honeysuckle on the west side of Sideling Hill Creek along the road approaching the crossing for light infantry. A well-established population of bush honeysuckle occurs in an approximately one acre area along the road. Assess the extent of the bush honeysuckle population and direct initial efforts for removal on plants occurring in the woods around the parameter of the main population. Mechanical methods should be implemented for removal of bush honeysuckle from the area. Monitor on an annual basis to determine the success of management and remove any plants that become reestablished in the area. Monitoring should be conducted in early spring because early leaf out of the plant makes its identification easier at this time of year.
- The use of the Sideling Hill Creek crossing will be limited to light infantry foot traffic during training activities. No vehicles or machinery will use the Sideling Hill Creek crossing for transportation or for any other reason except for in response to actual emergencies.
- Monitor and maintain the stream crossing for light infantry to ensure that streambank erosion and associated water quality and aquatic habitat impacts do not occur as a result of using the crossing. Apply environmentally compatible best management practices, if necessary, to minimize streambank, water quality, and aquatic habitat degradation at the crossing.

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## **6.0 - IMPLEMENTATION**

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## **6.0 IMPLEMENTATION**

Implementation of this INRMP is the final step in the planning process. Implementation marks the end of planning and the beginning of action. Proper management of the natural resources on TBBTF will ensure that the goals and objectives presented in the INRMP will be accomplished.

### **6.1 ORGANIZATION, ROLES, AND RESPONSIBILITIES**

Implementation of the management measures prescribed in the INRMP for the management of natural resources on TBBTF will require assistance from off site. During the plan period, 2001-2005, cooperation and coordination both within the MDARNG and with outside agencies will be needed to implement the plan. This provides opportunities to enhance and strengthen existing professional relationships and partnerships and benefits the overall natural resources management program on the facility.

### **6.2 STAFFING**

Successful implementation of the INRMP on TBBTF relies on a balanced team of trained professionals and technical staff. Staffing sources for the natural resources program at TBBTF include:

- **Permanent staff.** The site manager is the only permanent staff at TBBTF.
- **Part-time staff.** There is no permanent part-time staff at TBBTF.
- **Troop labor.** Troop labor during annual and drill training can provide benefits to the training site as well as to the troops themselves. An example of where troops could execute projects or tasks associated with natural resources management on TBBTF is the location and eradication of exotic invasive plant species on the facility (see Section 5.13). Coordination with, and guidance from, personnel knowledgeable in exotic invasive species management and control and in the identification of sensitive plant species on the facility would be necessary to ensure proper implementation of management efforts.
- **Special contractors.** Many of the state-funded projects on TBBTF will require independent contractors. Potential contractors include: The U.S. Army Corps of Engineers; The Maryland Chapter of The Nature Conservancy; The Natural Resources Conservation Service; Frostburg State University; and other contractors who have conducted past natural resources work on TBBTF.
- **Civic groups.** The Boy Scouts, Girl Scouts, and other groups such as Challenge Program youths.
- **Volunteers.** Maryland Native Plant Society and others.

### **6.2.1 Outside Assistance and Training**

Cooperation and coordination both within the MDARNG and with external agencies is needed for successful implementation of the plan. Implementation of a number of the management measures or projects discussed in the INRMP will require active outside assistance. The outside assistance, discussed in Section 1.0 and 5.0, will come from state and Federal agencies, universities and contractors. Use of these resources is the most cost effective and efficient method for acquiring expertise on a temporary basis.

Training received by TBBTF personnel and others participating in the management of natural resources at the facility should address current scientific and professional standards as related to the conservation of natural resources, practical job oriented information, legal compliance requirements, applicable DoD regulations, and pertinent state and local laws.

### **6.3 PROJECT/PROGRAM PRIORITIES**

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP and the associated NEPA analysis and documentation to be a high priority. However, not all of the projects and programs identified in the INRMP will receive immediate funding. For this reason, the projects and programs have been categorized as 1) high priority projects and 2) important projects. Prioritization of projects is based on need, and need is based on a project's importance in moving the natural resources management program closer to achieving its goals. Placement of a project in the high priority category does not, however, guarantee it's funding. Management measures and projects prescribed in the INRMP, their priority category, and the time frames for their implementation are included in Table 6-1. High priority projects are listed first, followed by the important projects. Management measures presented in Table 6-1, for the most part, are represented by resource group (i.e., soil resource management measures, water resource management measures, etc.). Appendix E provides a complete list of the management measures prescribed in the INRMP with time frames for their implementation.

It is understood that congressional budget constraints will require increased implementation by in-house staff and that permanent onsite staff on TBBTF is limited to the Site Manager. It is assumed that a large amount of the professional work required by the plan will be accomplished by contract; through partnerships, including borrowed labor; with universities and other public research institutions; and by limited term, part time employees.

### **6.4 IMPLEMENTATION OF FUNDING OPTIONS**

Financial support for the natural resources program at TBBTF is limited to federally appropriated funds. User fees for activities such as hunting and fishing are not collected at TBBTF. Hunting is not permitted on the facility to the west of Sideling Hill Creek. Hunting on the east side of Sideling Hill Creek and fishing in the creek is managed by

MDDNR. Installation pennits are not required, and as a result, TBBTF does not generate fish and wildlife funds from permit fees.

**Table 6-1**

**Priority and Implementation Time Frames for Management Measures and Projects Prescribed in the INRMP**

<b>Management Measure/Project</b>	<b>Time Frame</b>
<b>High Priority Projects</b>	
Implement the management measures for the Sideling Hill Creek crossing for light infantry training (see Table 5-1).	FY 01-05
Continue to implement use and activity restrictions in the RUA and the 100-meter buffer to Sideling Hill Creek.	FY 01-05
Implement the soil resources management measures.	FY 01-05
Implement the water resources management measures.	FY 01-05
Implement the wetland and vernal pool management measures.	FY 01-05
Implement the riparian area management measures.	FY 01-05
Implement the aquatic habitats management measures.	FY 01-05
Implement the terrestrial habitats management measures.	FY 01-05
Implement the sensitive and significant habitat management measures.	FY 01-05
Implement the wildlife management measures.	FY 01-05
Implement the fisheries management measures.	FY 01-05
Implement management measures to protect rare, threatened, and endangered species on TBBTF.	FY 01-05
Protect cultural resources by implementing measures to ensure that they are not adversely affected if they are found on TBBTF.	FY 01-05
Implement pest and exotic and invasive plant species management measures.	FY 01-05
Control exotic and invasive plant species to the maximum extent feasible. Base prioritization for management of invasives on their degree of establishment, their rate of growth or spread, the current and potential impact of the species on existing natural ecosystems and their potential adverse effects on sensitive habitats or species.	FY 01-054
Implement fire prevention management measures.	FY01-05
<b>Important Projects</b>	
Evaluate the viability of installing nest boxes for target species on TBBTF. Install and monitor boxes if it is determined to be feasible.	FY 01-05
Survey the fish populations in the water supply pond.	FY01
Monitor habitats and condition of state listed rare, threatened or endangered species on TBBTF.	FY 01-05

Management Measure/Project	Time Frame
Conduct annual monitoring and track plant species succession on the Carex Fire Slope.	FY 01-05
Conduct annual monitoring and track plant species succession on the Upper Straus Barren Bum Area.	FY 01-05
Note: See Appendix E for a complete list of the management measures and time frames for their implementation	

The forestry program at TBBTF consists of allowing the forested areas to follow the natural course of ecological succession. Forestry funds have not been proposed or committed for management activities at the facility because the forests are not actively managed.

#### 6.4.1 Funding Options

The National Guard Bureau is the primary source of funding for natural resources management on TBBTF. Legacy funding through the “Pulling It All Together” and “Public Lands/Day” programs will be used where applicable and available for natural resources management on TBBTF.

#### 6.4.2 INRMP Implementation Costs

The five-year cost for implementing the INRMP is based on a summary of estimated costs for implementing the measures presented in Section 5.0. All implementation costs are rough estimates (based on average salaries, estimated materials, and estimated time to complete the projects) and are subject to change. For example, the costs for projects completed by a contractor, could be much higher due to indirect costs, travel, and equipment. In addition, the full extent of effort necessary to implement some of the management projects presented in the INRMP is not currently known. For example, a complete understanding of the level of effort that will be required to address exotic invasive plant species on the facility has not been determined. This INRMP includes management measures to assess the level of effort needed to manage exotic invasive plants on the facility. Costs for implementing invasive species management initiatives on TBBTF may increase based on results of the assessment.

The cost for implementing the natural resources management projects presented in the INRMP is estimated to be \$39,340 per year. On a per acre basis (TBBTF=1,194 acres), implementation of the plan will cost \$32.94 per acre per year.

### 6.5 COMMAND SUPPORT

The Base Commander and other personnel in command positions at TBBTF fully support this INRMP. The command is dedicated to ensuring the long-term sustainability of the

natural resources and the management of those resources necessary to support the military mission.

Command support is essential for implementation of the INRMP. In accordance with AR 200-3, the Sikes Act and other Federal laws, the commander of TBBTF is personally responsible for compliance with the environmental laws affected by the INRMP and, therefore, has a personal interest in ensuring the full and complete implementation of the plan.

## **6.6 PLAN REVIEW**

This plan will be reviewed annually and revised as mission or environmental changes warrant. The plan will be reviewed in light of the previous year's accomplishments and lessons learned. Major revisions of all sections will be accomplished at least every five years. Information relating to soils, vegetation, and other environmental data not requiring revision should be retained in the updated plan.



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## **7.0 - ENVIRONMENTAL CONSEQUENCES**

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## **7.0 ENVIRONMENTAL CONSEQUENCES**

This section of the document assesses known, potential, and reasonably foreseeable environmental consequences related to implementing the INRMP and managing natural resources at TBBTF. Section 7.1 addresses implementation of the no action alternative, which reflects the continuation of existing baseline conditions as described in Section 3.0. Section 7.2 presents potential effects in the context of the scope of the proposed action and in consideration of the affected environment. This assessment is organized by resource area (as presented in Section 3.0) and considers implementation of the selected management measures in their entirety (as presented in Section 5.0). Cumulative effects are discussed in Section 7.3. Implementing the proposed action is the preferred alternative. A summary of the potential environmental consequences associated with the no action alternative and the proposed action is presented in Section 7.4.

As discussed in Section 1.4.5 (Description of the Proposed Action and Alternatives) the EA addresses two alternatives—the proposed action and the no action alternative. Other management alternatives were considered during the screening process, but eliminated because they were economically infeasible, ecologically unsound, or incompatible with the requirements of the military mission. Section 5.0 (Natural Resources Management), provides a description of the methods used to develop management measures for each resource area and the rationale for why certain management measures were selected. Therefore, the analytical framework supporting the management measures for each resource area is not repeated in this section. This approach supports Army guidance for concurrent preparation and integration of the INRMP and NEPA documentation.

As discussed in Section 1.4.5, the TBBTF INRMP is a living document that focuses on a five-year planning period based on past and present actions. Short-term management practices included in the plan have been developed without compromising long-range goals and objectives. Because the plan will be modified over time, additional environmental analyses might be required as new management measures are developed over the long term (i.e., beyond five years).

### **7.1 NO ACTION ALTERNATIVE**

Adoption of the no action alternative would mean that TBBTF's INRMP would not be implemented and current natural resource management practices at the training facility would continue as is. Existing conditions and management practices presented in Section 3.0 (Affected Environment) would continue and no new initiatives would be established.

Potential consequences associated with the no action alternative are discussed in this section for each resource area described in Section 3.0. Section 7.4 summarizes the analysis of potential consequences for the no action alternative and compares the consequences of the no action alternative to the consequences of the proposed action. As shown, no significant or adverse effects would be expected under the proposed action alternative. Under the no action alternative, the environmental conditions at TBBTF

would not benefit from the management measures associated with implementing the proposed INRMP.

The remainder of this section presents the expected effects of implementing the no action alternative for each of the resource areas.

**Environmental Setting.** Adverse effects to the overall environmental conditions on TBBTF would be expected under the no action alternative. The condition of certain natural resources along with the ability to continue to train in realistic conditions would be adversely affected without implementation of a formal natural resources management plan. For example, exotic invasive plant species present a threat to several natural habitats on the facility. The condition of natural habitats on the TBBTF will continue to be degraded over time without a plan to manage invasive plant species on the facility.

**Climate.** No effects on climate would be expected.

**Air Quality.** No effects would be expected. The major concerns regarding air quality and potential environmental effects pertain to increases in pollutant emissions; exceedances of National Ambient Air Quality Standards and other Federal, state, and local limits; and impacts on existing air permits. Potential effects on existing pollutant emissions are precluded by the fact that current natural resource management actions do not involve any activities that would contribute to changes in existing air quality. Therefore, there would be no effects regarding air quality as a result of implementing the no action alternative.

**Noise.** No effects would be expected. The major concerns regarding noise and potential environmental effects pertain to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance (i.e., noise complaints). Potential effects are precluded by the fact that current natural resource management actions do not involve any activities that would affect noise conditions. Therefore, there would be no effects regarding noise levels or sound quality as a result of implementing the no action alternative.

**Topography.** Minor adverse effects would be expected. Failure to implement a comprehensive soil resource management program would be expected to result in impacts to natural micro topography associated with erosion and sedimentation on TBBTF.

**Geology.** Minor adverse effects would be expected. Failure to implement a comprehensive soil resource management program would be expected to result in impacts on geologic resources associated with erosion and sedimentation on TBBTF.

**Soils.** Minor adverse effects would be expected. Failure to implement a comprehensive soil resource management program would be expected to result in impacts on soils associated with erosion and sedimentation on TBBTF. The no action alternative does not include the implementation of comprehensive soil resource monitoring, conservation measures, or a plan of action to prevent or minimize potential soil problems related to erosion and sedimentation prior to their occurrence. Implementation of the no action

alternative would involve reactive management to problems after their occurrence, rather than managing the resource to prevent impacts or to minimize the extent of unavoidable impacts.

**Water Resources.** Minor adverse effects would be expected. The no action alternative does not provide a formal plan of action for monitoring and protecting the water resources at TBBTF. Water resources on TBBTF are vulnerable to degradation without a management approach that includes monitoring of conditions both in and adjacent to water bodies and proactive efforts to identify and address potential water quality problems at their onset.

**Wetlands and Vernal Pools.** Minor adverse effects would be expected. The no action alternative does not provide a management approach that would evaluate, and monitor wetland and vernal pool habitats; nor does it establish formal protection measures to prevent or minimize potential impacts that could result from training and other mission-related activities.

**Riparian Habitats.** Adverse effects to riparian habitats would be expected to continue. The no action alternative does not provide for the assessment and management of exotic invasive plant species that occur on the riparian areas on TBBTF. Over time, the lack of a formal approach to invasive plant species management on TBBTF will result in continued degradation of habitat functions in the riparian areas. The no action alternative also does not provide management measures specifically developed to ensure that impacts to riparian and associated habitats do not occur as a result of training exercises at the Sideling Hill Creek Crossing for light infantry.

**Aquatic Habitats.** Minor adverse effects would be expected. The no action alternative does not provide for the formal implementation of a routine habitat assessment and monitoring program. Implementation of such a program not only provides a method for protecting these habitats, but also provides a baseline of data that can be used to identify potential problems, prioritize restoration projects and identify the most efficient allocation of resources.

**Terrestrial Habitats.** Minor adverse effects would be expected to continue. Under the no action alternative, there would be no formal plan of action to improve terrestrial habitat conditions and diversity, resulting in a continued challenge for TBBTF to maintain or improve overall biodiversity. Under the no action alternative, there would be no coordinated effort or plan to improve or maintain the quality of habitat required by a diverse population of wildlife. In addition, the no action alternative does not provide for the assessment and management of exotic invasive plant species that occur in terrestrial habitats on TBBTF. Over time, the lack of a formal approach to invasive plant species management on TBBTF will result in continued degradation of habitat functions in terrestrial habitats on the facility.

**Sensitive and Significant Habitats.** Minor adverse effects would be expected. Use restrictions in place for most of the sensitive and significant habitats on TBBTF provide protection by limiting activities that can occur in the areas. However, there is no formal

plan of action to ensure that the quality of these habitats is maintained or enhanced. The no action alternative does not provide for the formal implementation of a routine habitat assessment and monitoring program for any of the habitats. In addition, the no action alternative does not provide for the assessment and management of exotic invasive plant species that occur in or adjacent to many of the habitats. Over time, the lack of a formal approach to invasive plant species management on TBBTF will result in continued degradation of habitat functions in many of the sensitive and significant habitats.

**Fauna.** Minor adverse effects to the fauna on TBBTF would be expected. Under the no action alternative, efforts to enhance the abundance and biodiversity of wildlife on TBBTF would not be implemented. In addition, management measures designed to protect and enhance wildlife habitats (i.e., aquatic, riparian, wetlands, terrestrial) on the facility would not be implemented.

**Flora.** Adverse effects would be expected to continue. Under the no action alternative, the health and condition of plant communities on TBBTF would not be improved, and the measures to manage and control the spread of exotic invasive plant species would not be implemented. The resulting decline in habitat quality and complexity would continue to adversely affect biodiversity.

**Rare, Threatened, and Endangered Species.** Minor adverse impacts to state listed species on TBBTF would be expected to occur. Although MDARNG views protection of state listed species as a matter of responsible stewardship and impacts to the species are avoided, special measures for protection (i.e., erosion control, water quality monitoring and invasive species management) are not provided under the No Action alternative. Adverse impacts to the federally endangered plant harperella (*Ptilimnium viviparuni*) associated with training activities would not be expected to occur under the No Action alternative because MDARNG currently limits activities in the RUA and coordinates with USFWS, MDDNR, and TNC to avoid potential impacts to the plant species.

**Cultural Resources.** No effects to cultural resources at TBBTF would be expected under the no action alternative. However, under the no action alternative there is no formal plan requiring the notification of the Site Manager of discovery and the requirement to take action to protect the integrity of potential cultural resources if they are found.

**Land Use.** No effects would be expected. No changes to onsite land use or land use patterns would occur under the no action alternative. Land use patterns on site are not expected to occur, so land use in the surrounding areas would not be affected.

**Facilities.** No effects would be expected. All facilities and structures would continue to be maintained and operated in accordance with required permits and capabilities of the systems. Under the no action alternative, the demand for utilities and roads would not be expected to change, and therefore would not be adversely affect existing facilities.

**Hazardous and Toxic Materials.** No effects would be expected. All hazardous and toxic materials would continue to be handled in accordance with Federal laws and ARNG

regulations, including the Resource Conservation and Recovery Act, the Federal Insecticide, Fungicide and Rodenticide Act, the Toxic Substance Control Act and AR 200-1.

**Socioeconomic Resources.** No effects would be expected. The no action alternative does not involve any activities that change any existing socioeconomic resources.

**Environmental Justice.** No effects would be expected. Existing conditions would continue under the no action alternative. Concerns regarding environmental justice and potential environmental effects pertain to the occurrence of disproportionately high and adverse consequences to children, minorities or low-income communities. The no action alternative does not create any advantage or disadvantage for any group or individual, and it is not expected to create any adverse human health or environmental effects on children, minorities or low-income populations or communities at or in the area surrounding TBBTF.

**Summary.** Analysis of the no action alternative (baseline conditions) does not identify any serious environmental concerns, but the facility currently does not have an INRMP for the conservation, management, or restoration of its natural resources. This conflicts with TBBTF's need to meet mission requirements and comply with environmental regulations and policies. The absence of a formal INRMP inhibits the facility's ability to adequately engage in future planning initiatives and does not capture benefits associated with identifying and executing comprehensive integrated environmental and natural resources management actions. In addition, without a viable and working INRMP, there is the potential that adverse effects on natural resources may occur over the long term. Therefore, implementation of the no action alternative is not favored.

## 7.2 PROPOSED ACTION (PREFERRED ALTERNATIVE)

Potential consequences associated with the proposed action are discussed in this section for each resource area described in Section 3.0, *Affected Environment*. Section 7.4 summarizes the analysis of potential consequences for the proposed action and compares the consequences of the proposed action to those of the no action alternative. Potential environmental consequences associated with implementing the INRMP would result in either no effects or beneficial effects on the resource areas. Compared to the no action alternative, environmental conditions at TBBTF would improve as a result of implementing the proposed INRMP. Therefore, the proposed action is the preferred alternative.

Expected consequences of the preferred alternative for each resource area are presented in the following paragraphs.

**Environmental Setting.** Beneficial effects would be expected. Implementation of the proposed action would result in an improvement of general environmental conditions on TBBTF. Implementation of the INRMP would benefit many of the natural resources on TBBTF, which would result in an improvement in the overall environmental setting on the facility.

**Climate.** No effects on climate would be expected.

**Air Quality.** No effects on air quality would be expected. The primary concerns regarding air quality and potential environmental effects involve increases in pollutant emissions; exceedance of National Ambient Air Quality Standards and other Federal or state limits; and impacts on existing permits. Implementation of the proposed action would not result in activities that would contribute to changes in existing air quality and therefore, no effects on air quality would occur as a result of implementing the proposed action.

**Noise.** No effects on noise would be expected. The primary concerns regarding potential environmental effects associated with noise pertain to increases in sound levels, exceedances of acceptable land use compatibility guidelines, and changes in public acceptance. Implementation of the proposed action would not result in activities that would contribute to changes in existing noise conditions on TBBTF and therefore, no effects on noise would occur as a result of implementing the proposed action.

**Topography.** Beneficial effects to micro topography would be expected. By implementing a comprehensive soil resource management program, impacts on micro topography associated with erosion and sedimentation would be minimized.

**Geology.** Beneficial effects would be expected. By implementing a comprehensive soil resource management program, impacts on geologic resources associated with erosion and sedimentation would be minimized.

**Soils.** Beneficial effects would be expected. By implementing a comprehensive soil resource management program, impacts on soils associated with erosion and sedimentation would be minimized. In addition, monitoring of soil conditions on the installation to identify potential problem areas, the implementation of conservation measures in areas where exposure of soils is necessary, and (when possible) the avoidance of activities likely to result in erosion would minimize potential impacts on the soil resource and result in a reduction in erosion at TBBTF.

**Water Resources.** Beneficial effects would be expected. The establishment of a water quality monitoring program would result in beneficial effects on water quality by providing a mechanism for early detection of problems. This would allow solutions to problems to be implemented in a timely manner. Limited and proper application of turf management chemicals, fungicides, and insecticides would minimize the potential impacts on water quality associated with the use of these chemicals at TBBTF.

**Wetlands and Vernal Pools.** Beneficial effects would be expected. Implementation of the proposed action would protect wetlands and vernal pools by providing a basis to evaluate and monitor habitat conditions through the development of a wetland database for TBBTF. Maintaining buffers will minimize potential impacts on wetlands and vernal pools associated with adjacent activities. Additional efforts will be made to reduce impacts on wetlands by planning mission activities, when possible, in a manner consistent with wetland and vernal pool protection objectives.



**Aquatic Habitat.** Beneficial effects would be expected. The assessment of aquatic habitats at TBBTF will provide a basis to develop a management program that will both protect and enhance these habitats on the installation. Assessment of aquatic habitats at TBBTF will also provide a baseline that can be used in tracking conditions and trends of these habitats, and will allow management practices to be applied where and when needed. Where impacts on aquatic habitats occur as a result of mission activities, management objectives provide for the timely mitigation of the impacts.

**Terrestrial Ecosystems.** Beneficial effects would be expected. A primary goal of the INRMP is the maintenance of a high level of habitat diversity on TBBTF. Actions prescribed in the INRMP such as preservation of snags and downed woody material to provide potential nesting and foraging sites, the establishment of wildlife habitat using native vegetation, and the management and control of exotic invasive plants will result in an overall improvement of terrestrial habitat conditions for flora and fauna on TBBTF.

**Sensitive and Significant Habitats.** Beneficial effects would be expected. As a part of the proposed action, limited access and use of most of the sensitive and significant habitats on TBBTF will be continued. Implementation of the proposed action will result in minimal impacts occurring as a result of training activities and foot traffic. Protective efforts in the sensitive and significant habitat areas will include management and control of exotic invasive plant species, where necessary, and monitoring for long term changes in species composition.

**Fauna.** Beneficial effects would be expected. Implementation of the proposed action will result in improved habitat conditions for wildlife species on TBBTF.

**Flora.** Beneficial effects would be expected. Implementation of the proposed action will benefit native vegetation on TBBTF through the comprehensive management of exotic invasive plant species on the facility. Limited access and use of sensitive habitat areas will also benefit flora by reducing the potential for adverse impacts associated with excessive foot traffic.

**Endangered, Threatened, and Rare Species.** Beneficial effects would be expected. Protection and monitoring measures prescribed for harperella will minimize the potential for adverse effects to the federally endangered plant species and will help to ensure the viability of populations on TBBTF in the future. Beneficial effects on state endangered, rare and watch list species on TBBTF are also expected. Implementation of the proposed action will provide protection and management for species not protected under the ESA (i.e., Tiger beetle and all rare plants). Rare flora and fauna will be treated with added importance and valued for their contributions to the unique natural heritage of TBBTF.

**Cultural Resources.** Beneficial effects would be expected. The INRMP provides a formal plan requiring the notification of the Site Manager of the discovery of any potential cultural resources and requires action be taken to protect the integrity of such resources. The INRMP directs the Site Manager to take steps to ensure that discovered items are not disturbed while further guidance on the potential historical relevance and proper care of the item(s) is obtained.

**Land Use.** No effects would be expected. No changes to onsite land use or use patterns will occur as a result of implementing the proposed action. Land use patterns on TBBTF are not expected to change so surrounding land use patterns would not be affected.

**Facilities.** Beneficial effects would be expected. All facilities will continue to be maintained and operated in accordance with required permits and capabilities of the systems. Under the proposed action, the demand for utilities and roads will not be expected to increase and therefore will not adversely affect existing facilities or infrastructure. Minor upgrades (i.e., erosion management upgrades) to the existing systems would be anticipated over time, resulting in beneficial effects on the existing infrastructure.

**Hazardous and Toxic Materials.** No effects would be expected. All hazardous and toxic materials will continue to be handled in accordance with Federal laws and ARNG regulations, including the Resource Conservation and Recovery Act, the Federal Insecticide, Fungicide and Rodenticide Act, the Toxic Substance Control Act and AR 200-1.

**Socioeconomic Resources.** No effects would be expected. The primary concern regarding potential environmental effects on socioeconomic resources pertains to changes in population, housing, and economic conditions. The proposed action does not involve any activities that change any existing socioeconomic resources and therefore no effects on the resource would be expected as a result of implementing the proposed action.

**Environmental Justice.** No effects would be expected. Existing conditions will continue under the no action alternative. Concerns regarding environmental justice and potential environmental effects pertain to the occurrence of disproportionately high and adverse consequences to children, minorities or low-income communities. The proposed action does not create any advantage or disadvantage for any group or individual, and it is not expected to create any adverse human health or environmental effects on children, minorities, or low-income populations or communities at or in the area surrounding TBBTF.

**Summary.** The EA findings are consistent with the goals of the natural resources management program to maintain ecosystem viability and ensure the sustainability of desired military training area conditions; to maintain, protect and improve ecological integrity; to protect and enhance biological communities, particularly sensitive, rare, threatened and endangered species; to protect the ecosystems and their components from unacceptable damage or degradation, and to identify and restore degraded habitats. The management measures recommended by the INRMP, if implemented, will directly and positively affect the health and condition of natural resources at TBBTF.

### **7.3 CUMULATIVE EFFECTS**

A cumulative effect is defined as an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other

actions. Cumulative effects can result from individually minor but collectively significant actions taking place locally or regionally over a period of time.

Implementation of the INRMP would result in a comprehensive environmental strategy for TBBTF that represents compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources on the installation; and meets legal and policy requirements consistent with national natural resources management philosophies. Implementation would be expected initially to improve existing environmental conditions at TBBTF, as shown by the potential for beneficial effects in Table 7-1.

Over time, adoption of the proposed action will enable TBBTF to achieve its goal of maintaining ecosystem viability and ensuring sustainability of desired military training area conditions.

No adverse cumulative effects to the ecoregion are expected from implementation of the proposed management measures contained in the INRMP. The planned projects and activities will contribute positively to the sustainability of the region's ecosystems.

#### 7.4 SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

Table 7-1 provides a summary of the potential environmental and cumulative effects associated with the implementation of the INRMP at TBBTF.

**Table 7-1**  
**Summary of Potential Environmental and Cumulative Effects on Resource Areas**  
**Presented in Section 3.0**

Resource Area	Environmental Consequences	
	No Action	Proposed Action
Environmental Setting	Adverse effects	Beneficial effects
Climate	No effects	No effects
Air Quality	No effects	No effects
Noise	No effects	No effects
Topography	Minor adverse effects	Beneficial effects
Geology	Minor adverse effects	Beneficial effects
Soils	Minor adverse effects	Beneficial effects
Water Resources	Minor adverse effects	Beneficial effects
Wetlands/Vernal Pools	Minor adverse effects	Beneficial effects
Riparian Habitats	Adverse effects	Beneficial effects
Aquatic Habitats	Minor adverse effects	Beneficial effects
Terrestrial Habitats	Minor adverse effects	Beneficial effects
Sensitive or Significant Habitats	Minor adverse effects	Beneficial effects

Fauna	Minor adverse effects	Beneficial effects
Flora	Adverse effects	Beneficial effects
Rare, Threatened and Endangered Species	Minor adverse effects	Beneficial effects
Cultural Resources	No effects	Beneficial effects
Land Use	No effect	No effects
Facilities	No effects	Beneficial effects
Hazardous and Toxic Materials	No effects	No effects
Socioeconomic Resources	No effects	No effects
Environmental Justice	No effects	No effects
Cumulative effects	No effects	No effects

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## **8.0 - CONCLUSIONS**

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## **8.0 CONCLUSIONS**

This INRMP demonstrates MDARNG's understanding that sound natural resources management is integral to maintaining military readiness. MDARNG is committed to conserve, protect and enhance the natural resources on TBBTF while ensuring the successful accomplishment of the military mission at the facility. The plan presents practicable measures and recommendations that will ensure minimal impact to the mission at TBBTF while providing for the management and stewardship of natural resources as well as the conservation and enhancement of the ecosystems on the facility. The purpose and objective of the plan is to help guide TBBTF towards achieving natural resources management goals, meeting mission requirements, and complying with environmental policies and regulations. The intent of this INRMP is to guide the natural resources management program on TBBTF from 2001 through 2005 and beyond.

MDARNG understands the need to manage TBBTF to preserve and enhance its carrying capacity. The INRMP will allow TBBTF to achieve its goals to ensure sustainability of military training areas necessary to implement the military mission while maintaining ecosystem viability. In addition, the INRMP ensures that natural resources conservation measures and MDARNG activities on TBBTF are integrated and consistent with Federal stewardship requirements. The INRMP focuses on the implementation of goals, objectives and guidelines for sound natural resources management based on an ecosystem management approach, while demonstrating the interrelationships between the military mission and natural resources management. This INRMP supports the military mission at TBBTF, while ensuring sound land management, and compliance with all relevant regulations.

Implementation of the management measures will maintain, protect, and enhance the ecological integrity on the training areas and the biological communities inhabiting them. In addition, the management measures developed in the plan will protect TBBTF ecosystems from unacceptable damage or degradation and identify and restore previously degraded habitats.

This plan also contains the necessary documentation for compliance with the NEP A, which requires Federal agencies consider the environmental consequences of major proposed actions. In the form of an EA, the NEPA documentation analyses the potential effects of the proposed action to implement the facility INRMP. This INRMP ensures that environmental considerations are integral to the mission and comply with AR 200-2 and AR 200-3 by integrating the INRMP and NEPA compliance documentation.

The scope of the EA analysis is based on identifying, documenting, and evaluating potential effects of implementing the INRMP. The proposed action to implement the INRMP for TBBTF was analyzed by comparing potential environmental consequences against existing conditions. Based on the environmental analysis, no significant effects would result from implementing the INRMP. Additionally, no adverse- effects would be expected. Potential consequences of implementing the INRMP would result in beneficial effects or no effects on the individual resource areas. In addition, no significant

cumulative effects would be expected as a result of implementing the INRMP. Because no significant effects would result from implementation of the INRMP the preparation of an EIS is not required, and preparation of a Finding of No Significant Impact is appropriate.

This INRMP is intended to direct natural resources management at TBBTF over the next five years. Command support is essential for the implementation of this INRMP and is required for many of the natural resources management projects presented.

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## **GLOSSARY**

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## **1.0 GLOSSARY**

**Abatement:** Reducing the degree or intensity of, or eliminating, pollution.

**Adaptive Management:** A type of natural resource management that implies making decisions as part of an on-going process. Monitoring the results of actions will provide a flow of information that may indicate the need to change a course of action. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information.

**Affected Environment:** The existing environment to be affected by a proposed action and alternatives.

**Air Quality Standards:** The level of pollutants prescribed by regulations that are not being exceeded during a given time in a defined area.

**Air Quality Criteria:** The levels of pollution and lengths of exposure above which adverse health and welfare effects may occur.

**Ambient Air:** Any unconfined portion of the atmosphere: open air, surrounding air.

**Anthropogenic:** Referring to alterations in the environment due to the presence or activities of humans.

**Anticline:** An upward-curving (convex) fold in rock that resembles an arch. The central part contains the oldest section of rock.

**Aquifer:** A water-bearing stratum of permeable rock, sand, or gravel.

**Aspect:** The compass direction toward which a slope faces, measured in degrees from North in a clockwise direction.

**Attainment Area:** An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

**Barren:** Rugged land that is devoid of significant vegetation compared to adjacent areas because of environmental factors such as adverse climate; poor soil, or wind.

**Best Management Practices:** Methods that have been determined to be the most effective, practical means of preventing or reducing pollution or other adverse environmental impacts.

**Biocontrol:** The control of insect pests and diseases through the use of a living organism (e.g., viruses, parasitic wasps, and mice).

**Biological Diversity:** Refers to the variety and variability among living organisms and the ecological complexes in which they occur. Diversity can be defined as the number of different items and their relative frequencies. For biological diversity, these items are organized at many

levels, ranging from complete ecosystems to the biochemical structures that are the molecular basis of heredity. Thus, the term encompasses different ecosystems, species, and genes.

**Biotic Environment:** A naturally occurring assemblage of plants and animals that live in the same environment and are mutually sustaining and interdependent.

**Bivalve Species:** Having two shells or valves which open and shut, as the oyster and certain seed vessels.

**Buffer:** Strips of grass or other close-growing vegetation that separate a waterway (ditch, stream, creek) from an adjacent land use. Also refers to a designated set back from a water body or other sensitive habitat.

**Carrying Capacity:** The limiting size of a given population that can be supported by an ecosystem over a period of time and under a given set of environmental conditions.

**Clean Air Act (CAA) (42U.S.C.§§7401-7671g):** The comprehensive Federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

**Clean Water Act (CWA) (33 U.S.C. 1251 et seq.):** Amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States.

**Climate:** The meteorological conditions, including temperature, precipitation, and wind that characteristically prevail in a particular region.

**Conglomerate:** A sedimentary rock made of rock fragments, such as pebbles, cobbles, and boulders, in a finer-grained matrix. To call the rock a conglomerate, some of the constituent pebbles must be at least 2 mm (about 1/13th of an inch) across.

**Conservation Easement:** An easement restricting a landowner to land uses that are compatible with long-term conservation and environmental values.

**Council on Environmental Quality (CEQ):** Established by Congress within the Executive Office of the President with passage of the National Environmental Policy Act of 1969. CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

**Cowardin Classification System:** A comprehensive classification system of wetlands and deepwater habitats developed for the U.S. Fish and Wildlife Service.

**Criteria Pollutants:** The 1970 amendments to the Clean Air Act requiring EPA to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide. The term, "criteria pollutants" derives from the requirement that EPA must describe the

characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

**Critical Habitat:** (Endangered Species Act, Section 4). The specific areas within the geographical area occupied by the species, when it is listed, which contain the physical or biological features 1) essential to the conservation of the species and 2) which may require special management considerations or protection. Critical habitat may also include specific areas outside the geographical area occupied by the species when it is listed if those areas are essential for the conservation of the species (ESA Section 3(5A)). Critical habitat is described and designated by the lead Federal regulatory agency making status determinations for a species. Designations usually accompany final listing decisions, but may be delayed to allow comprehensive review of the necessary technical data.

**Cultural Resources:** Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason.

**Cumulative Impacts:** Under NEP A regulations, the incremental environmental impact or effect of an action together with the effects of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR 1508.7).

**Downcutting:** The erosional process by which a stream cuts its bed down towards base level.

**Ecosystem:** The interacting synergism of all living organisms in a particular environment; every plant, insect, aquatic animal, bird, or land species that forms a complex web of interdependency.

**Edge Habitat:** A loosely defined type of habitat that occurs at the boundary between two different habitat types. Typically, edge habitats share characteristics with both adjacent habitat types and have particular transitional characteristics that are important to wildlife.

**Emergent:** A rooted plant growing in shallow water, with part of its stem and leaves above the water surface.

**Endangered Species:** "...any species (including subspecies or qualifying distinct population segment) that is in danger of extinction throughout all or a significant portion of its range." (ESA Section 3(6)). The lead federal agency for the listing of a species as endangered is responsible for reviewing the status of the species on a five-year basis.

**Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.):** An Act to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and to provide a program for the conservation of such endangered species and threatened species.

**Environmental Assessment (EA):** An environmental analysis prepared pursuant to the National Environmental Policy Act to determine whether a Federal action would significantly affect the environment and thus require a more detailed environmental impact statement (EIS).

**Environmental Impact Statement (EIS):** The most detailed and comprehensive environmental analysis specified under the National Environmental Policy Act. An EIS focuses on significant environmental impacts of a proposed action and/or alternatives, including short-term and long-term effects.

**Environmental Justice:** The equal protection from environmental hazards for individuals, groups, or communities regardless of race, ethnicity, or economic status. This applies to the development, implementation, and enforcement of environmental laws, regulations, and policies, and implies that no population of people should be forced to shoulder a disproportionate share of negative environmental impacts of pollution or environmental hazard due to a lack of political or economic strength levels.

**Ephemeral:** Lasting for a short time.

**Erosion:** The wearing away of land surface by wind or water.

**Escarpment:** A relatively continuous cliff or relatively steep slope, produced by erosion or faulting, breaking the general continuity of more gently sloping land surfaces. The term is most commonly applied to cliffs produced by differential erosion.

**Exotic Species:** Nonindigenous species that humans intentionally or unintentionally introduce into an area outside of the species natural range.

**Exotic Invasive Species:** Nonindigenous species that humans intentionally or unintentionally introduce into an area outside of the species natural range that proliferate, spread, and persist to the detriment of native species and ecosystems.

**Farmland Protection Policy Act (FPPA)(7 U.S.C. §§4201 et seq.):** An Act to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that will be compatible with state, local government, and private programs and policies protecting farmland.

**Fault:** A surface or zone of rock fracture along which there has been displacement.

**Fauna:** Animals, especially the animals of a particular region or period, considered as a group.

**Finding of No Significant Impact (FNSI):** A document prepared by a Federal agency showing why a proposed action would not have a significant impact on the environment and thus would not require preparation of an Environmental Impact Statement. A FNSI is based on the results of an Environmental Assessment.

**Firebreak:** A space cleared of flammable material to stop and/or check creeping or running fires or any natural or constructed barrier utilized to segregate, stop, and control the spread of fire or to provide a control line from which to work.

**Floodplain:** The flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood.

**Flora:** Plants considered as a group, especially the plants of a particular country, region, or time.

**Gradient:** The rate of increase or decrease of a variable magnitude, or the curve that represents it.

**Groundwater:** Water found beneath the earth's surface where all empty space in the rock is completely filled with water.

**Habitat:** The place where a population (e.g., human, animal, plant, microorganism) lives and its surroundings, both living and non-living.

**Habitat Fragmentation:** The alteration of a large habitat patch to create isolated or tenuously connected patches of the original habitat that are interspersed with an extensive mosaic of other habitat types.

**Hazardous Waste:** By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special EP A lists.

**Herbaceous:** Relating to or characteristic of an herb as distinguished from a woody plant.

**Hydric Soils:** Soils that are saturated, flooded, or ponded for long enough during the growing season to develop oxygen-deficient conditions in their upper part.

**Hydrology:** The science dealing with the properties, distribution, and circulation of water.

**Hydrophytic Vegetation:** Plants that have an affinity for wetlands and are found at least 50 percent of the time in wetlands.

**Indigenous Wildlife:** Native to an area, not imported.

**Integrated Pest Management (IPM):** A comprehensive approach to pest control or prevention that considers various chemical, physical, and biological suppression techniques; the habitat of the pest; and the interrelationship between pest populations and the ecosystem.

**Limestone:** A sedimentary rock made mostly of the mineral calcite (calcium carbonate). Limestone is usually formed from shells of once-living organisms or other organic processes, but may also form by inorganic precipitation.

**Loam:** Rich, permeable soil composed of a mixture of clay, silt, sand, and organic matter.

**Mesic:** Characterized by, or adapted to a moderately moist habitat.

**Mitigate:** Measures taken to reduce adverse impacts on the environment.

**Monoculture:** A population of a single kind of organism or plant variety.

**Multiple Use:** Use of land for more than one purpose (e.g., grazing of livestock, watershed and wildlife protection, recreation, and timber production). Also applies to use of bodies of water for recreational purposes, fishing, and water supply.

**National Ambient Air Quality Standards (NAAQS):** Standards established by EPA that apply for outdoor air throughout the country. The NAAQS represent maximum air pollutant standards that EPA set under the Clean Air Act for attainment by each state. The standards were to be achieved by 1975, along with state implementation plans to control industrial sources in each state.

**National Environmental Policy Act (NEPA):** The Act as amended articulates the Federal law that mandates protecting the quality of the human environment. It requires Federal agencies to systematically assess the environmental impacts of their proposed activities, programs, and projects including the “no action“ alternative of not pursuing the proposed action. NEPA requires agencies to consider alternative ways of accomplishing their missions in ways which are less damaging to the environment.

**National Historic Preservation Act of 1966 (16 U.S.C. §§470 et seq.):** An act to establish a program for the preservation of historic properties throughout the Nation, and for other purposes, Approved October 15, 1966 (Public Law 89-665; 80 STAT.915; 16 U.S.C. 470) as amended by Public Law 91-243, Public Law 93-54, Public Law 94-422, Public Law 94-458, Public Law 96-199, Public Law 96-244, Public Law 96-515, Public Law 98-483, Public Law 99-514, Public Law 100-127, and Public Law 102-575).

**National Register of Historic Places (National Register):** A register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.

**National Wetland Inventory:** A database from the U.S. Fish and Wildlife Service that produces information on the characteristics, extent, and status of the Nation’s wetlands and deepwater habitats.

**Native Species:** A species indigenous to an area (i.e. not introduced from another environment or area).

**Neotropical Migrants:** Birds that winter in South and Central America and come to temperate regions, such as the continental United States, to breed in the summer.

**Nonattainment Area:** Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

**Nonpoint Source Pollution:** Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by storm water. Common non-point sources are agriculture, forestry, urban, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

**Nutrient Cycling:** The movement of essential elements and inorganic compounds between the reservoir pool (soil, for example) and the cycling pool (organisms) in the rapid exchange (i.e., moving back and forth) between organisms and their immediate environment.

**Outcrop:** A mass of rock that appears at the earth's surface.

**Particulate Matter:** The fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions or very small solids suspended in water. Particulate matter can vary in size, shape, density and electrical charge and can be gathered together by coagulation and flocculation.

**Perennial:** A plant whose life cycle lasts for three or more seasons; lasting year after year.

**Permeability:** The rate at which liquids pass through soil or other materials in a specified direction.

**Physiographic Province.** A region all parts of which are similar in geologic structure and climate and which has consequently had a unified geomorphic history.

**Point Source Pollution:** A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution (e.g., a pipe, ditch, ship, ore pit, factory smokestack).

**Pools:** A deep reach of a stream or the reach of a stream between two riffles. Natural streams often consist of a succession of pools and riffles.

**Potable Water:** Water that is safe for drinking and cooking.

**Prescribed Burn:** Any fire ignited by management actions under certain predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

**Prime Farmland Soils:** Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses.

**Rain Shadow:** Also referred to as a precipitation shadow, it is the region on the lee side of a mountain or similar barrier where the precipitation is less than on the windward side. For example, the relatively dry Washoe Valley of western Nevada is in the rain shadow of the Sierra Nevada.

**Rare Species:** A species that has a small number of individuals and/or has a limited distribution. A rare species may or may not be endangered or threatened.

**Resource Stewardship:** Encompasses all activities required to maintain an adequate level of protection to human health and the environment.

**Riffle:** A rapid in a stream.

**Riparian Habitat:** Areas adjacent to rivers and streams with a differing density, diversity, and productivity of plant and animal species relative to nearby uplands.

**Lithology:** The physical character of a rock based on such characteristics as color, structures, mineralogic composition and grain size.

**Runoff:** That part of precipitation, snowmelt, or irrigation water that runs off the land into streams or other surface-waters.

**Sandstone:** Sedimentary rock made mostly of sand-sized grains

**Sedimentary Rock:** Sedimentary rocks are formed from pre-existing rocks or pieces of once-living organisms. They form from deposits that accumulate on the Earth's surface. Sedimentary rocks often have distinctive layering or bedding.

**Sedimentation:** The process of forming or accumulating sediments in layers, including such processes as the separation of rock particles or soils from the material from which the sediment is derived, the transportation of the particles to the site of deposition, and the actual deposition or mechanical settling from a state of suspension.

**Seismicity:** Subject to, or caused by an earthquake or earth vibration.

**Sensitive or Significant Habitat:** An area inhabited by rare, threatened, or endangered species; an ecosystem supporting a wide variety of plants, birds, and wildlife.

**Shale:** Sedimentary rock derived from mud. Commonly finely laminated (bedded). Particles in shale are commonly clay minerals mixed with tiny grains of quartz eroded from pre-existing rocks.

**Sikes Improvement Act of 1997 (16 U.S.C. 670a et seq.):** An Act to promote effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation on military reservations.

**Slope:** An inclined line, surface, plane, position, or direction.

**Snag:** A standing dead tree from which the leaves and most of the branches have fallen

**Soil Mapping Unit:** A soil or combination of soils delineated on a map and, where possible, named to show the taxonomic unit or units included.

**Stolons:** An above ground stem rooting at nodes.

**Stream Terrace:** One of a series of platforms in a stream valley flanking and more or less parallel to the stream channel originally formed near the level of the stream and representing the dissected remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of erosion or deposition.



**Succession:** Forest succession is a sequence of changes in the plant species composition (with associated animals and microbes) and stand structures over time, at a stand or larger scale—without major external disturbances like wind and fire that restart the sequence. Natural successional sequences are thought to have predictable patterns of development.

**Surface Water:** All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.).

**Sustainability:** A measure of the extent to which our activities meet the needs of the present without compromising the ability of future generations to meet their own needs.

**Syncline:** A fold in rocks in which the rock layers dip inward from both sides toward the axis.

**Terrain:** The surface features of an area of land; topography.

**Terrestrial:** Living on land rather than in water, in the air, in trees, etc. Growing on land or in the soil.

**Threatened Species:** "...any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (Section 3(19) of the ESA). The lead Federal agency for the listing of a species as threatened is responsible for reviewing the status of the species on a five-year basis.

**Topography:** The physical features of a surface area including relative elevations and the position of natural and man-made (anthropogenic) features.

**Tributary:** A stream that flows into a larger stream or other body of water.

**Vernal Pools:** Vernal pools are temporary bodies of freshwater that provide critical habitat for many vertebrate and invertebrate wildlife species. The pools typically cycle annually from flooded to dry and appear year after year at the same locations, except in exceptionally dry years. Most vernal pools are filled by spring rains and snowmelt, and dry up during the summer months. Many vernal pools, however, are filled by rainwater in the fall and may persist throughout the winter. Vernal pools may also exist as a result of seasonally high groundwater tables.

**Volatile Organic Compounds (VOC):** Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.

**Water Quality Criteria:** Levels of water quality expected to render a body of water suitable for its designated use. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes.

**Water Quality Standards:** State-adopted and EPA-approved ambient standards for water bodies. The standards prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses.

**Watershed:** The land area that drains into a stream; the watershed for a major river may encompass a number of smaller watersheds that ultimately combine at a common point.

**Wetlands:** The U.S. Army Corps of Engineers (Federal Register, 1982) and EPA (Federal Register, 1980) jointly define wetlands as: Those areas that are inundated or saturated by surface or ground water 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 generally include swamps, marshes, bogs, and similar areas.

**Xeric:** Of, characterized by, or adapted to an extremely dry habitat.

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## REFERENCES

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Regional Ecologist, Maryland Department of Natural Resources Wildlife and Heritage Division

West, Daisy

Bureau of Indian Affairs, Division of Tribal Government Services



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**APPENDIX A**  
**Agency Coordination and Correspondence**

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THE Louis Berger Group, INC.

1819 H Street, NW, Suite 900, Washington, DC 20006 USA

Tel 202 331 7775 Fax 202 293 0787 Email answers @ [louisberger.com](mailto:answers@louisberger.com) [www.louisberger.com](http://www.louisberger.com)

December 2, 1999

Mr. John Wolflin  
Office Supervisor  
United States Fish and Wildlife Service  
177 Admiral Cochrane Drive  
Annapolis, MD 21401

Attention: Ms. Charisa Morris

Dear Ms. Morris:

The Baltimore District of the U.S. Army Corps of Engineers has contracted the Louis Berger Group, Inc., on behalf of the Maryland Army National Guard, to prepare an Integrated Natural Resources Management Plan (INRMP) for the training site at the Lil Aaron Strauss Wilderness Area (LASWA), Allegany and Washington Counties, Maryland, in accordance with the Sikes Act Improvement Act of 1997 and Army Regulation 200-3 (*Natural Resources Land, Forest and Wildlife Management*). The Louis Berger Group will also prepare the environmental analysis and documentation required to comply with the National Environmental Policy Act (NEPA) of 1969, concurrent to the development of the INRMP. In accordance with NEPA, the Endangered Species Management Act, and the Fish and Wildlife Coordination Acts, the Environmental Assessment will evaluate the known environmental impacts, both positive and negative, associated with implementing the proposed management plan. The INRMP and associated NEPA documentation will be combined into a single document for LASWA.

The Maryland Natural Heritage Program conducted an inventory of rare, threatened, and endangered species and significant habitats on LASWA and vicinity in 1993-94. One Federally endangered plant species, *Ptilimnium nodosum* (harperella), was identified on LASWA during the survey. In addition, the survey documented 20 State of Maryland listed species on LASWA. State listed plant species documented during the survey on LASWA include: *Adlumia fungosa* (climbing fumitory), *Bromus latiglumis* (broad-glumed brome), *Carex tetanica* (Wood's sedge), *Carex radialis* (stellate sedge), *Chenopodium standleyana* (Standley's goosefoot), *Euphorbia obtusata* (blunt-leaved spurge), *Helianthus microcephalus* (small-headed sunflower), *Iris cristata* (crested iris), *Melica nitens* (three flowered melicgrass), *Plantanthera flava* (pale green orchid), *Polygala polygama* (racemed milkwort), *Primus alleghaniensis* (Allegany plum), *Ptilimnium nodosum* (harperella), *Solidago hispida* (hairy goldenrod), *Synosma suaveolens* (sweet-scented indian plantain), *Taenidia montana* (mountain pimpernel), *Woodsia ilvensis* (rusty woodsia), and *Zanthoxylum americanum* (northern prickly ash). State listed animal species identified during the survey include: *Cicindela ancocisconensis* (a tiger beetle), *Euchloe olympia* (Olympia marble, a butterfly), and *Lasmigona subviridis* (green floater, a mussel).

The purpose of this correspondence is to formally request a current list of federal- and state- listed threatened, endangered and candidate species that are known to occur, or that could potentially occur on, or in the vicinity of LASWA. I would also like to know if there are any other sensitive natural resources or ecosystems that should be considered during the development of the INRMP. For quick reference.



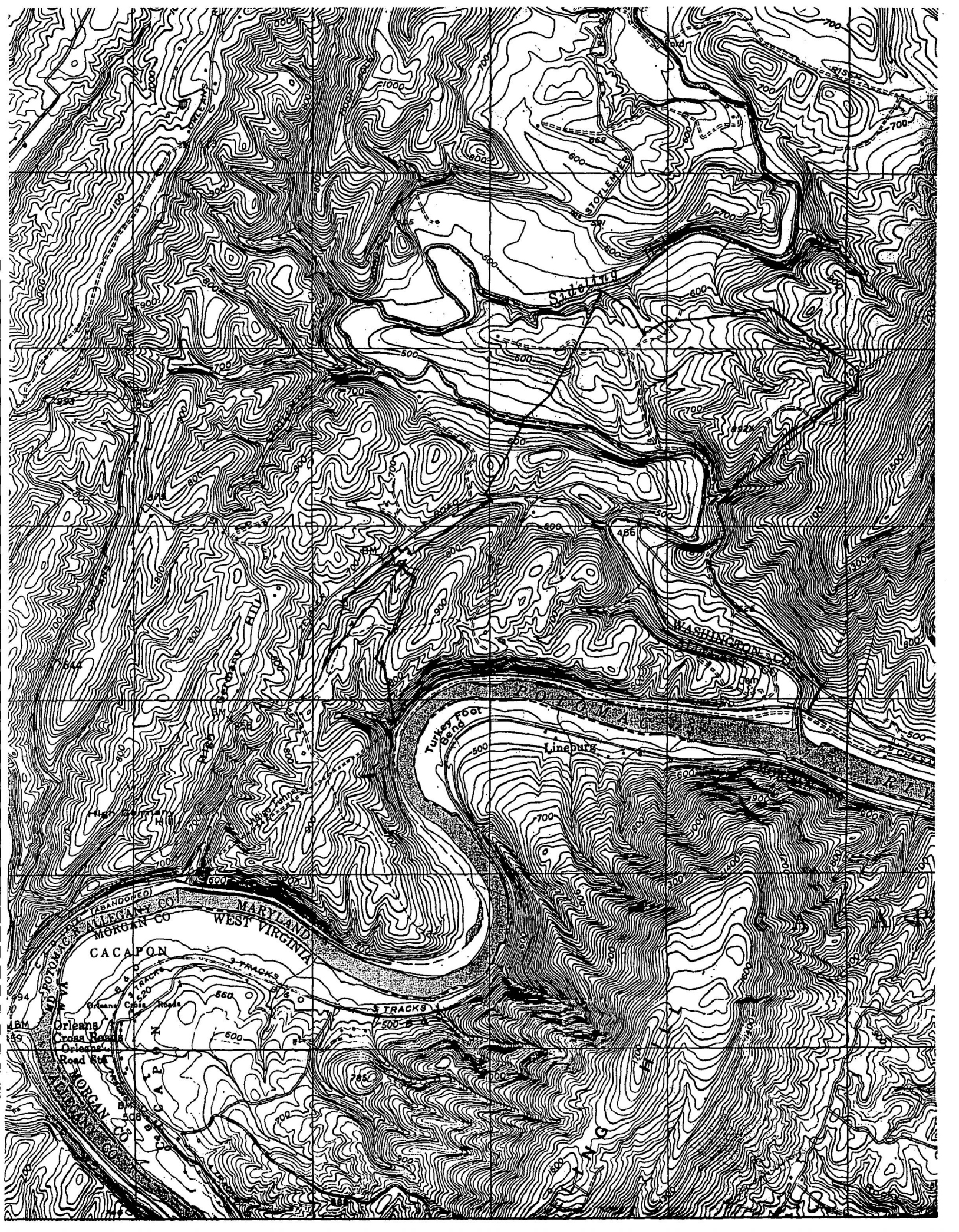
LASWA can be found on the USGS quadrangle map for Bellegrove, MD. I have also included a figure showing the boundaries of LASWA.

If you have any questions or need additional information, I can be reached by phone at (202) 231-7775 Ext. 497, by facsimile at (202) 293-0787, or by e-mail at [scauley@louisberger.com](mailto:scauley@louisberger.com). Thank you in advance for your assistance.

Sincerely,  
The Louis Berger Group

Shannon R. Cauley —  
Senior Ecologist

cc: Larry Eastman, Section Chief, Planning Division, USAGE Baltimore District  
Jess Commerford, Director, Planning and Environmental Services, The Louis Berger Group, Inc.







**THE Louis Berger Group, INC.**

1819 H Street, NW, Suite 900, Washington, DC 20006 USA

Tel 202 331 7775 Fax 202 293 0787 Email [answers@louisberger.com](mailto:answers@louisberger.com) [www.louisberger.com](http://www.louisberger.com)

December 2, 1999

Mr. Ed Thompson  
Regional Ecologist  
Maryland Department of Natural Resources  
Wildlife and Heritage Division  
1482 Sand Spring Road  
Meysersdale, PA 15552

Mr. Thompson:

On behalf of the Maryland Army National Guard, the U.S. Army Corps of Engineers, Baltimore District has contracted the Louis Berger Group, Inc. to prepare an Integrated Natural Resources Management Plan (INRMP) for the training site at the Lil Aaron Strauss Wilderness Area (LASWA), Allegany and Washington Counties, Maryland, in accordance with the Sikes Act Improvement Act of 1997 and Army Regulation 200-3 (*Natural Resources Land, Forest and Wildlife Management*). The Louis Berger Group will also prepare the environmental analysis and documentation required to comply with the National Environmental Policy Act (NEPA) of 1969, concurrent to the development of the INRMP. In accordance with NEPA, the Endangered Species Management Act, and the Fish and Wildlife Coordination Acts, the Environmental Assessment will evaluate the known environmental impacts, both positive and negative, associated with implementing the proposed management plan. The INRMP and associated NEPA documentation will be combined into a single document for LASWA.

The Maryland Natural Heritage Program conducted an inventory of rare, threatened, and endangered species and significant habitats on LASWA and vicinity in 1993-94. One Federally endangered plant species, *Ptilimnium nodosum* (harperella), was identified on LASWA during the survey. In addition, the survey documented 20 State of Maryland listed species on LASWA. State listed plant species documented during the survey on LASWA include: *Adlumia fungosa* (climbing fumitory), *Bromus latiglumis* (broad-glumed brome), *Carex tetanica* (Wood's sedge), *Carex radiata* (stellate sedge), *Chenopodium standleyana* (Standley's goosefoot), *Euphorbia obtusata* (blunt-leaved spurge), *Helianthus microcephalus* (small-headed sunflower), *Iris cristata* (crested iris), *Melica nitens* (three flowered melicgrass), *P. lant anther a flava* (pale green orchid), *Polygala polygama* (racemed milkwort), *Prunus alleghaniensis* (Allegany plum), *Ptilimnium nodosum* (harperella), *Solidago hispida* (hairy goldenrod), *Synosma suaveolens* (sweet-scented indian plantain), *Taenidia montana* (mountain pimpernel), *F. pootfofa ilvensis* (rusty woodsia), and *Zanthoxylum americanum* (northern prickley ash). State listed animal species identified during the survey include: *Cicindela ancocisconensis* (a tiger beetle), *Euchloe olympia* (Olympia marble, a butterfly), and *Lasmigona subviridis* (green floater, a mussel).

The purpose of this correspondence is to formally request a current list of federal- and state- listed threatened, endangered and candidate species that are known to occur, or that could potentially occur on, or in the vicinity of LASWA. I would also like to know if there are any other sensitive natural resources or ecosystems that should be considered during the development of the INRMP. For quick reference,



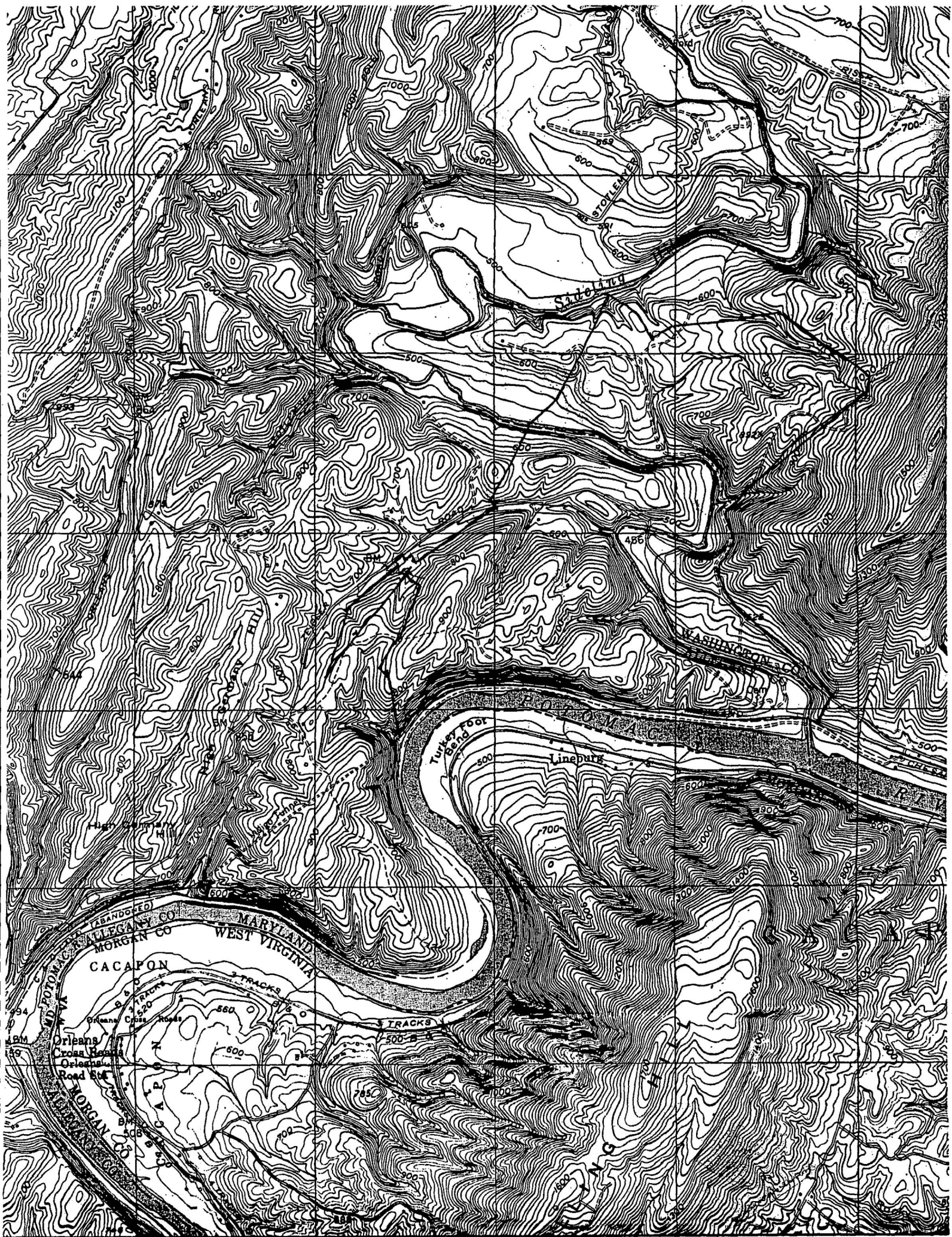
LASWA can be found on the USGS quadrangle map for Bellegrove, MD. I have also included a figure showing the boundaries of LASWA.

If you have any questions or need additional information, I can be reached by phone at (202) 231-7775 Ext. 497, by facsimile at (202) 293-0787, or by e-mail at [scauley@louisberger.com](mailto:scauley@louisberger.com). Thank you in advance for your assistance.

Sincerely,  
The Louis Berger Group, Inc.

Shannon R. Cauley  
Senior Ecologist

cc: Larry Eastman, Section Chief, Planning Division, USAGE Baltimore District  
Jess Commerford, Director, Planning and Environmental Services, The Louis Berger Group, Inc.





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1819 H Street, NW, Suite 900, Washington, DC 20006 USA  
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December 20, 1999

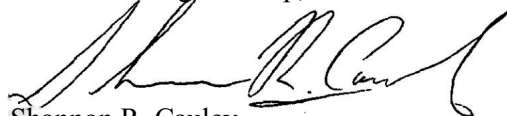
Ms. Lori Byrne, E-1  
Maryland Department of Natural Resources  
Wildlife and Heritage Division  
Tawes State Office Building  
580 Taylor Avenue  
Annapolis, Maryland 21401

Dear Ms. Byrne:

Enclosed is a copy of the correspondence letter that I sent to Mr. Ed Thompson regarding potential threatened, endangered, or candidate species occurring on, or in the vicinity of the Lil Aaron Straus Wilderness Area (also referred to as the Thomas B. Baker Training Facility), Allegany and Washington Counties, Maryland. As per our phone conversation, I am requesting a current list of federal- and state- listed threatened, endangered, and candidate species that occur on, or in the vicinity of the site. For quick reference, the site can be found on the USGS quadrangle map for Bellgrove, Maryland. I have also included a figure showing the boundaries of the site.

If you have any questions or need additional information, I can be reached by phone at (202) 231-7775 Ext. 497, by facsimile at (202) 293-0787, or by e-mail at [scauley@louisberger.com](mailto:scauley@louisberger.com). Thank you in advance for your assistance.

Sincerely,  
The Louis Berger Group, Inc.

  
Shannon R. Cauley  
Senior Ecologist





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December 13, 1999

Ms. Jo Ellen Hensley  
Administrator  
Project Review and Compliance  
Maryland Historical Trust  
100 Community Place  
Crownsville, Maryland 21032

Dear Ms. Hensley:

The Baltimore District of the U.S. Army Corps of Engineers has contracted the Louis Berger Group, Inc., on behalf of the Maryland Army National Guard (MDARNG), to prepare an Integrated Natural Resources Management Plan (INRMP) for the Brigadier General Thomas B. Baker Training Facility (TBBTF) at the Lil Aaron Straus Wilderness Area, Allegany and Washington Counties, Maryland, in accordance with the Sikes Act Improvement Act of 1997 and Army Regulation 200;3 (*Natural Resources Land, Forest and Wildlife Management*). The Louis Berger Group will also prepare the environmental analysis and documentation required to comply with the National Environmental Policy Act (NEPA) of 1969, concurrent to the development of the INRMP. In accordance with NEP A, and Section 106 of the National Historic Preservation Act of 1966, the Environmental Assessment will evaluate the potential effects that implementing the proposed management plan might have on cultural resources. The INRMP and associated NEP A documentation will be combined into a single document for TBBTF.

TBBTF is a MDARNG training site for small light infantry units. The primary training activities conducted at TBBTF include land navigation and mountaineering. Other training activities include night patrolling, operations security, combat intelligence, fundamentals of patrolling, and troop movement and small unit tactics. The primary users of TBBTF include the MDARNG and the Boy Scouts.

TBBTF is leased to the MDARNG by the Maryland Department of Natural Resources. The training site is divided into a Restricted Use Area and a General Use Area. Uses of the Restricted Area are substantially limited due to the presence of *Ptilimnium nodosum* (harperella) a federally endangered plant species. In addition, numerous state listed plant species and several sensitive habitats, including shale barrens, occur in the Restricted Use Area. The Restricted Area includes Sideling Hill Creek and riparian and adjacent areas of from approximately 300 to 2000 feet in width on both sides of the stream. As part of the lease agreement, most training activities are restricted to the General Use Area. Digging on TBBTF is prohibited and vehicle use is restricted to established roads and parking areas except under specific authority of the site manager. An assessment of potential environmental impact is required prior to each use and potential impacts are evaluated by completing the Army National Guard Environmental Checklist. Potential impacts to archeological or historical sites, structures, objects, or buildings are addressed in the Environmental Checklist.

Management activities being developed in the INRMP are expected to have no adverse effects on any cultural resources on, or adjacent to, TBBTF. Installation procedures to accomplish consultation

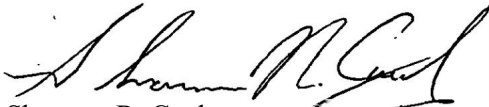


requirements under Section 106 of the National Historic Preservation Act will be initiated if it is determined that any activities prescribed in the INRMP have the potential to adversely affect cultural resources on TBBTF.

The purpose of this correspondence is to formally request a current list of known archeological or historical resources located on TBBTF. I would also like to know if there are any agency concerns regarding the potential occurrence of archeological resources on, or in the immediate vicinity of TBBTF that should be considered during the development of the INRMP. For quick reference, I have included a copy of the USGS 1:24,000 quadrangle map for Bellegrove, MD with installation boundaries shown. I have also included a figure showing the regional location of TBBTF.

If you have any questions or need additional information, I can be reached by phone at (202) 231-7775 Ext. 497, by facsimile at (202) 293-0787, or by e-mail at [scauley@louisberger.com](mailto:scauley@louisberger.com). Thank you in advance for your assistance.

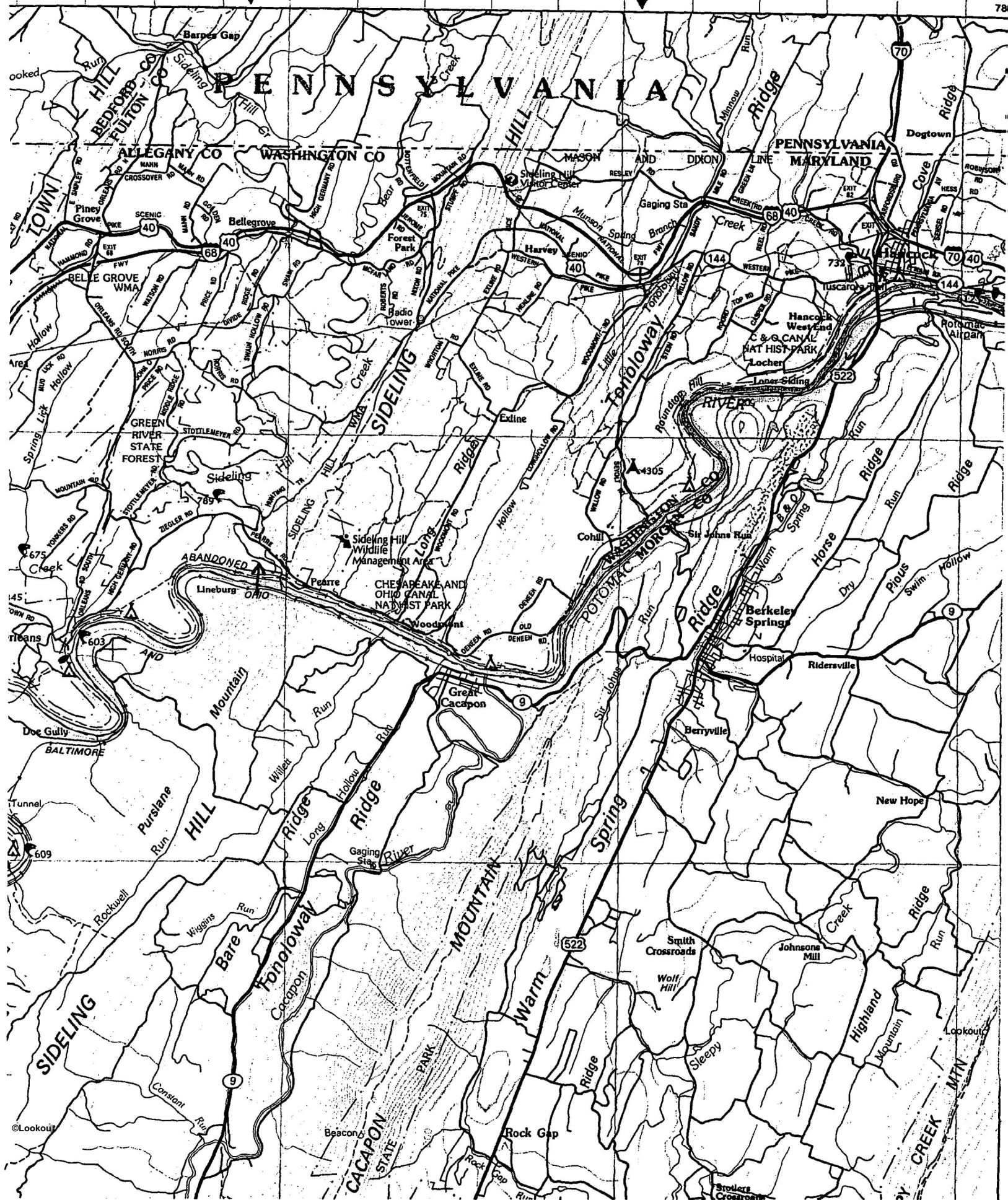
Sincerely,  
The Louis Berger Group



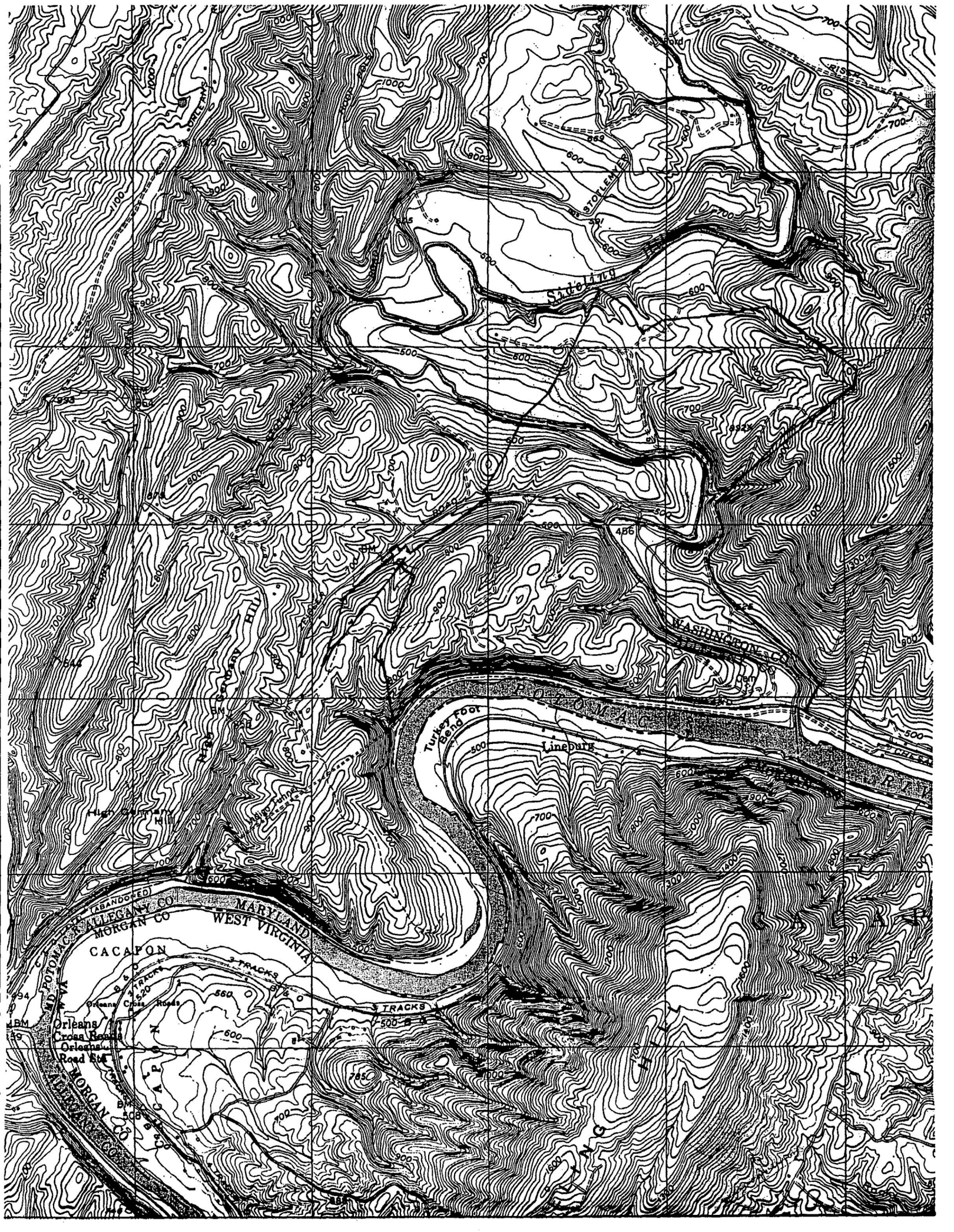
Shannon R. Cauley      zsl

Senior Ecologist

cc:      Larry Eastman, Section Chief, Planning Division, USACE Baltimore District  
         Jess Commerford, Director, Planning and Environmental Services, The Louis Berger Group, Inc.





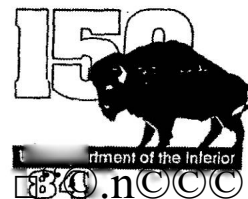




## United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, MD 21401



December 16, 1999

Ms. Shannon R. Cauley  
Senior Ecologist  
The Louis Berger Group, Inc.  
1819 H Street, NW, Suite 900  
Washington, DC 20006

RE: Training site at the Lil Aaron Strauss  
Wilderness Area (LASWA);  
Allegany and Washington Counties,  
MD

Dear Ms. Cauley:

This responds to your December 2, 1999, request for information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the above referenced project area. We have reviewed the information you enclosed and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The federally endangered plant species *Harperella (Ptilimnium nodosum)* is present within LASWA. *Harperella*, which exists in palustrine riverine wetlands, has been documented to occur along Sideling Hill Creek in several different areas. The Sideling Hill Creek drainage supports the most significant population of *Harperella* in Maryland; a major segment of this population occurs in LASWA. In addition Sideling Hill Creek, within LASWA, supports the green floater mussel (*Lasmigona subviridis*) a Federal species of special concern. Sideling Hill Creek supports the only significant population of this mussel species in Maryland. We consider the Sideling Hill Creek watershed to constitute a significant (and sensitive) watershed/ecosystem both because of its high species diversity and its relatively undisturbed nature.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the basin's

remaining wetlands, and the long term of increasing the quality and quantity of the basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands proposed, the U.S. Army Corps of Engineers, Baltimore District should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Andy Moser at (410) 573-4537.

Sincerely,

A handwritten signature in black ink, reading "Robert J. Pennington". The signature is written in a cursive style with a large initial "R".

Robert J. Pennington v  
Assistant Field Supervisor  
Div. of Habitat Evaluation and Protection



Parris N. Glendening  
Governor

Maryland Department of Natural Resources  
Wildlife & Heritage Division

Sarah J. Taylor-Rogers, Ph.D.  
Secretary

*Natural Heritage*  
Jan. 18, 2001

Shannon R. Cauley  
The Louis Berger Group, Inc.  
1819 H Street, NW, Suite 900  
Washington, DC 20006

Shannon,

Regarding your request for rare or endangered species information for the development of your management plan - if you have the information from the Natural Heritage's inventory of 1993-94, I can provide little information that will improve on that. A list of additional species that may occur there would be more pertinent for an area that has received less field work than this place, but certain animals are the most likely candidates to have been missed in previous surveys. Several butterfly species that have not been documented from there come to mind.

For instance, there is a good chance that a population of giant swallowtails, *Papilio cresphontes*, occurs there since two of its host plants grow on the property. It is listed as In Need of Conservation, which is one of the official designations under Maryland's Endangered Species Law. Another very rare butterfly, the grizzled skipper, *Pyrgus wyandot*, may occur somewhere on the property. It is listed as State Endangered in Maryland and is declining throughout its range. Other rare butterflies that have a legitimate chance of being on the property include: pepper and salt skipper (*Amblyscirtes hegori*), northern metalmark (*Calephelis borealis*), mottled duskywing (*Erynnis martialis*), northern hairstreak (*Fixsenia Ontario*), silvery blue (*Glaucopsyche lygdamus*), Compton's tortoise-shell (*Nymphalis van-album*), and Edward's hairstreak (*Satyrium edwardsii*). I may have time to search for these species in future field seasons.

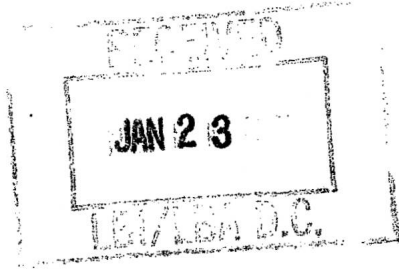
An uncommon salamander ('watch-list' species) known as the Jefferson salamander (*Ambystoma jeffersonianum*) may occur on the site as it has been documented on the nearby C&O Canal property. Any temporary pools on the property should be checked in March for this species' eggs. Also, a population of timber rattlesnakes (*Crotalus horridus*) occurs on the property, but the den location is sensitive information. It should be understood by the National Guard that this species is protected in Maryland.

Hope this helps.

Regards,



Ed Thompson  
Natural Heritage Biologist  
Maryland DNR







**Maryland  
Department of  
Housing and  
Community  
Development**

*Division of Historical and  
Cultural Programs*

100 Community Place  
Crownsville, Maryland 21032

410-514-7600

1-800-756-0119

Fax: 410-987-4071

Maryland Relay for the Deaf:

1-800-735-2258

<http://www.dhcd.state.md.us>

Parris N. Glendening  
*Governor*

Raymond A. Skinner  
*Secretary*

Marge Wolf  
*Deputy Secretary*

13 January 2000

Ms. Shannon R Cauley  
The Louis Berger Group, Inc.  
1819 H Street, NW, Suite 900  
Washington, DC 20006

Re: Management Plan for Brigadier General Thomas B. Baker Training Facility,  
Allegany and Washington Counties, Maryland

Dear Ms. Cauley:

In response to your letter of 13 December 1999, this office has reviewed the above-referenced project with respect to information on historic properties.

Our files show no inventoried archeological sites in the study area nor professional surveys to locate such sites. However, there is potential that prehistoric archeological resources could exist, especially in the valley of Sideling Hill Creek. Prehistoric Indian sites often are located near streams in the region (e.g., R.J. Dent, Jr., 1995, Chesapeake Prehistory). Additionally, ^historic archeological resources may be associated with the grist and saw mill depicted on the enclosed 1877 map of Washington County's Hancock District. If this mill was not too far west, its remains might be found within the study area. Of further historical archeological concern is the Chesapeake & Ohio Canal, just south of your project area.

Based upon the available information there appear to be no historic structures within the boundary of the TBBT facility, ^ut along the southern edge of the facility lies the Railway Right-of-Way, milepost 126 to milepost 160, which is listed in the National Register of Historic Places. Please find enclosed a copy of a GIS map indicating the National Register site.

We look forward to hearing directly from the Baltimore District of the U.S. Army Corps of Engineers for eventual Section 106 coordination on the effects of the management plan on cultural properties. If you have any questions or require further information, please contact Dr. Gary Shaffer (archeology, 410-514-7638) or Ms. Patricia McCloskey (structures, 410-514-7637).

Sincerely,

Elizabeth J. Cole  
Administrator  
Archeological Services

EJC/GDS/PEM  
199903431

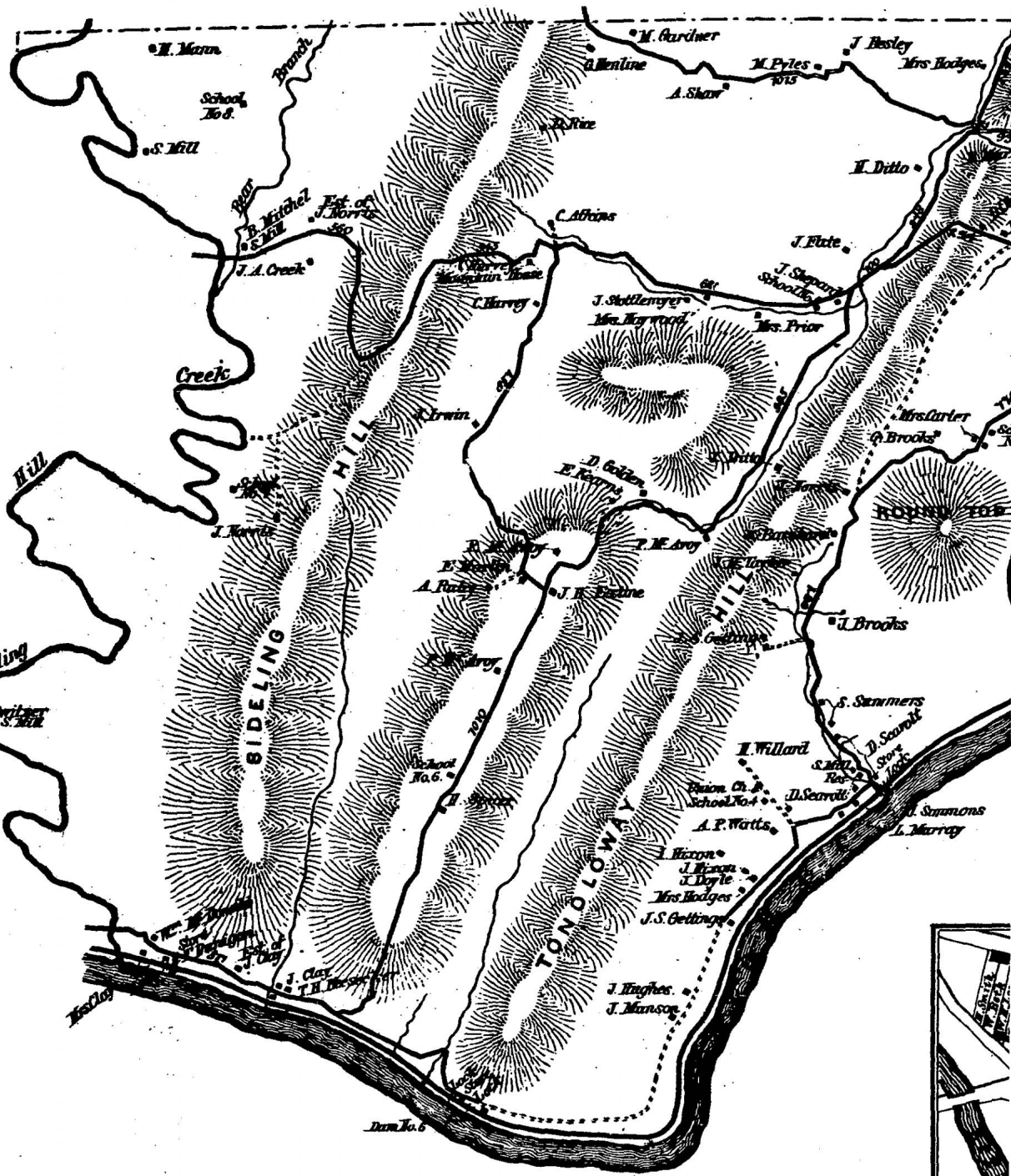
cc: Mr. Larry Eastman (COE, Planning)  
Mr. Howard Buchanan

Enclosures



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Mill  
↑  
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H. Switzer  
O. S. Mill



# HANCOCK

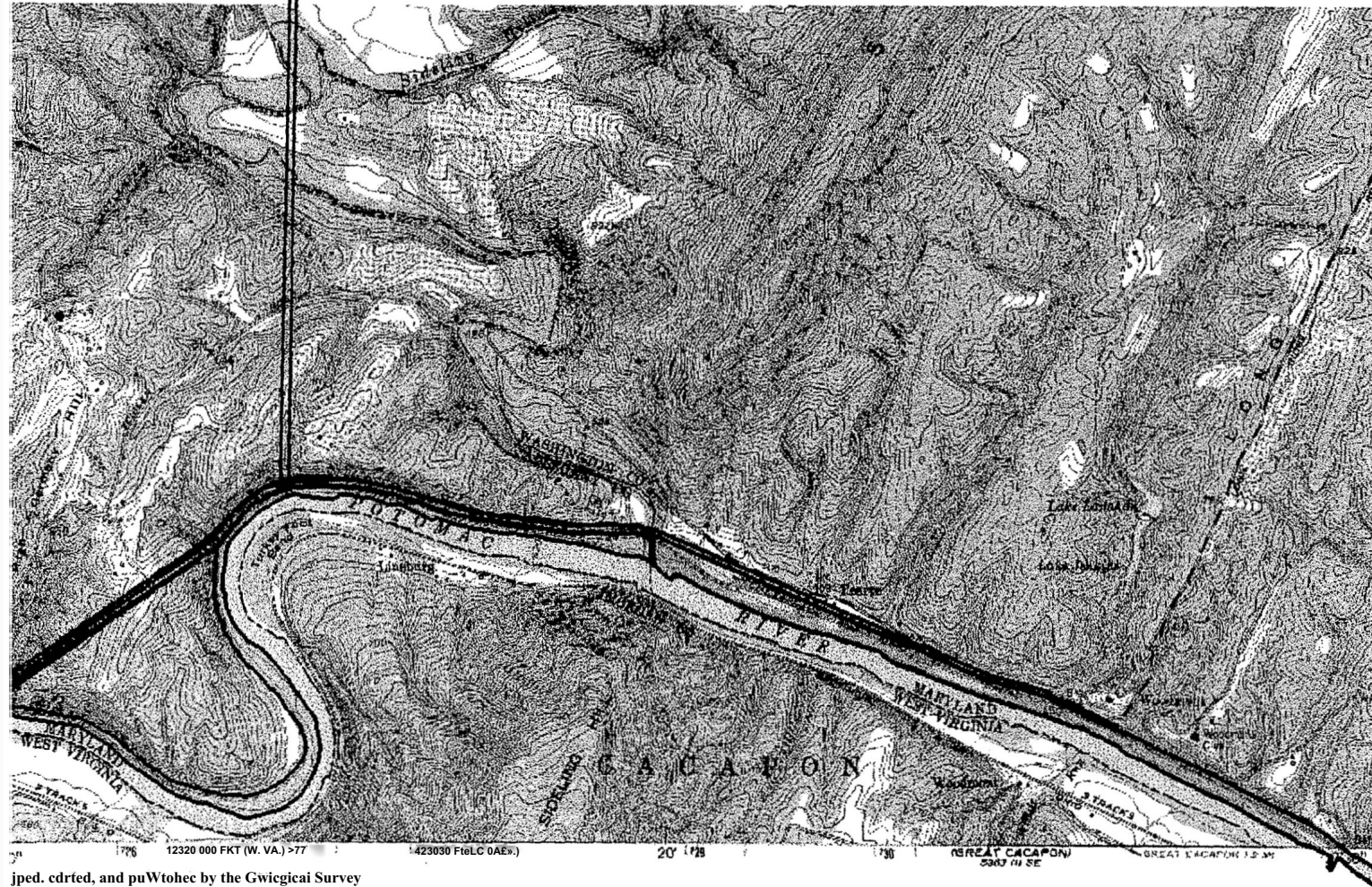
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National Register: Railway Right-of-way

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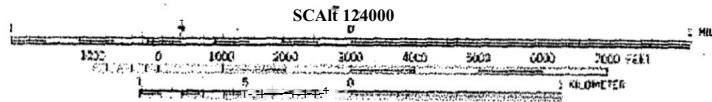
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**APPENDIX B**  
**Bird Species Occurring in the Vicinity of**  
**TBBTF**

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## BIRD SPECIES OCCURRING IN THE VICINITY OF TBBTF

Scientific Name	Common Name
<i>Accipiter cooperii</i>	Cooper's Hawk
<i>Accipiter gentilis</i>	Northern Goshawk
<i>Accipiter striatus</i>	Sharp-shinned Hawk
<i>Actitis macularia</i>	Spotted Sandpiper
<i>Agelaius phoeniceus</i>	Red-winged Blackbird
<i>Aix sponsa</i>	Wood Duck
<i>Anas americana</i>	American Black Duck
<i>Anas crecca</i>	Green-winged Teal
<i>Anas platyrhynchos</i>	Mallard
<i>Archilochus colubris</i>	Ruby-throated Hummingbird
<i>Aythya collaris</i>	Ring-necked Duck
<i>Bombycilla cedrorum</i>	Cedar Waxwing
<i>Bonasa umbellus</i>	Ruffed Grouse
<i>Bubo virginianus</i>	Great Homed Owl
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<i>Buteo lineatus</i>	Red-shouldered Hawk
<i>Buteo platypterus</i>	Broad-winged Hawk
<i>Butorides virescens</i>	Green-backed Heron
<i>Caprimulgus vociferus</i>	Whip-poor-will
<i>Cardinalis cardinalis</i>	Northern Cardinal
<i>Carduelis tristis</i>	American Goldfinch
<i>Carpodacus mexicanus</i>	House Finch
<i>Carpodacus purpureus</i>	Purple Finch
<i>Cathartes aura</i>	Turkey Vulture
<i>Catharus fuscescens</i>	Veery
<i>Catharus guttatus</i>	Hermit Thrush
<i>Catharus minimus</i>	Gray-cheeked Thrush
<i>Catharus ustulatus</i>	Swainson's Thrush
<i>Certhis americana</i>	Brown Creeper
<i>Ceryle alcyon</i>	Belted Kingfisher
<i>Chaetura pelagica</i>	Chimney Swift
<i>Charadrius vociferus</i>	Killdeer
<i>Chordeiles minor</i>	Common Nighthawk
<i>Coccothraustes vespertinus</i>	Evening Grosbeak
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo
<i>Colaptes auratus</i>	Northern Flicker
<i>Columba livia</i>	Rock Dove
<i>Contopus virens</i>	Eastern Wood Pewee
<i>Corvus brachyrhynchos</i>	American Crow
<i>Corvus corax</i>	Common Raven
<i>Corvus ossifragus</i>	Fish Crow
<i>Cyanocitta cristata</i>	Blue Jay

## BIRD SPECIES OCCURRING IN THE VICINITY OF TBBTF

Scientific Name	Common Name
<i>Dendroica caerulescens</i>	Black-throated Blue Warbler
<i>Dendroica castanea</i>	Bay-breasted Warbler
<i>Dendroica cerulea</i>	Cerulean Warbler
<i>Dendroica coronata</i>	Yellow-rumped Warbler
<i>Dendroica discolor</i>	Prairie Warbler
<i>Dendroica dominica</i>	Yellow-throated Warbler
<i>Dendroica fusca</i>	Blackburnian Warbler
<i>Dendroica magnolia</i>	Magnolia Warbler
<i>Dendroica palmarum</i>	Palm Warbler
<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler
<i>Dendroica petechia</i>	Yellow Warbler
<i>Dendroica striata</i>	Blackpoll Warbler
<i>Dendroica tigrina</i>	Cape May Warbler
<i>Dendroica virens</i>	Black-throated Green Warbler
<i>Dryocopus pileatus</i>	Pileated Woodpecker
<i>Dumetella carolinensis</i>	Gray Catbird
<i>Empidonax alnorum</i>	Alder Flycatcher
<i>Empidonax minimus</i>	Least Flycatcher
<i>Empidonax traillii</i>	Willow Flycatcher
<i>Empidonax virescens</i>	Acadian Flycatcher
<i>Falco columbarius</i>	Merlin
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Falco sparverius</i>	American Kestrel
<i>Gavia immer</i>	Common Loon
<i>Geothlypis trichas</i>	Common Yellowthroat
<i>Guiraca caerulea</i>	Blue Grosbeak
<i>Helmitheros vermivorus</i>	Worm-eating Warbler
<i>Hirundo rustica</i>	Barn Swallow
<i>Hylocichla mustelina</i>	Wood Thrush
<i>Icteria virens</i>	Yellow-breasted Chat
<i>Icterus galbula</i>	Northern Oriole
<i>Icterus spurius</i>	Orchard Oriole
<i>Junco hyemalis</i>	Dark-eyed Junco
<i>Lophodytes cucullatus</i>	Hooded Merganser
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker
<i>Meleagris gallopavo</i>	Wild Turkey
<i>Melospiza melodia</i>	Song Sparrow
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Mniotilta varia</i>	Black-and-white Warbler
<i>Molothrus ater</i>	Brown-headed Cowbird
<i>Myiarchus crinitus</i>	Great Crested Flycatcher
<i>Oporornis formosus</i>	Kentucky Warbler
<i>Otus asio</i>	Eastern Screech-owl



## BIRD SPECIES OCCURRING IN THE VICINITY OF TBBTF

Scientific Name	Common Name
<i>Pandion haliaetus</i>	Osprey
<i>Parula americana</i>	Northern Parula
<i>Passer domesticus</i>	House Sparrow
<i>Passerina cyanea</i>	Indigo Bunting
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak
<i>Picoides pubescens</i>	Downy Woodpecker
<i>Picoides villosus</i>	Hairy Woodpecker
<i>Pipilo erythrophthalmus</i>	Rufous-sided Towhee
<i>Piranga olivacea</i>	Scarlet Tanager
<i>Poecile atricapillus</i>	Black-capped Chickadee
<i>Poecile bicolor</i>	Tufted Titmouse
<i>Poliotila caerulea</i>	Blue-gray Gnatcatcher
<i>Progne subis</i>	Purple Martin
<i>Protonotaria citrea</i>	Prothonotary Warbler
<i>Quiscalus quiscula</i>	Common Grackle
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Regulus satrapa</i>	Golden-crowned Kinglet
<i>Riparia riparia</i>	Bank Swallow
<i>Scolopax minor</i>	American Woodcock
<i>Seiurus aurocapillus</i>	Ovenbird
<i>Seiurus motacilla</i>	Louisiana Waterthrush
<i>Seiurus noveboracensis</i>	Northern Waterthrush
<i>Setophaga ruticilla</i>	American Redstart
<i>Sialia sialis</i>	Eastern Bluebird
<i>Sitta canadensis</i>	Red-breasted Nuthatch
<i>Sitta carolinensis</i>	White-breasted Nuthatch
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker
<i>Stelgidopteryx serripennis</i>	Northern rough-winged Swallow
<i>Strix varia</i>	Barred Owl
<i>Sturnus vulgaris</i>	European Starling
<i>Tachycineta bicolor</i>	Tree Swallow
<i>Thryothorus ludovicianus</i>	Carolina Wren
<i>Toxostoma rufum</i>	Brown Thrasher
<i>Tringa solitaria</i>	Solitary Sandpiper
<i>Troglodytes aedon</i>	House Wren
<i>Troglodytes troglodytes</i>	Winter Wren
<i>Turdus migratorius</i>	American Robin
<i>Tyrannus tyrannus</i>	Eastern Kingbird
<i>Vermivora chrysoptera</i>	Golden-winged Warbler
<i>Vermivora peregrina</i>	Tennessee Warbler
<i>Vermivora pinus</i>	Blue-winged Warbler
<sup>1</sup> <i>Vermivora ruficapilla</i>	Nashville Warbler

**BIRD SPECIES OCCURRING IN THE VICINITY OF TBBTF**

<b>Scientific Name</b>	<b>Common Name</b>
<i>Vireo flavifrons</i>	Yellow-throated Vireo
<i>Vireo gilvus</i>	Warbling Vireo
<i>Vireo griseus</i>	White-eyed Vireo
<i>Vireo olivaceus</i>	Red-eyed Vireo
<i>Vireo philadelphicus</i>	Philadelphia Vireo
<i>Vireo solitarius</i>	Solitary Vireo
<i>Wilsonia citrina</i>	Hooded Warbler
<i>Zenaida macroura</i>	Mourning Dove
<i>Zonotrichia albicollis</i>	White-throated Sparrow

Source: MDDNR WHD, 1995



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**APPENDIX C**  
**Common Woody Plants Occurring on TBBTF**

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## COMMON WOODY PLANTS OCCURRING ON TBBTF

Scientific Name	Common Name
<i>Acer negundo</i>	box elder
<i>Acer rubrum</i>	red maple
<i>Acer saccharum</i>	sugar maple
<i>Ailanthus altissima</i>	tree of heaven
<i>Amelanchier</i> sp.	serviceberry
<i>Betula lenta</i>	black birch
<i>Betula nigra</i>	river birch
<i>Carpinus caroliniana</i>	ironwood
<i>Carya glabra</i>	pignut hickory
<i>Carya ovata</i>	shagbark hickory
<i>Carya tomentosa</i>	mockemut hickory
<i>Celtis occidentalis</i>	hackberry
<i>Cercis canadensis</i>	redbud
<i>Comus amomum</i>	silky dogwood
<i>Comus florida</i>	flowering dogwood
<i>Fraxinus americana</i>	white ash
<i>Hamamelis virginiana</i>	witch hazel
<i>Lireodendron tulipifera</i>	yellow poplar
<i>Magnolia acuminata</i>	cucumbertree
<i>Nyssa sylvatica</i>	blackgum
<i>Pinus pungens</i>	table mountain pine
<i>Pinus strobus</i>	eastern white pine
<i>Pinus virginiana</i>	Virginia pine
<i>Plantanus occidentalis</i>	sycamore
<i>Prunus serotina</i>	black cherry
<i>Ptelea trifoliata</i>	hop tree
<i>Quercus alba</i>	white oak
<i>Quercus coccinea</i>	scarlet oak
<i>Quercus prinus</i>	chestnut oak
<i>Quercus rubra</i>	red oak
<i>Quercus velutina</i>	black oak
<i>Rhododendron maximum</i>	great laurel
<i>Rhus copallina</i>	winged sumac
<i>Robinia pseudoaccacia</i>	black locust
<i>Sambucus canadensis</i>	elderberry
<i>Sasafras albidum</i>	sassafras
<i>Tilia heterophylla</i>	white basswood
<i>Tsuga canadensis</i>	eastern hemlock
<i>Ulmus rubra</i>	slippery elm

Source: Davis, 1997

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**APPENDIX D**  
**State Rare, Threatened or Endangered Plant**  
**Species Occurring in the Vicinity of TBBTF,**  
**but Not Recorded on the Facility**

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**STATE RARE, THREATENED OR ENDANGERED PLANT SPECIES  
OCCURRING IN THE VICINITY OF TBBTF, BUT NOT RECORDED ON THE  
FACILITY**

<b>Scientific Name</b>	<b>Common Name</b>
<i>Agrimonia microcarpa</i>	small fruited agrimony
<i>Agrimonia striata</i>	woodland agrimony
<i>Amelanchier spicata</i>	running juneberry
<i>Arabis missouriensis</i>	Missouri rockcress
<i>Arabis shortii</i>	Short's rockcress
<i>Astragalus canadensis</i>	Canada milkvetch
<i>Blephilia hirsuta</i>	hairy woodmint
<i>Bouteloua curtipendula</i>	side-oats gramma
<i>Bromus ciliatus</i>	fringed brome
<i>Cacalia muhlenbergii</i>	great Indian plantain
<i>Calamagrostis porteri</i>	Porter's reedgrass
<i>Capanula divaricata</i>	southern hairbell
<i>Cardimine pratensis</i>	cuckoo flower
<i>Carex hitchcockiana</i>	Hitchcock's sedge
<i>Carex shortiana</i>	Short's sedge
<i>Carya laciniosa</i>	big shellbark hickory
<i>Chenopodium gigantospermum</i>	maple-leaved goosefoot
<i>Coeloglossum viride</i>	long-bracted orchis
<i>Dicentra eximia</i>	wild bleeding heart
<i>Dicra palustris</i>	leatherwood
<i>Erythronium albidum</i>	white trout lily
<i>Eupatorium maculatum</i>	spotted joe-pye-weed
<i>Galactia volubilis</i>	downy milk vetch
<i>Helianthus laevigatus</i>	smooth sunflower
<i>Houstonia tenuifolia</i>	slender-leaved bluets
<i>Isotria medeoloides</i>	small whorled pogonia
<i>Lathyrus palustris</i>	vetchling
<i>Liatris spicata</i>	spiked blazing star
<i>Liatris turgida</i>	robust blazing star
<i>Matelea obliqua</i>	climbing milkweed
<i>Matteuccia struthiopteris</i>	ostrich fem
<i>Melanthium latifolium</i>	broad leaved bunchflower
<i>Minuartia michauxii</i>	rock sandwort
<i>Pachistima canbyi</i>	Canby's mountain lover
<i>Panicum oligosanthos</i>	few-flowered panicgrass
<i>Paronychia virginica</i>	yellow nailwort
<i>Parthenium integrifolium</i>	American feverfew
<i>Polygala senega</i>	Seneca snakeroot
<i>Porteranthus stipulatus</i>	American ipecac
<i>Pyenanthemum virginianum</i>	Virginia mountain mint
<i>Quercus shumardii</i>	Shumard's red oak

**STATE RARE, THREATENED OR ENDANGERED PLANT SPECIES  
OCCURRING IN THE VICINITY OF TBBTF, BUT NOT RECORDED ON THE  
FACILITY**

<b>Scientific Name</b>	<b>Common Name</b>
<i>Ranunculus micranthus</i>	rock crowfoot
<i>Rueilia strepens</i>	rustling wild petunia
<i>Scutellaria leonardii</i>	Lenard's skullcap
<i>Spiranthes ochroleuca</i>	yellow nodding ladies' tresses
<i>Vallerianella chenopodiifolia</i>	goose-foot comsalad
<i>Vicia americana</i>	purple vetch

Source: MNHP, 1995

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**APPENDIX E**  
**Newspaper Ads Announcing the Notice of**  
**Availability of the INRMP for Public Review**  
**and Comment**

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THE  
HERALD  MAIL

P.O. Box 439, 100 Summit Avenue  
Hagerstown, MD 21740  
301-733-5131

1/23/01

State of Maryland, County of Washington

It is hereby certified by the undersigned that the Herald-Mail is a daily newspaper of general circulation, printed in the English language and published in the City of Hagerstown in said County and State; and that the attached order, notice, publication or advertisement of

MARYLAND ARMY NATIONAL GUARD  
FIFTH REGIMENT ARMORY  
29TH DIVISION STREET  
BALTIMORE, MD 21201

was published in said newspaper 5 times with said publication being made on the following dates:

01/19/01, 01/20/01, 01/21/01, 01/22/01, 01/23/01

The Herald-Mail has been continuously published as a daily newspaper, and entered as second class mail matter at the post office at the City of Hagerstown, Maryland, each for a period of more than one year next presided the date of the first publication of the above described order, notice, and/or advertisement.

Ad Number: 437476                      Class Code: 140                      Notices  
Tagline: MARYLAND ARMY NATIONAL GUARD NOTICE OF AVAILABILITY-  
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AND  
ENVIRONMENTAL ASSESSMENT The Maryland Army national Guard has made

  
Representative of Herald-Mail Co.

On behalf of the corporation.



**\* MARYLAND ARMY  
NATIONAL GUARD  
NOTIFICATION OF AVAILABILITY-  
INTEGRATED NATURAL  
RESOURCES MANAGEMENT  
PLAN AND ENVIRONMENTAL  
ASSESSMENT ?**

The Maryland Army National Guard has made available to interested governmental and private bodies and individuals an Environmental Assessment (EA) for implementation of the Integrated Natural Resources Management Plan for the Thorites / B. Baker Training Facility located near Hancock, Maryland. The EA is incorporated into the Integrated Natural Resources Management Plan (INRMP) BH.

The EA considers potential impacts to the natural and manmade environments including biological resources, water resources, land use, air quality, noise, and cultural resources, among other topics. Written comments concerning the EA and the proposed action must be received by February 20, 2001 to be assured of consideration and should be sent to: Rhannon Cauley, The Louis Berger Group, Inc., 1819 H. Street, NW, Suite 900, Washington, DC 20006. Tel: 202-331-7777 ext. AW, Fax: 202-297-2977. The INRMP and EA is available for review between January 20 and February 20, 2001. The document will be available at the following locations: a) Hancock Library, 290 Park Road, Hancock, Maryland 21750; b) Allegany County Library, 31 Washington Street, Cumberland, Maryland 21502; c) Washington County Free Library, IOChS, Potomac St., Hagerstown, MD 21740. Thank you for your interest.

# CERTIFICATE OF PUBLICATION

From **The Frederick News-Post** • Frederick, MD

MARYLAND ARMY  
NATIONAL GUARD  
NOTICE OF AVAILABILITY -  
INTEGRATED  
NATURAL RESOURCES  
AND

V. S. > K < S S E S S M E W J  
4k  
The Maryland Army National Guard has made available to interested government and private bodies an environmental assessment (EA) for its proposed implementation of an Integrated Natural Resources Management Plan (INRM) for the Twining Facility located near Maryland.

The EA will address the potential impacts to natural and managed environments. Included are biological resources, water resources, and socioeconomics, transportation, and cultural resources. Written comments received by March 10, 2001, will be considered, and should be sent to M. S. Cauley, The BWM Group, Inc., 1819 H Street, NW, Suite 900, Washington, DC 20006. Telephone: 202-474-4744. Fax: 202-474-4744.

The EA considers potential impacts to natural and managed environments. Included are biological resources, water resources, and socioeconomics, transportation, and cultural resources. Written comments received by March 10, 2001, will be considered, and should be sent to M. S. Cauley, The BWM Group, Inc., 1819 H Street, NW, Suite 900, Washington, DC 20006. Telephone: 202-474-4744. Fax: 202-474-4744.

INRM  
and EA available for review between February 10 and March 10, 2001. The EA will be available at the following locations: a) Cock Library, 290 Park Road, Hancock, Maryland JZSQ: j>. Al-  
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South ^Potomac Sn^fct.j. Ha-  
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interest!"  
Feb. 8, 9, 10, 12 & 13, 2001

Frederick, MD., 20 Feb. 13,

This is to certify that the annexed Notice  
was published in The Frederick News-Post two newspapers  
published in Frederick County on the following dates:  
to, | a. Feb. 8, 2001

The Frederick News-Post

Per Kimberly C. Polmy

## PUBLIC NOTICES

### MARYLAND ARMY NATIONAL GUARD

#### NOTICE OF AVAILABILITY

#### PROPOSED NATURAL RESOURCES MANAGEMENT PLAN AND ENVIRONMENTAL ASSESSMENT

The Maryland Army National Guard has made available to interested governmental and private bodies and individuals an environmental assessment (EA) for its proposed <sup>66</sup>PI Mtht (sitid) ^IW Integirbfcf\$ - Natural Resources Management PlahtW\* the Thomas " B. Baker Training Facility. The EA is <sup>7</sup>in^fidpted into- \* tKWintegrated- Natural Resources <sup>SS</sup>Mgh4geihent Plaii (IF^MRhhf < \* N

The EA considers potential impacts to the natural and manmade <sup>&v</sup>TO@9^f^U-inCludii>g biOlbgidaKResources, water resources, land use, economics, air quality, noise, socioeconomics, <sup>&p</sup>pbrtatioi/ apd? pultura^ sources among other topics. Written comments concerning the EA and the proposed action must be received by March 10, 2001 to be assured of consideration and <sup>474</sup>> WW^OW^ sent to: Spgffipp; Oaue^ - ^Jtg Loui\$ Bergbi^ Cxr. sup, Inc. 1819 H. Str^ W^Suite f\$0, Washington, DCV2&0Q6. Telephone: 202-331-7775 (Ext.

The INRMP and EA is <sup>ay</sup>ilable/ fdr^Tevie^teWebn February 10 and March 10, 2001. The document will be available at the following locations: a) Hancock Library, 290 Park Road, Hancock, Maryland 21750; b) Allegheny County Library, 31. Washington Street, Cumberland, Maryland 21502; c) Washington County Free Library, 100 South Colonial Street, Hagerstown, Maryland 21740. Thank you for your interest.

2-14-3thn

## SEALED BIDS

The Berkeley Springs Volunteer Fire Company has for sale (by sealed bid) a 1982 Chevy 1 ton 4x4 truck chassis with ambulance body. For information contact Allen Truax at 304-258-5868 or 304-258-3191. All sealed bids will be opened on February 26 at 7:30 p.m. at the regular company meeting.

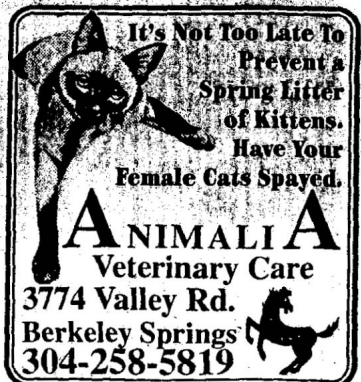
Send all bids to Berkeley Springs Vol. Fire Co., P.O. Box 142, Berkeley Springs, WV 25411. Attn: Committee for Sealed Bids.

The Berkeley Springs Volunteer Fire Company reserves the right to accept or refuse any or all bids.

2-14-2thp

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**APPENDIX F**  
**Agency Response to Review of the Draft**  
**INRMP and EA for the Thomas B. Baker**  
**Training Facility**

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# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office

177 Admiral Cochrane Drive

Annapolis, MD 21401

March 5, 2001

Shannon Cauley  
Senior Ecologist  
The Louis Berger Group, Inc.  
1819 H Street, NW, Suite 900  
Washington, DC 20006

Re: Draft Integrated Natural Resources  
Management Plan and Environmental  
Assessment for the Brigadier General  
Thomas B. Baker Training Facility,  
Hancock, Maryland

Dear Mr. Cauley:

This letter is in response to your letter of January 30, 2001 requesting our comments on the draft Integrated Natural Resources Management Plan and Environmental Assessment for the Brigadier General Thomas B. Baker Training Facility (TBBTF), Hancock, Maryland dated January 2001.

The Service is supportive of the document's recommendations and concurs with the Plan for management of the 1,194-acre TBBTF. Maryland Army National Guard (MDARNG) primarily uses TBBTF for land navigation and mountaineering training exercises. These uses should be compatible with the natural resource management goals of the Plan provided they adhere to specifications of the lease agreement with the site's owner, Maryland Department of Natural Resources. In that agreement, a Restricted Use Area and a 100-meter buffer on both banks of Sideling Hill Creek are designed to restrict training activities so that sensitive habitats and species are avoided.

The Service strongly encourages continued coordination with this office on expanded surveys and management initiative information discussed in the Plan affecting our trust resource, the Federally endangered plant harperella (*Ptilimnium nodosum*). The individuals of this species present within TBBTF are a major segment of the most significant harperella population in Maryland. Sideling Hill Creek also supports the only significant population of the Federal species of concern, the green floater mussel (*Lasmigona subviridis*) in Maryland. Again, we encourage continued coordination with this office regarding surveys or management efforts affecting mussels within Sideling Hill Creek.

On page 3-50, line 28, please note that the green floater is a Federal species of concern, and not a Federally threatened species.

Thank you for the opportunity to comment. Any questions regarding Service recommendations should be addressed to Jason Miller of my staff at (410) 573-4522.

Sincerely,

A handwritten signature in black ink, appearing to read "John P. Wolflin". The signature is stylized with large, overlapping loops and a long horizontal stroke at the end.

for John P. Wolflin  
Supervisor  
Chesapeake Bay Field Office

cc: Ed Thompson - MDNR  
Donald Rohrback - MDNR



Parris N. Glendening  
Governor

**Maryland Department of Natural Resources**  
**'Wildlife & Heritage Division**  
*Natural Heritage & Wildlife Diversity*  
**April 4 2001**

Sarah J. Taylor-Rogers, Ph.D.  
Secretary

Shannon Cauley  
Senior Ecologist  
The Louis Berger Group, Inc.  
1819 H Street, NW  
Suite 900  
Washington, DC 20006

Dear Shannon,

This letter is to acknowledge my review of the Integrated Natural Resources Management Plan and Environmental Assessment for The Brigadier General Thomas B. Baker Training Facility. I commend you and your colleagues on the quality and thoroughness of the document.

I have only a few comments. Under Section 3.14.3 Reptiles and Amphibians (page 3-49) please note: We are not aware of any valid record for the Appalachian seal salamander (*Desmognathus monticola*) east of the Allegheny Front in Maryland, the boundary of which is the eastern edge of Dan's Mountain in western Allegany County. Also, unless you know of a valid, current record for the spotted turtle (*Clemmys guttata*) and the queen snake (*Regina septemvittata*) these reptiles should not be considered part of the local reptile fauna. In recent history, no spotted turtles have been documented west of central Washington County, and to our knowledge no queen snake records exist for the heart of the Ridge & Valley province.

In addition, since The Natural Heritage Program, per se, no longer exists I recommend that wherever this wording is used it be changed to The Natural Heritage and Wildlife Diversity Program.

Thank you for the opportunity to review this document.

Sincerely,

Ed Thompson  
Regional Natural Heritage Biologist



1 March 2001

**Maryland  
Department of  
Housing and  
Community  
Development**

*Division of Historical and  
Cultural Programs*

100 Community Place  
Crownsville, Maryland 21032

410-514-7600  
1-800-756-0119  
Fax: 410-987-4071  
Maryland Relay for the Deaf:  
1-800-735-2258

http: // [www.dhcd.state.md.us](http://www.dhcd.state.md.us)

Parris N. Glendening  
*Governor*

Raymond A. Skinner  
*Secretary*

Marge Wolf  
*Deputy Secretary*

Mr. Robert F. Gore  
Chief, Planning and Environmental Services Branch  
U.S. Army Corps of Engineers  
P. O. Box 1715  
Baltimore, MD 21203-1715

Re: Brigadier General Thomas B. Baker Training Facility, Allegany and  
Washington Counties, Maryland

Dear Mr. Gore:

Thank you for your letter of 31 January 2001 with the draft copy of the following document: Integrated Natural Resources Management Plan and Environmental Assessment 2001-2005, Brigadier General Thomas B. Baker Training Facility, Maryland Army National Guard (U.S. Army Corps of Engineers and The Louis Berger Group, January 2001). We are pleased that this document incorporates information on cultural resources which we forwarded to The Louis Berger Group on 13 January 2000.

We understand from Section 5.10 (Cultural Resources Management) that proposed activities are unlikely to involve ground disturbance or construction that would affect historic properties. Furthermore, the Army would comply with regulations of Section 106 of the National Historic Preservation Act if new projects were planned or if previously unknown cultural resources were discovered. We believe that these plans will serve to protect cultural resources, and we offer no changes to the submitted document.

If you have any questions or require further information, please contact Dr. Gary Shaffer (archeology, 410-514-7638) or Ms. Patricia Blick (structures, 410-514-7637).

Sincerely,

Elizabeth J. Cole  
Administrator  
Project Review and Compliance

EJC/GDS/PMB/200100283



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**APPENDIX G**  
**Implementation Time Frames For**  
**Management Measures and Projects**  
**Prescribed in the INRMP**

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<b>Appendix - G</b>	
<b>Implementation Time Frames for Management Measures and Projects Prescribed in the INRMP</b>	
<b>Resource Area: Soils</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>▪ Initiate a soil erosion program to establish baseline conditions and to determine where erosion and associated sedimentation are occurring. Use the results of monitoring to determine locations where management practices should be implemented to rehabilitate affected resources.</li> </ul>	FY01 (Spring)
<ul style="list-style-type: none"> <li>▪ Repair roads where they are heavily eroded, and implement best management practices where necessary to minimize future erosion and associated sedimentation.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>▪ Place large rock in the ditch along the access road, where needed, from the Lookout Site to the Administration House to disperse runoff flow on steep slopes and reduce the potential for down-cutting, severe erosion and resultant downstream water quality impacts.</li> </ul>	FY01 (Spring)
<ul style="list-style-type: none"> <li>▪ Restrict the use of the road from Tabler Lodge to Sideling Hill Creek during and immediately following heavy rain, to minimize the potential for erosion and sedimentation and potential resultant water quality impacts to Sideling Hill Creek.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Place stone in the established roadway, parking sites, and along access paths at the mountaineering rappelling site to reduce potential for the development of erosion problems in the area. Boarder the established access road and parking sites with railroad ties to keep vehicles within designated areas. Install a gate to limit access. Reestablish understory vegetation in the area, where possible, with native vegetation.</li> </ul>	FY01 (Summer)
<ul style="list-style-type: none"> <li>▪ At the Potomac Overlook amend soils and establish native understory vegetation, where possible, to reduce the potential for erosion in the area.</li> </ul>	FY01 (Spring)
<ul style="list-style-type: none"> <li>▪ Monitor the facility road system on a regular basis to ensure that washouts are identified in a timely manner to minimize potential damage from erosion and resultant deposition of sediments.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Limit traffic in vegetated areas, especially where the vegetation is crucial to stabilizing soils from erosion.</li> </ul>	FY 01-05

<ul style="list-style-type: none"> <li>▪ When the exposure of soils is necessary to accomplish mission objectives, whether for military training or for other activities, use soil conservation measures (e.g., check dams, silt fences, diversions) to control erosion, sedimentation, and dust. To limit land maintenance expenditures and minimize environmental impacts, site physically intensive land-disturbing activities, when possible, on the least erodible lands (those requiring the least cover for erosion control). The potential erodibility of a site (as determined from existing soil types, slopes, and vegetative cover) and the location of adjacent wetlands, or other surface waters, will be identified and considered in order to minimize impacts on these resources. Implement erosion and sediment controls where appropriate. Maintain protective vegetative cover over all compatible areas, especially on steep slopes. Other materials, such as gravel, fabrics, mulch, riprap, or other materials that are environmentally safe and compatible with the location, may be used, as appropriate, for control of erosion in problem areas.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Monitor soil erosion on a regular basis, especially following damaging events such as heavy rains, high winds, or excess trafficking (training operations). Monitoring of potential erosion areas will allow early detection of problem areas.</li> <li>▪ Based on the results of monitoring, rehabilitate vegetation and soils in areas where they have been impacted by training or other activities in a timely manner to reduce the potential for the development of excessive erosion or sedimentation sites.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>• Conduct an evaluation of the TBBTF road system with the objective of establishing a system that meets installation needs, is cost-effective to maintain, and contributes the least amount of erosion possible. Roads will be evaluated as to their location with regard to environmental damage, especially erosion. The road evaluation project will result in a list of roads to be repaired, restricted for use, or closed.</li> </ul>	FY 01
<ul style="list-style-type: none"> <li>• The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of soil management practices that require terrain alteration. Soil management and conservation activities that result in terrain modification for erosion control or other management objectives must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with soil management</li> </ul>	FY 01-05

<p>activities may be generated under the National Historic Preservation Act (NHPA), NEPA, the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA) and EO 13007 (also see Section 5.10).</p>	
<p><b>Resource Area: Water Resources</b></p>	
<p><b>Management Measure/Project</b></p>	<p><b>Time Frame</b></p>
<ul style="list-style-type: none"> <li>■ Monitor water bodies. Conduct routine (biannual) water quality sampling/monitoring on Sideling Hill Creek where it flows onto TBBTF and upstream of the boundary where it flows off of the facility. This will help to prevent potential degradation of water quality on TBBTF from going unnoticed. Frequent water quality monitoring provides a mechanism for the early detection of potential problems and makes it easier to identify the source/cause of the degradation. The data also provides the foundation from which to make future management decisions.</li>   <li>■ Conduct water sampling and analysis as necessary if visual or olfactory indicators of water quality degradation are observed. This will enable early detection of potential water quality problems and make it easier to identify the source/cause of the degradation. If it is determined that water quality degradation is/has occurred, implement best management practices appropriate to mitigate the problem in a timely manner.</li>   <li>■ Conduct routine (annual) screening level watershed assessments on TBBTF to evaluate the potential for adverse impacts to water bodies both on and off of the facility. The assessments will evaluate surrounding land uses and identify potential sources of point and nonpoint source pollutant loadings to water bodies on TBBTF.</li>   <li>■ Based on the results of the screening level watershed assessments, identify potential sources of pollutant loadings to water bodies on TBBTF and identify and prioritize management measures to minimize adverse impacts to water quality and aquatic habitats.</li>   <li>■ Remove the trash (appliances, bicycles, etc.) from Sideling Hill Creek located just upstream of the of the Boy Scout Barren.</li>   <li>■ Monitor water bodies on TBBTF on a regular basis for illegal dumping. If dump areas or accumulations of litter are discovered remove the trash and dispose of it properly to reduce the potential</li> </ul>	<p>FY 01-05 (biannual basis or more frequently if conditions warrant)</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY01</p> <p>FY 01-05 (minimum quarterly basis)</p>

<p>for adverse impacts to water quality and habitats.</p>	
<ul style="list-style-type: none"> <li>■ Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the Restricted Use Area (RUA) established in the lease agreement between MDARNG and DNR.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Continue to prohibit the cutting or clearing of vegetation within the 100-meter buffer to Sideling Hill Creek and the RUA.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Limit use of herbicides for exotic invasive plant species control in areas adjacent to water bodies on TBBTF. Where it is determined that use of herbicide is the only viable approach for control of invasive plants, application should be made by personnel trained in their proper use. Minimum offsets of 30 feet should be maintained from water bodies for use of herbicides and application should be directed specifically at target species. Herbicides used in areas adjacent to water bodies should be limited to those that do not migrate in the soil and that do not persist for an extended time after application (i.e. glyphosate).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Turf management chemicals for TBBTF landscape maintenance will be applied minimally, only when specific problems are identified, and in conformance with appropriate standards. Turf management chemicals will not be applied in areas immediately adjacent to the manmade pond. Due to slopes adjacent to the pond, a 100-foot buffer restricting the use of turf management chemicals should be maintained around the pond. No turf management chemicals will be applied within the 100-meter buffer on Sideling Hill Creek or the RUA.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Pesticides and fertilizers will be applied in conformance with appropriate standards, and should not be used within 100 feet of the manmade pond, tributaries to Sideling Hill Creek, or within the 100-meter buffer to Sideling Hill Creek or the RUA.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Maintain offsets from drainageways or intermittent streams on TBBTF that originate or flow through activity areas, or along roadways, (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek, or downstream waterways, resulting from accidental fuel or chemical spills.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Pollution prevention will be practiced when vehicles are on facility roads.</li> </ul>	FY 01-05

<b>Resource Area: Wetlands</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Develop a wetland inventory and assessment database by compiling additional information on the wetlands identified in the reconnaissance study. The geologic, hydrologic, and biological characteristics of the identified wetlands will be recorded. Important characteristics to be recorded include wet and dry periods, additional information on major plant communities and composition, observed wildlife species, and periods of use by wildlife. The goal of this management measure is to develop a database that will enable management and use decisions to be made in a manner that will minimize potential impacts to wetland habitats on TBBTF. The database will be used to track wetland conditions on TBBTF and to assist in the identification of potential problem areas.</li> </ul>	FY 01-05 (begin in Spring of 01) (Spring)
<ul style="list-style-type: none"> <li>■ Maintain a minimum of a 100-foot buffer around wetlands. Limit activities within buffer zones to those that would cause little or no impact on, or disturbance to, the wetlands. The locations of most of the wetlands identified on TBBTF are within the Sideling Hill Creek 100-meter buffer zone so additional buffer requirements should not be necessary.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Plan training exercises to avoid wetland impacts to the maximum extent possible and mitigate unavoidable impacts on wetland functions.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Review operations and maintenance programs that potentially affect wetlands, and develop procedures and guidelines to avoid the loss of wetland functions.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>■ Evaluate general vegetative characteristics of wetlands to determine where potential future control of invasive species could result in measurable habitat value enhancement.</li> </ul>	FY01 (Spring/ Summer)
<b>Resource Area: Vernal Pools</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Identify and document the location of vernal pools in the abandoned wet pasture below Ziegler Road Bridge. Identify vernal pools based on criteria established by the State of Maryland.</li> </ul>	FY01 (Spring)
<ul style="list-style-type: none"> <li>■ Record the geologic, hydrologic, and biological characteristics of</li> </ul>	FY 01-02

<p>the inventoried vernal pools. Important characteristics to be recorded include wet and dry periods, major plant communities (if any) and composition, observed wildlife species, and periods of use by wildlife.</p> <ul style="list-style-type: none"> <li>■ Maintain 100-foot buffers around inventoried vernal pool habitats. The locations of known vernal pools on TBBTF are included in the areas designated as wetlands and are within the Sideling Hill Creek 100-meter buffer zone so additional buffer requirements should not be necessary. Activities within the buffer zone should be restricted to those that would cause little or no disturbance to the vernal pools, especially during wet periods.</li> </ul>	<p>FY 01-05</p>
<p><b>Resource Area: Riparian Habitats</b></p>	
<p><b>Management Measure/Project</b></p>	<p><b>Time Frame</b></p>
<ul style="list-style-type: none"> <li>■ Continue to restrict general access to, and use of, the 100-meter buffer area on both banks of Sideling Hill Creek.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Continue to limit access and use of the RUA established in the lease agreement between MDARNG and DNR.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Inventory the stream crossing for light infantry training on Sideling Hill Creek to determine the current extent of microstegium (<i>Microstegium vimineum</i>) in the area. Data gathered in the 1996 inventory conducted by the USGS should be used, where possible, to determine recent historic presence of microstegium at the stream crossing. This data can be compared with the current inventory to determine recent spread of microstegium. Mechanically remove microstegium from the stream crossing area and in an area 50 meters upstream and downstream of the crossing on both banks of Sideling Hill Creek. The microstegium will be mechanically removed after it has flowered, but before its seeds become viable (August to October) to ensure that new seed stock associated with plant removal is not supplied to the soil. Removal of the microstegium will be conducted under the supervision of a botanist (or other person with suitable knowledge of plant species in the area) to ensure that sensitive or protected plant species that may be present within or adjacent to the microstegium populations are not adversely impacted.</li> </ul>	<p>FY 01 (initial inventory-Summer)</p> <p>FY 01-05 (invasive removal)</p>
<ul style="list-style-type: none"> <li>■ Use a bush hog or weedeater to manage microstegium occurring on the roadway approach to Sideling Hill Creek on both sides of the stream crossing for light infantry training. Mowing will be conducted after the microstegium has flowered, but before its seeds become viable. Mowing will be required on a yearly basis</li> </ul>	<p>FY 01-05</p>

for up to seven years due to the long seed bank viability of microstegium. Remove pioneer plants in the adjacent woods and those occurring in the creek bed by hand. Yearly monitoring of microstegium in, and adjacent to, the roadway will be conducted to determine if mowing effectively contains the spread, or over time reduces the extent, of the species. If it is determined that mowing does not effectively control microstegium in the roadway at the crossing, management will be adapted and other methods for controlling the species will be evaluated and implemented for control. Continued yearly monitoring will be used to evaluate the success of the control efforts and determine if further modifications are necessary.

- Monitor the approach to the stream crossing on both sides of Sideling Hill Creek to determine if using the crossing is resulting in the spread of microstegium along and adjacent to the training trails. Any spread of microstegium associated with the stream crossing will be addressed in a timely manner to ensure that spread of the species is minimized. Mechanical removal of the grass should be conducted after the plant has set flower but before the seeds become viable. Monitoring of the stream crossing and adjacent area should be conducted several times throughout the growing season so that any new spread of the species associated with the use of the stream crossing will be detected. Continue to mechanically remove microstegium from the stream crossing area and in the area 150 feet along and inland from the streambank upstream and downstream of the crossing along with any new spread of the grass associated with use of the crossing on an annual basis. Continue to monitor the stream crossing and adjacent areas for the spread of microstegium several times throughout the growing season on an annual basis.

FY 01-05  
(Summer/  
Fall)

- Hand pull garlic mustard occurring at the Sideling Hill Creek crossing for light infantry training and in the area 150 feet along and inland from the streambank upstream and downstream from the crossing. Monitor the area on an annual basis for the reoccurrence of garlic mustard and to determine if use of the crossing is resulting in the spread of garlic mustard. Hand pull garlic mustard occurring in the area on an annual basis. Removal of garlic mustard from the crossing area should be conducted in May-June. Plants that are pulled after flowering has occurred should be bagged and removed from the site.

FY 01-05

- Mechanically remove yellow day lily from the floodplain areas 150 feet upstream and downstream of the Sideling Hill Creek crossing for light infantry. Pitchforks or other similar tools

FY 01-05  
(late  
Spring)



<p>should be used for removal to ensure the bulbs of the day lily are also removed. Plants should be bagged and removed from the site following their removal. Monitor the area on an annual basis for the occurrence of yellow day lily and remove plants that reoccur.</p>	
<ul style="list-style-type: none"> <li>■ Remove bush honeysuckle on the west side of Sideling Hill Creek along the road approaching the crossing for light infantry. A well-established population of bush honeysuckle occurs in an approximately 1+acre area along the road. Assess the extent of the bush honeysuckle population and direct initial efforts for removal on plants occurring in the woods around the parameter of the main population. Mechanical methods should be implemented for removal of bush honeysuckle from the area. Monitor on an annual basis to determine the success of management and remove any plants that become reestablished in the area. Monitoring should be conducted in early spring because early leaf out of the plant makes its identification easier at this time of year.</li> </ul>	<p>FY 01 (initial inventory and removal-early spring)</p> <p>FY 02-05 (monitor and additional removal)</p>
<ul style="list-style-type: none"> <li>■ The use of the Sideling Hill Creek crossing will be limited to light infantry foot traffic during training activities. No vehicles or machinery will use the Sideling Hill Creek crossing for transportation or for any other reason except for in response to actual emergencies.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Monitor and maintain the stream crossing for light infantry to ensure that streambank erosion and associated water quality and aquatic habitat impacts do not occur as a result of using the crossing. Apply environmentally compatible best management practices, if necessary, to minimize streambank, water quality, and aquatic habitat degradation at the crossing.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Chemicals and fertilizers will not be applied in the mowed riparian area adjacent to the Ziegler Road Tributary to Sideling Hill Creek.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Remove trash from the riparian area along Ziegler Road, where it runs adjacent to the intermittent tributary to Sideling Hill Creek on a regular, as needed, basis to prevent it from entering the water body and impacting water quality and habitat in the tributary and in Sideling Hill Creek.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Maintain wooded riparian areas along the intermittent streams on TBBTF that flow into Sideling Hill Creek. Limit activities in the riparian areas adjacent to the intermittent streams to those that will cause minimal, or no impacts to riparian vegetation or streambanks.</li> </ul>	<p>FY 01-05</p>

<b>Resource Area: Aquatic Habitats</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Conduct physical habitat assessments to evaluate the integrity and conditions of stream reaches, instream habitat, and riparian areas along Sideling Hill Creek and its tributaries on TBBTF. Screening level assessments can be used to evaluate overall conditions, prioritize restoration projects (if any), and allocate resources.</li> </ul>	FY 01-05 (late spring and following flood events)
<ul style="list-style-type: none"> <li>■ Based on the results of the habitat assessment, identify and prioritize reaches in need of restoration efforts (if any).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Maintain aquatic species diversity by preserving natural systems both in and adjacent to water bodies on TBBTF. At TBBTF these natural systems include wetlands, riparian areas, and the sensitive and significant habitats located in or adjacent to the water bodies. Implementing use restrictions in the 100-meter buffer zone and RUA will help to ensure that natural systems along Sideling Hill Creek are preserved. Additional management measures prescribed under Water Resources, Riparian Habitats, Sensitive and Significant Habitats, and Pest Management will further help to ensure that natural systems are preserved in and adjacent to Sideling Hill Creek. Tributaries to Sideling Hill Creek outside of the 100-meter buffer zone and RUA, in particular, the tributary adjacent to Ziegler Road will be assessed to determine the potential for preserving or enhancing natural conditions in and adjacent to the stream.</li> </ul>	FY 01-05
<b>Resource Area: Terrestrial Habitats</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Protect natural areas, especially sensitive and significant habitats. Continue to implement use restrictions designed to protect flora and fauna on TBBTF as established in the Lease Agreement and the SOP. Specific management measures established in the Lease Agreement include:  In the General Use Area (areas outside of the RUA and the 100-meter buffer to Sideling Hill Creek): restrict use of motor vehicles to designated roads and parking areas; and no cutting or clearing of trees or other vegetation except as necessary for disease or invasive species control.  In the RUA: no rappelling (except in the area approved for</li> </ul>	FY 01-05

<p>rappelling on the eastern end of Straus Barren); no use of motorized vehicles except as needed in emergencies; no construction of any kind; no training in areas containing shale barrens (except at the approved rappelling site) or threatened and endangered species; no overnight camping or camp fires; and no clearing or cutting of trees or vegetation except as necessary for disease or invasive species control.</p>	
<ul style="list-style-type: none"> <li>▪ Restrict access to, and use of, the 100-meter buffer on both sides of Sideling Hill Creek. Training activities are minimized within the 100-meter buffer. See the riparian area management measures regarding access and use of the Sideling Hill Creek Crossing.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Develop SOP fact sheets (guidelines) that address environmental issues and safety on TBBTF. The fact sheets will show the Restricted Use Area, 100-meter buffer to Sideling Hill Creek and Sensitive and Significant Habitats on TBBTF. Allowed uses and use restrictions will be presented in the fact sheets. The fact sheets will be posted at permanent locations including the Baker Building, adjacent to the parking area for Straus Lodge, and at other appropriate locations, if determined to be useful.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>▪ Continue to require and conduct advanced briefing of training units regarding environmental protection, land uses, and use restrictions.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Allow snags and dead trees to remain standing where they are not causing a threat to personal safety or structures on TBBTF. In particular, hollow butt trees and trees with holes in their bole for habitat will be left standing where they do not cause a safety threat.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Snags and dead trees will be removed if they endanger personnel, roadways, power or phone lines, buildings, training structures, or if they interfere with landscape objectives.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Maintain coarse woody debris and fallen logs on the forest floor where they do not pose a significant obstacle to training activities or are not a potential fire hazard.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Where suitable conditions exist, and it is cost effective and practical, TBBTF will use regionally native plant species in landscaping and maintenance projects. TBBTF will use non-invasive plant species in landscaping and maintenance projects wherever a native alternative is not possible.</li> </ul>	FY 01-05

<ul style="list-style-type: none"> <li>■ Evaluate the viability of establishing a wildlife meadow in the mowed area behind (east end) the Baker Building. Use someone knowledgeable and experienced in the establishment and maintenance of wildlife meadows in the local region to evaluate the potential for establishing the meadow. If it is determined that a wildlife meadow can be established and maintained at this location, then implement the action of planting the meadow. Use someone who has local experience in planting and establishment of wildlife meadows to plan and conduct oversight for the project. Use a mix of native warm season grasses and wildflowers (if viable) that is based on site conditions and the potential for successful establishment and long term maintenance. Avoid the use of seed mixes that contain exotic and potentially invasive plant seeds.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>■ Evaluate the viability of establishing a wildlife meadow in the mowed field at the Straus Lodge in the area adjacent to the manmade pond (southeast corner of the mowed field). If it is determined that a wildlife meadow can be established and maintained at this location, then implement the action of planting the meadow. Use someone who has local experience in planting and establishment of wildlife meadows to plan and conduct oversight for the project. Use a mix of native warm season grasses and wildflowers (if viable) that is based on site conditions and the potential for successful establishment and long term maintenance. Avoid the use of seed mixes that contain exotic and potentially invasive plant seeds.</li> </ul>	FY 02
<ul style="list-style-type: none"> <li>■ The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of terrestrial habitat management practices that require terrain alteration. Terrestrial habitat management and conservation activities that result in terrain modification, such as physical soil preparation for planting, must consider the potential for adverse impacts to cultural resources.. Cultural resources compliance requirements associated with terrestrial habitat management activities may be generated under the National Historic Preservation Act (NHPA), NEPA, the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA) and EO 13007 (also see Section 5.10).</li> </ul>	FY 01-05

<b>Resource Area: Sensitive and Significant Habitat Management</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Inform personnel training on, or otherwise using the facility, of the location and general characteristics of sensitive habitats that occur in the area of proposed training activities, and instruct to avoid potential adverse impacts to the areas. Trainers will be briefed on the presence and general locations of sensitive habitats on TBBTF and on use restrictions in the areas prior to training activities.</li> </ul>	FY 01-05
<p><b>Straus Barren</b></p> <ul style="list-style-type: none"> <li>■ Training and recreational access to the Strauss Barren, outside of the approved rappelling and mountaineering site, will be restricted. Access to the barren will be restricted to that necessary for monitoring or study, or for the management of invasive plant species, if determined to be necessary. Traversing of the shale barren will be avoided to minimize disturbances to the natural vegetation and to prevent potential impacts to state endangered, threatened and rare plants that occur on the barren.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Rappelling and mountaineering will be restricted to the approved area in the western section of the Straus Barren. Four training sites (fingers) have been approved. Training will be restricted to 1 or 2 of the 4 approved sites per year. Active sites will be rotated on a yearly basis. For example, 1 or 2 sites will be used for a training year, then training activities will be moved to the adjacent sites and use of the previously active sites will be restricted. Conditions on the resting sites will be monitored to determine if they re-stabilize and vegetation reestablishes if and where it was impacted during training activities. If monitoring indicates that the previously active fingers do not stabilize during the rest period, then restricting training activities to 1 or 2 permanently designated fingers will be considered. The training areas will be monitored on an annual basis and following training activities to ensure that damage that might occur (e.g. development of potential erosion sites) as a result of training is addressed in a timely manner.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ The extent and potential for control of invasive plant species on the Straus Barren will be assessed. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program indicated that great mullein (<i>Verbascum thapsus</i>) and microstegium (<i>Microstegium vimineum</i>) occurred on, or in the vicinity of, the Barren in 1995. Great mullein was observed on</li> </ul>	FY01 (spring/ summer)

the lower slopes of the Straus Barren during a site reconnaissance of TBBTF conducted in March 2000 (see measures for pest management).

### Boy Scout Barren

- Training and recreational access to the Boy Scout Barren will be restricted. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to the Boy Scout Barren. Access to the barren outside of use of the existing road will be restricted to that necessary for monitoring or study, or for the management of invasive plant species, if determined to be necessary. Traversing of the shale barren will be avoided to minimize disturbances to the natural vegetation and to prevent potential impacts to state endangered, threatened and rare plants that occur on the barren.

FY 01-05

- The extent and potential for control of invasive plant species on the Boy Scout Barren will be assessed. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 indicated that spotted knapweed (*Centaurea maculosa*) occurred along the side of the road that bisects the barren. Field surveys conducted for the development of the INRMP verified its occurrence along the road. Tree of heaven (*Ailanthus altissima*) also occurs along the road that bisects the barren. Barren brome, an invasive grass introduced from Europe, occurs on the upper slopes of the barren and is the most abundant exotic invasive plant occurring on the barren. Chickweed (*Stellaria media*) was also observed along the roadside during a site reconnaissance of TBBTF conducted in March 2000 (see Section 5.13.1.2 for management measures to address invasive species on TBBTF). Due to the sensitive nature of the Boy Scout Barren, efforts to manage and control invasive plant species on the barren will be coordinated with ongoing efforts of the Maryland Department of Natural Resources and The Nature Conservancy to control barren brome and other invasives on the Barren.

FY01  
(assessment)

FY 01-05  
(management  
implementation  
and monitoring)

### North Ridge

- Training and recreational access to the North Ridge will be restricted. Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the North Ridge area. Training and recreational use of the North Ridge area will be minimized to reduce the potential for disturbance of the natural vegetation on steep slopes and to prevent potential impacts to state threatened and rare plants that

FY 01-05

occur on the North Ridge.

**Ziegler Bridge Barren**

- Training and recreational access to the Ziegler Bridge Barren will be restricted. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of the Ziegler Bridge Barren. Training and recreational use of the Ziegler Bridge Barren will be restricted to reduce the potential for disturbance of the natural vegetation on steep slopes and to prevent potential impacts to rare plants that occur there.

FY 01-05

**North Central Floodplain**

- Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of the North Central Floodplain. Use restrictions are implemented to reduce the potential for disturbance of natural vegetation on the floodplain and adjacent slopes and to prevent potential impacts to rare plants that occur there.

FY 01-05

- Microstegium was identified on the upstream section of the floodplain approximately 1,000 feet downstream from the boundary of TBBTF during a site reconnaissance of facility conducted in March 2000. The area of microstegium is roughly estimated to be about 15,000 square feet, based on remains of the grass from the previous years growing season. The apparent limited extent of microstegium in this section of the Sideling Hill Creek floodplain, along with the presence of buffers both upstream and downstream of the observed occurrence, indicate that this apparently incipient population of the grass could be controlled and eventually eradicated if it is addressed in a timely manner. Microstegium spreads very rapidly so immediate action will be taken to address the occurrence. Garlic mustard was also identified in the vicinity of the microstegium occurrence and bush honeysuckle occurs as individual plants at several locations on the floodplain. Garlic mustard and bush honeysuckle will be removed as part of the activity to remove microstegium from the North Central Floodplain (see measures for pest management).

FY01  
(reassessment-  
Summer)  
FY 01-05  
(management  
implementation  
and monitoring)

- The inventory conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 identified day lily (*Hemmerocallis fulva*) on the North Central Floodplain. Reassess the floodplain for the occurrence and extent of day lily. Develop and implement a plan for the removal of the invasive plant species from the North Central Floodplain.

FY01  
(assessment in  
late spring)  
FY 01-05  
(management  
implementation  
and monitoring)

<p><b>South Central Ridge and Floodplain</b></p> <ul style="list-style-type: none"> <li>■ Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the South Central Ridge and Floodplain. Limit training on the South Central Ridge and Floodplain to reduce potential for disturbance of natural vegetation on the floodplain and adjacent slopes and to prevent potential impacts to rare plants and the tiger beetle (<i>Cicindela ancocisconensis</i>) recorded to occur on the floodplain.</li> <li>■ Maintain barriers to restrict access to the ford at Sideling Hill Creek.</li> <li>■ Restrict access by motorized and non-motorized vehicles to the fire road that traverses the site.</li> <li>■ Wood's sedge (<i>Carex tetanica</i> var. <i>woodii</i>), a state endangered plant species, was reported to occur along the fire road in the inventory conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995. Prior to conducting maintenance on the fire road, characterization of the area will be conducted by an endangered species biologist to ensure that the sedge will not be adversely impacted by proposed activities.</li> </ul>	<p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05 (as needed prior to maintenance activities)</p>
<p><b>Mouth of Sideling Hill Creek - Floodplain/Barren</b></p> <ul style="list-style-type: none"> <li>■ The mouth of Sideling Hill Creek-Floodplain/Barren, inside the boundaries of TBBTF, is within the RUA and the 100-meter buffer to Sideling Hill Creek. Use restrictions applicable to the RUA and the 100-meter buffer apply to the Mouth of Sideling Hill Creek-Floodplain/Barren. Training in the area will be restricted to reduce potential for disturbance of natural vegetation on the floodplain and adjacent shale barrens and to prevent potential impacts to rare plants that have been recorded to occur in the habitats.</li> <li>■ The extent and potential for control of invasive plant species on the Mouth of Sideling Hill Creek-Floodplain/Barren will be assessed. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program indicated that microstegium occurred on the site in 1995 (see measures for pest management).</li> </ul>	<p>FY 01-05</p> <p>FY01 (assessment) FY 01-05 (management implementation and monitoring)</p>
<p><b>Sideling Hill Creek</b></p> <ul style="list-style-type: none"> <li>1 ■ Training activities in and adjacent to Sideling Hill Creek will be</li> </ul>	<p>FY 01-05</p>



<p>restricted. Use restrictions applicable to the RUA and the 100-meter buffer to Sideling Hill Creek apply to all of Sideling Hill Creek within the boundaries of TBBTF. Training in, and immediately adjacent to, Sideling Hill Creek will be restricted to reduce the potential for disturbance of aquatic habitats and several sensitive flora and fauna that occur there. The creek supports one of the largest remaining populations of the federally endangered plant harperella (<i>Ptilimnium viviparum</i>). The creek also supports several sensitive fauna including the state endangered tiger beetle (<i>Cicindela ancocisconensis</i>) and the state endangered green floater mussel (<i>Lasmigona subviridis</i>).</p> <ul style="list-style-type: none"> <li>■ Monitor water quality in Sideling Hill Creek (see Water Resources management measures for monitoring water quality in Sideling Hill Creek).</li> <li>■ Conduct water sampling and analysis as necessary if visual or olfactory indicators of water quality degradation are observed (see Water Resources management measures for monitoring water quality on Sideling Hill Creek).</li> <li>■ Maintain offsets from drainageways or intermittent streams that originate or flow through activity areas, or along roadways (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek resulting from accidental fuel or chemical spills.</li> <li>■ Conduct routine (annual) screening level watershed assessments on TBBTF to evaluate the potential for adverse impacts to water quality in Sideling Hill Creek resulting from point and nonpoint source pollution (also see water resources management measures).</li> <li>■ Maintain barriers to restrict access to the ford across Sideling Hill Creek in the South Central Ridge and Floodplain.</li> <li>• Crossing of Sideling Hill Creek during training operations will be limited to the designated stream crossing for light infantry training. Crossing of the creek during training operations will be limited to foot traffic. No vehicles or machinery will use the Sideling Hill Creek crossing for transportation or for any other reason except for in response to actual emergencies.</li> <li>■ The extent and potential for control of invasive plant species that</li> </ul>	<p>FY 01-05 (biannual basis or more frequently if conditions warrant)</p> <p>FY 01-05</p> <p>FY01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-02 (assessment)</p>
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<p>occur in and along Sideling Hill Creek will be assessed. Microstegium occurs along most of Sideling Hill Creek within the boundaries of TBBTF. Studies conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 also indicated that <i>Arthraxon (Arthraxon hispidus)</i> occurred along Sideling Hill Creek in lesser numbers mixed in with the microstegium (see measures for pest management).</p>	<p>FY 01-05 (management implementation and monitoring)</p>
<ul style="list-style-type: none"> <li>■ Continue to block access to the dirt road on the east side of Ziegler Road just to the north of the Ziegler Road bridge to restrict access to potential stream crossings by off road motorized and non motorized vehicles.</li> </ul>	<p>FY 01-05</p>
<p><b>North Creek Access</b></p>	
<ul style="list-style-type: none"> <li>■ The North Creek Access lies partially within the 100-meter buffer to Sideling Hill Creek. Use restrictions applicable to the 100-meter buffer apply to the northern third of the North Creek Access.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Assess the extent and potential for control of invasive plant species in the North Creek Access area. The survey conducted by the Maryland Natural Heritage and Wildlife Diversity Program in 1995 indicated that the exotic invasive plant species microstegium and multiflora rose (<i>Rosa multiflora</i>) occurred in the North Creek Access area (see measures for pest management).</li> </ul>	<p>FY01 (assessment) FY 01-05 (management implementation and monitoring)</p>
<p><b>Big Pool Face and Vicinity</b></p>	
<ul style="list-style-type: none"> <li>• Training activities will be restricted in the Big Pool Face and Vicinity. Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the Big Pool Face and Vicinity. Training activities and use of the Big Pool Face and Vicinity area will be minimized to reduce the potential for disturbance of the natural vegetation on rock faces and steep slopes and to prevent potential impacts to state threatened and rare plants that occur in the area.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>• Training activities such as climbing or rappelling on the rock outcrops, or any other activity that could destabilize rocks or sensitive plant communities growing in the crevices or on ledges will be restricted on the Big Pool Face.</li> </ul>	<p>FY 01-05</p>
<p><b>Little Barren</b></p>	
<ul style="list-style-type: none"> <li>• Restrict training and recreational activities on the Little Barren. Use restrictions applicable to the RUA and the 100-meter buffer</li> </ul>	<p>FY 01-05</p>

to Sideling Hill Creek apply to all of the Little Barren.	
<b>Lower Sideling Hill Creek Floodplain and East Slopes</b>	
<ul style="list-style-type: none"> <li>■ Restrict training activities in the Sideling Hill Creek Floodplain and East Slopes. Use restrictions applicable to the RUA apply to all of the area and the 100-meter buffer to Sideling Hill Creek applies to most of the area. Training and recreational use of the Sideling Hill Creek Floodplain and East Slopes area will be minimized to reduce the potential for disturbance of the natural vegetation and to prevent potential impacts to state threatened, endangered and rare plants that occur on the floodplain and adjacent slopes.</li> </ul>	FY01-05
<ul style="list-style-type: none"> <li>■ Training activities and other uses within the Sideling Hill Creek Floodplain and East Slopes will avoid wetlands and vernal pools that occur on the site. Prior to conducting any activities with the potential to adversely impact wetlands or vernal pools, an assessment of the potential impacts will be conducted and alternatives that will avoid the impacts will be considered and, where possible and consistent with the military mission, implemented.</li> </ul>	FY 01-05
<b>Carex Fire Slope</b>	
<ul style="list-style-type: none"> <li>■ Conduct annual monitoring to track plant species succession on the Carex Fire Slope. Current vegetation on the Carex Fire Slope will be compared with similar adjacent unburned habitats to establish a general characterization of plant reestablishment and succession from the occurrence of the fire (1993) until present (see measures for fire management).</li> </ul>	FY 01-05
<b>Northeast Woodlands</b>	
<ul style="list-style-type: none"> <li>■ No management measures specific to the Northeast Woodlands are prescribed. See terrestrial habitat management for management measures applicable to the Northeast Woodlands.</li> </ul>	
<b>Resource Area: Wildlife Management</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Open areas associated with the maintenance and administrative areas and the field surrounding Strauss Lodge will be maintained to provide non-forest and edge habitat for white tailed deer (<i>Odocoileus virginianus</i>). In addition, the preservation of existing edge and transitional habitats will provide habitat for</li> </ul>	FY 01-05

<p>many bird species and other larger wildlife that utilize the habitats due to the close association of cover and forage areas.</p>	
<ul style="list-style-type: none"> <li>■ Record and report sightings of black bear (<i>Ursus americanus</i>) to the DNR.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Activities of beaver (<i>Castor canadensis</i>) in the southeastern corner of TBBTF along Sideling Hill Creek, and at other locations, if they are determined to be present, will be monitored for potential adverse impacts to sensitive habitats. At present, no management is prescribed for beaver on TBBTF. If it is determined that beaver activity may be causing adverse impacts to sensitive or protected species on the facility, then approaches for their management (e.g. live trapping and relocation) will be considered. Specifically, changes in water levels caused by beaver activities that could potentially adversely impact harperella (<i>Ptilimnium viviparum</i>) will be monitored.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Maintain aquatic species diversity by preserving natural systems both in and adjacent to water bodies on TBBTF. At TBBTF these natural systems include wetlands, riparian areas, and the sensitive and significant habitats located in or adjacent to the water bodies. Implementing use restrictions in the 100-meter buffer zone and RUA will help to ensure that natural systems along Sideling Hill Creek are preserved.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Allow snags and dead trees to remain standing where they are not causing a threat to personal safety or structures on TBBTF. In particular, hollow butt trees and trees with holes in their bole for habitat will be left standing where they do not cause a safety threat (also see management measures for terrestrial habitats).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Maintain coarse woody debris and fallen logs on the forest floor where they do not pose a significant obstacle to training activities or are not a potential fire hazard (also see management measures for terrestrial habitats)</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ The applicability and viability of installing nest boxes at locations on TBBTF for target species (e.g. wood ducks (<i>Aix Sponssa</i>) eastern bluebird (<i>Sialia sial is</i>), etc.) will be evaluated. If appropriate areas are located with the potential to attract target species, then nest boxes will be installed. Where appropriate, predator guards will be installed on the boxes. Boxes will be inspected annually for use. Additional boxes may be installed where monitoring determines that use is high. When it is determined that boxes are not being used, they will be relocated</li> </ul>	FY01 (assessment) FY 01-02 (nest box installation) FY 01-05 (monitoring)

<p>as necessary to attract use by the targeted species.</p> <ul style="list-style-type: none"> <li>▪ Use regionally native plant species in landscaping and maintenance projects where suitable conditions exist, and it is cost effective and practical. TBBTF will use non-invasive plant species in landscaping and maintenance projects wherever a native alternative is not possible.</li> <li>▪ Evaluate the viability of establishing a wildlife meadow in the mowed area behind (east end) the Baker Building (see management measures for terrestrial habitats on TBBTF).</li> <li>▪ Evaluate the viability of establishing a wildlife meadow in the mowed field at the Straus Lodge in the area adjacent to the water supply pond (southeast corner of the mowed field) (see management measures for Terrestrial Habitats on TBBTF).</li> </ul>	<p>FY 01-05</p> <p>FY01</p> <p>FY 02</p>
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**Resource Area: Fisheries Management**

<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>▪ Survey the fish population in the manmade pond to determine size, structure, and biological integrity of the fish communities. Survey results will be used to determine if management efforts are necessary to balance fish populations and diversity in the pond.</li> </ul>	<p>FY01</p>
<ul style="list-style-type: none"> <li>▪ Prohibit the use of live fish for bait in the manmade pond to avoid unwanted species introduction.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>▪ Monitor water bodies (see Water Resources management measures for monitoring water quality on Sideling Hill Creek).</li> </ul>	<p>FY 01-05 (biannual basis or more frequently if conditions warrant)</p>
<ul style="list-style-type: none"> <li>▪ Conduct water sampling and analysis as necessary if visual or olfactory indicators of water quality degradation are observed (see Water Resources management measures for monitoring water quality on Sideling Hill Creek).</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>▪ Conduct routine (annual) screening level watershed assessments on TBBTF to evaluate the potential for adverse impacts to water bodies both on and off of the facility (also see water resources management measures). The assessments will evaluate surrounding land uses and identify potential sources of point and</li> </ul>	<p>FY 01-05</p>

<p>nonpoint source pollutant loadings to water bodies on TBBTF.</p> <ul style="list-style-type: none"> <li>■ Based on the results of the screening level watershed assessments, identify potential sources of pollutant loadings to water bodies on TBBTF and identify and prioritize management measures to minimize adverse impacts to water quality and aquatic habitats (also see water resources management measures).</li> <li>■ Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the Restricted Use Area (RUA) established in the lease agreement between MDARNG and DNR.</li> <li>■ Turf management chemicals for TBBTF landscape maintenance will be applied minimally, only when specific problems are identified, and in conformance with appropriate standards. Turf management chemicals will not be applied in areas immediately adjacent to the manmade pond. Due to slopes adjacent to the pond, a 100-foot buffer restricting the use of turf management chemicals should be maintained around the pond. No turf management chemicals will be applied within the 100-meter buffer on Sideling Hill Creek or the RUA.</li> <li>■ Pesticides and fertilizers will be applied in conformance with appropriate standards, and should not be used within 100 feet of the manmade pond, tributaries to Sideling Hill Creek, or within the 100-meter buffer to Sideling Hill Creek or the RUA.</li> <li>■ Maintain offsets from drainageways or intermittent streams on TBBTF that originate or flow through activity areas, or along roadways, (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek, or downstream waterways, resulting from accidental fuel or chemical spills.</li> <li>■ Maintain fisheries diversity by preserving natural systems both in and adjacent to water bodies on TBBTF. At TBBTF these natural systems include wetlands, riparian areas, and the sensitive and significant habitats located in or adjacent to the water bodies. Implementing use restrictions in the 100-meter buffer zone and RUA will help to ensure that natural systems along Sideling Hill Creek are preserved.</li> </ul>	<p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p>
<p><b>Resource Area: Rare, Threatened and Endangered Species Management</b></p>	
<p><b>Management Measure/Project</b></p>	<p><b>Time Frame</b></p>
<ul style="list-style-type: none"> <li>■ Inform personnel training on, or otherwise using the facility, of</li> </ul>	<p>FY 01-05</p>

<p>the potential presence of sensitive species in training areas, and instruct to avoid potential species locations when feasible. Trainers will be briefed on the presence and general locations of sensitive plant species and habitats on TBBTF prior to training activities. Trainers will be instructed to avoid these areas, when feasible, during training activities.</p>	
<ul style="list-style-type: none"> <li>• Prioritize consideration of invasive species management in areas where it is determined that known existing sensitive plant species are in danger of adverse effects from their presence (see measures for pest management).</li> </ul>	FY01
<ul style="list-style-type: none"> <li>■ Monitor microstegium populations along Sideling Hill Creek to determine if the grass is directly competing with sensitive plant species along the creek. Areas where microstegium is determined to be directly competing with sensitive plants will be targeted as priority sites for removal of the invasive grass (see measures for pest management).</li> </ul>	FY 01-05
<p><b>Harperella (<i>Ptilimnium viviparum</i>) - Federally Endangered</b></p>	
<ul style="list-style-type: none"> <li>■ Coordinate with USFWS, DNR and TNC to ensure that natural resources management activities are consistent with current and past conservation and monitoring efforts by the agencies for harperella on TBBTF.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>■ On an annual basis and following agency monitoring activities coordinate with the agencies to determine the current extent and locations of harperella on Sideling Hill Creek within the boundaries of TBBTF. Documenting current locations of harperella on TBBTF will further ensure that management and other activities adjacent to Sideling Hill Creek do not adversely effects harperella populations on the facility.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Implement training and use restrictions in and immediately adjacent to Sideling Hill Creek. Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the Restricted Use Area (RUA) established in the lease agreement between MDARNG and DNR (see Figure 2-1).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Inform personnel training on, or otherwise using the facility, of the presence of harperella in Sideling Hill Creek. Trainers will be informed that the plant is present in and along the floodplain of Sideling Hill Creek and that crossing of the creek or training activities in the creek are restricted. Instream crossing of the</li> </ul>	FY 01-05

<p>creek during training activities will be limited to the approved Sideling Hill Creek Crossing for light infantry training on a prearranged basis. Trainers will be briefed on the presence of harperella prior to training activities.</p>	
<ul style="list-style-type: none"> <li>■ Coordinate with agencies (DNR, TNC) currently conducting monitoring of harperella on Sideling Hill Creek within the boundaries of TBBTF to expand efforts to include the entire length of the creek within the facility.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>■ Monitor microstegium in and along Sideling Hill Creek to determine if the invasive grass is adversely affecting harperella populations on the creek.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Activities to control microstegium and other exotic invasive species along Sideling Hill Creek will be prioritized based on potential adverse impacts to harperella (see measures for pest management).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Continue to enforce land use and access restrictions in the 100-meter buffer on both banks of Sideling Hill Creek. Limit access and activities in the Restricted Use Area (RUA) established in the lease agreement between MDARNG and DNR (see Figure 2-1).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Offsets from drainageways and intermittent streams on TBBTF that originate or flow through activity areas, or along roadways, will be maintained (where possible) to reduce the potential for water quality degradation in Sideling Hill Creek, or downstream waterways, resulting from accidental fuel or chemical spills.</li> </ul>	FY 01-05
<p><b>State Listed Fauna</b></p>	
<ul style="list-style-type: none"> <li>■ Known habitats and locations of state listed fauna on TBBTF will be protected from adverse impacts associated with training, general use, and the implementation of natural resources management activities.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Access and use restrictions in the RUA and 100 meter buffer to Sideling Hill Creek will continue to be implemented.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Known populations of state listed fauna species will be monitored to detect long term changes in the status of populations on TBBTF.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Water quality and watershed monitoring will be implemented as prescribed in the water resources management section to enable early detection of potential adverse effects to rare mussel species</li> </ul>	FY 01-05



<p>that have been recorded to occur in Sideling Hill Creek on TBBTF.</p>	
<ul style="list-style-type: none"> <li>■ Conduct a screening level survey for potential rare mussel species occurring in Sideling Hill Creek on TBBTF. The screening level survey will be conducted during low flow conditions and will consist of the identification of mussel/clam shells occurring on the banks and bars along the creek. Disturbance of live mussels occurring in the creek will be avoided. The purpose of the survey is to supplement past studies conducted on Sideling Hill Creek on TBBTF.</li> </ul>	<p>FY 02 (Summer/ Fall)</p>
<ul style="list-style-type: none"> <li>■ Dimilin® or Bt (<i>Bacillus thuringiensis</i>) will not be sprayed for gypsy moth control in the vicinity of shale barrens on TBBTF because of the recorded presence of the Olympia marble (<i>Euchloe olympia</i>) on the Boy Scout Barren and the potential for the presence of other rare Lepidoptera (butterflies and moths) on shale barrens on the facility.</li> </ul>	<p>FY 01-05</p>
<p><b>State Listed Flora</b></p>	
<ul style="list-style-type: none"> <li>■ Known habitats and locations of state listed plant species on TBBTF will be protected from adverse impacts associated with training, general use, and the implementation of natural resources management activities.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Access and use restrictions in the RUA and 100 meter buffer to Sideling Hill Creek will continue to be implemented.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Known populations of state listed plant species will be monitored to detect long term changes in the status of populations on TBBTF.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ <b>Broad-glummed broam (<i>Bromus laligluntis</i>).</b> Inventory the area in, and adjacent to, the power line/fire break on the Lower Sideling Hill Creek Floodplain and East Slopes for the presence of broad-glummed brome to ensure that efforts to remove multiflora rose from the area will not adversely effect the state endangered plant. If the plant does occur in the area, modify methods to remove multiflora rose, as necessary, to avoid adverse impacts to the plant (see measures for pest management).</li> </ul>	<p>FY01</p>
<ul style="list-style-type: none"> <li>■ <b>Stellate sedge (<i>Carex radiata</i>).</b> Inventory the area in, and adjacent to, the power line/fire break on the Lower Sideling Hill Creek Floodplain and East Slopes for the presence of stellate sedge to ensure that efforts to remove multiflora rose from the area will not adversely affect the state endangered plant. If the</li> </ul>	<p>FY01</p>

<p>plant does occur in the area, modify methods to remove multiflora rose, as necessary, to avoid adverse impacts to the plant (see measures for pest management).</p>	
<p>■ <b>Wood' sedge</b> (<i>Carex tetanica</i> var. <i>woodii</i>). Monitor streambanks along the Lower Sideling Hill Creek Floodplain and East Slopes and the South Central Ridge and Floodplain for active erosion. If active streambank erosion is determined to be occurring, survey the banks where the erosion is occurring for the presence of Wood's sedge. Evaluate the feasibility of implementing management measures to stabilize streambank erosion if it is determined to be threatening populations of Wood's sedge. Monitoring should be conducted on an annual basis and following major storm or flood events.</p>	FY 01-05
<p>■ <b>Standley's Goosefoot</b> (<i>Chenopodium standleyana</i>). Restrict training activities on the Strauss Barren to the approved rappelling and mountaineering site.</p>	FY 01-05
<p>■ <b>Small-headed sunflower</b> (<i>Helianthus microcephalus</i>). Inventory the area in, and adjacent to, the power line/fire break on the Lower Sideling Hill Creek Floodplain and East Slopes for the presence of small-headed sunflower to ensure that efforts to remove multiflora rose from the area will not adversely effect the state endangered plant. If the plant does occur in the area, modify methods to remove multiflora rose, as necessary, to avoid adverse impacts to the plant (see measures for pest management).</p>	FY01
<p>■ <b>Crested iris</b> (<i>Iris cristata</i>). Monitor streambanks along the Lower Sideling Hill Creek Floodplain and East Slopes and the South Central Ridge and Floodplain for active erosion. If active streambank erosion is determined to be occurring, survey the banks where the erosion is occurring for the presence of crested iris. Evaluate the feasibility of implementing management measures to stabilize streambank erosion if it is determined to be threatening populations of crested iris. Monitoring should be conducted on an annual basis and following major storm or flood events.</p>	FY 01-05
<p><b>State Rare and Watchlist Flora</b></p>	
<p>■ Known habitats and locations of state rare and watchlist plant species on TBBTF will be protected from adverse impacts associated with training, general use, and the implementation of natural resources management activities.</p>	FY 01-05

<ul style="list-style-type: none"> <li>■ Access and use restrictions in the RUA and 100-meter buffer to Sideling Hill Creek will continue to be implemented.</li> </ul>	FY01-05
<b>Resource Area: Cultural Resources Management</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Trainers or other users of TBBTF will be advised of the potential for the occurrence of cultural resources on the facility prior to training activities. Trainers will be briefed on the proper operating procedures to be followed if cultural resources are discovered.</li> <li>■ Soldiers or other personnel using TBBTF will not remove or disturb, or cause or permit to be removed or disturbed, any historical, archaeological, architectural or other cultural artifacts, relics, vestiges, remains or objects of antiquity. If such items are discovered on TBBTF they will be protected from further disturbance and reported to the Site Manager. The Site Manager will take steps to ensure that the items are not disturbed while further guidance on the potential historical relevance and proper care of the item(s) is obtained.</li> <li>■ Training activities will be directed to avoid the cemetery located in the southeast section of TBBTF. Land navigation points will be located away from the cemetery to avoid potential disturbance of the area.</li> </ul>	<p>FY 01-05</p> <p>FY 01-05</p> <p>FY 01-05</p>
<b>Resource Area: Forest Management</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Conduct routine monitoring for signs of insect infestations and disease. The woolly hemlock adelgid (<i>Adelges tsugae</i>) has become locally abundant in Maryland. If infested trees are discovered mechanical removal will be considered. The potential effectiveness and possible adverse effects of harvest, based on the nature of the problem will be considered prior to harvest. The gypsy moth (<i>Lymantria dispar</i>) also has the potential to infest forested areas in the vicinity of TBBTF. If indications of infestations of gypsy moths are observed on TBBTF, treatment of the problem will be coordinated with the Cooperative Gypsy Moth Suppression Program. Due to the potential for rare Lepidoptera (moths and butterflies) inhabiting TTBTF, spraying with Dimilin or Bt (<i>Bacillus thuringiensis</i>) should not be used as a method of controlling the moth.</li> </ul>	FY 01-05

<ul style="list-style-type: none"> <li>■ Control invasive species as prescribed in the measures for pest management.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of forest management practices that require terrain alteration. Forest management activities, such as harvesting of insect infested trees, that result in terrain modification must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with forest management activities may be generated under the National Historic Preservation Act (NHPA), NEP A, the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA) and EO 13007 (also see Section 5.10).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Continue to conduct training for fire prevention and reporting for users of TBBTF prior to the use (also see fire management measures).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Post the fire danger rating at established locations on TBBTF.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Personnel making use of the land on TBBTF will monitor and be aware of fire hazards and adjust their programs, including the suspension of activities, to avoid high hazard areas and/or periods (also see fire management measures).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Snags will be left standing unless they are determined to be a safety hazard.</li> </ul>	FY 01-05

**Resource Area: Pest Management**

<b>Management Measure/Project</b>	<b>Time Frame</b>
<p><b>Pest Management</b></p> <ul style="list-style-type: none"> <li>■ IPM will be fully implemented at TBBTF when the IPMP for the state and TBBTF is completed. The IPMP is scheduled to be completed in 2001.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Mechanical and cultural strategies as an alternative to the use of chemical pesticides or herbicides will be implemented whenever possible.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Domestic insect and other pest control measures will be applied in closed in structures as necessary. Avoid the need for chemical control methods as much as possible by maintaining the interiors</li> </ul>	FY 01-05

<p>and exteriors of structures so that they are not attractive to pests. Examples of practices that can be implemented to reduce the need for chemical controls in closed in structures include fixing cracks in foundations; keeping food in closed containers; emptying trash cans after building use; and keeping windows, screens and shutters closed and locked when buildings are not in use.</p>	
<ul style="list-style-type: none"> <li>■ Current forest pest management practices include harvest. In the event of a problem serious enough to warrant treatment, TBBTF will consider harvest of the infected trees first. The potential effectiveness and possible adverse effects of harvest, based on the nature of the problem, will be considered prior to harvest. Chemical treatments, such as the use of insecticides, will only be used as a last resort following approval by the appropriate agencies (ie. DNR). Chemical treatments should not be used on, or adjacent to, shale barrens. If it is determined that chemical treatment is the only viable method for controlling a pest that is adversely affecting a sensitive habitat, then its use will be considered. Any use of a chemical treatment will be closely coordinated and managed to ensure that non-target species, water quality or other natural resources are not adversely affected.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Harvest infected trees as soon as possible, after determining that harvest is a viable and effective approach, in order to prevent the spread of insect infestation or disease to other trees.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ The requirement for National Historic Preservation Act Section 106 consultation will be determined prior to the implementation of pest management practices that require terrain alteration. Pest management activities, such as harvesting of infested trees, that result in terrain modification must consider the potential for adverse impacts to cultural resources. Cultural resources compliance requirements associated with pest management activities may be generated under the National Historic Preservation Act (NHPA), NEP A, the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA) and EO 13007 (also see Section 5.10).</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Chemical treatment for gypsy moths, using Dimilin® or Bt (<i>Bacillus thuringiensis</i>) will not be used in the vicinity of shale barrens due to the high probability for the presence of rare Lepidoptera (butterflies and moths) in the habitats. These pesticides are very effective for controlling moths and butterflies and have the potential to destroy entire populations of Lepidoptera in sprayed, or downdrift areas.</li> </ul>	<p>FY 01-05</p>

<ul style="list-style-type: none"> <li>■ Consult the Maryland Department of Agriculture regularly concerning insect and disease problems in the surrounding forest environment to allow early identification of potential problems on TBBTF and the consideration of potential viable solutions.</li> </ul>	FY 01-05
<p><b>Exotic Invasive Plant Species Management</b></p>	
<ul style="list-style-type: none"> <li>■ The most prevalent exotic invasive plant occurring on TBBTF is microstegium. The grass occurs in dense monotypic populations at several locations along Sideling Hill Creek and its floodplains. Microstegium also occurs along, and in the woods adjacent to, the unnamed tributary that flows from the water supply pond to Sideling Hill Creek. The current extent of microstegium on TBBTF has not been determined or recorded. Assess the extent of the grass on TBBTF so that management objectives and an evaluation of the feasibility of management can be determined. Use the assessment to identify targets for initial management efforts for the control of microstegium on the facility.</li> </ul>	FY 01 (Summer)
<ul style="list-style-type: none"> <li>■ Garlic mustard occurs in small patchy to large dense populations across TBBTF. Management of garlic mustard on TBBTF will be based on recording the locations of populations as they are identified and targeting them for removal based on their extent and the availability of personpower for their removal. Implement hand pulling or mechanical methods for the removal of garlic mustard. Bag and remove plants that are pulled after they have flowered. Conduct monitoring of areas where garlic mustard has been removed on a yearly basis in the spring before seeds have developed so that follow up management can be directed as needed.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Base prioritization of invasive species management on TBBTF on the current extent of the species on TBBTF; the current and potential impact of the species; the difficulty of control; and the value of the habitats/areas that the species infest or may infest. In most cases, the highest priority for management will be based on preventing new problems from developing or spreading by immediately addressing incipient populations of exotic invasive plants. Base priority for the management of established populations on their rate of growth, the current and potential impact of the species on existing natural ecosystems and their potential adverse effect on sensitive habitats or species.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Brief MDARNG trainers interested in invasive species management on TBBTF on the identification and proper</li> </ul>	FY 01-05

<p>approaches for management of the species on the facility. This will enable trainers to assist in the management of exotic invasive plant species on the facility. This will also enable trainers to train and utilize troops, when consistent with training and mission objectives, to assist in the management of invasive plants on TBBTF.</p>	
<ul style="list-style-type: none"> <li>■ When possible and consistent with training and mission objectives, troops will be briefed on the identification of common invasive plant species that occur on TBBTF and will assist in locating their occurrence on the facility. When possible, troops will identify the locations of invasive plant species that are observed during training operations. The approximate locations of observed invasive plant species along with the approximate extent of the occurrences will be recorded and reported to the Site Manager. A database of the location and approximate extent of reported invasive species occurrences will be developed. Field verification of the reported occurrences will be conducted and the feasibility of treatment will be assessed. Data collected during training operations will be used to help develop plans for invasive species management on TBBTF.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Where possible, prioritize newly established populations of invasive plant species for removal. Established populations should be monitored and potential for their control assessed. At a minimum, habitats should be managed to prevent direct displacement of endangered species by invasive, non-native species.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ In all cases, implement mechanical control methods for invasive species management on TBBTF where it is determined to be feasible.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Implement a long-term inspection program to monitor the success and efficiency of invasive species management and control on TBBTF. Use personnel knowledgeable in the control and management of exotic invasive plant species to provide supervision and management oversight of exotic invasive plant management on TBBTF. Monitoring will be used to measure the success of treatment efforts, determine the need for additional (follow up) treatment, identify areas where modified approaches to treatment may be necessary (adaptive management), and to track and document the recovery of native plants in treated areas. Monitoring will also be conducted following invasive plant removal to ensure that disturbance associated with removal does not result in the reestablishment of the invasive or the establishment of different invasive plants.</li> </ul>	FY 01-05

<ul style="list-style-type: none"> <li>■ Landscaping around buildings and grounds should not include the use of landscape materials that could spread to nearby natural areas or contaminate local genetic stocks. Use regionally native plant species for landscaping where feasible. Where use of native species is not feasible, non-invasive plant species should be used for landscaping.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Limit use of herbicides for exotic invasive plant species control in areas adjacent to water bodies on TBBTF. Where it is determined that use of herbicide is the only viable approach for control of invasive plants, application should be made by personnel trained in their proper use. Minimum offsets of 30 feet should be maintained from water bodies for use of herbicides and application should be directed specifically at target species. Herbicides used in areas adjacent to water bodies should be limited to those that do not migrate in the soil and that do not persist for an extended time after application (i.e. glyphosate).</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>■ Efforts to remove microstegium from the North Central Floodplain were initiated in the late summer/fall (August/September) of 2000. Efforts to remove garlic mustard from the North Central Floodplain were initiated in the late spring of 2000. An area of microstegium occurs in the upstream section of the North Central Floodplain approximately 1000 feet downstream from the boundary of TBBTF. The main area of microstegium is roughly estimated to be about 15,000 square feet. The upper floodplain upstream of the affected area is wooded and there are no signs of microstegium except in small patchy areas adjacent to the main occurrence. Microstegium does occur on two small areas on the lower floodplain above the affected area. Early season observations of several hundred feet of the floodplain upstream of the TBBTF boundary also showed no indications of the presence of microstegium. Microstegium also was not observed in the floodplain downstream from the affected area to the Boy Scout Barren, except as patchy occurrences. The diversity of the vegetation occurring in the floodplain below the affected area would indicate that up to the current time, the extent of microstegium in this stretch of the floodplain has probably been minimal or non-existent. The limited current extent of microstegium in this section of the Sideling Hill Creek floodplain along with the presence of buffers both upstream and downstream of the observed occurrence indicates that this apparently incipient population of the grass could be controlled and eventually eradicated if it is addressed in a timely manner. Removal, of microstegium from this section of the floodplain would also</li> </ul>	FY01 (evaluate the success of the 2000 removal efforts and develop additional removal Strategy-Spring/Summer)  FY 01-05 (monitor on an annual basis and continue removal as necessary)



increase the extent of the floodplain where the grass has not become established along with the buffer between active seed sources and existing downstream populations making the potential for the future control of downstream populations more viable.

Effective treatment of the microstegium on the North Central Floodplain will probably require a combination of hand pulling around the perimeter of the invasive population along with mechanical removal (weed eaters) and possible limited and directed use of herbicide (2% concentration of glyphosate) in areas where monocultures of the grass are established. Observations of the proposed project site will be made prior to the planned dates for removal of the microstegium to determine the most viable treatment method and whether the use of herbicide will be necessary. The use of herbicide will be avoided if it is determined that the grass can be controlled mechanically. A population of garlic mustard also occurs within and adjacent to the microstegium occurrence. Mechanical removal of the garlic mustard should be implemented to help insure that the removal of microstegium in the area does not result in the establishment of a monoculture of garlic mustard. Additional observations will be made during pre-removal site assessment for the occurrence of other exotic invasive plant species in the vicinity of the microstegium. If additional invasive plant species are identified in the area, the management approach will be adapted to address their control.

Efforts to remove microstegium from the North Central Floodplain will include assistance from youth volunteers from the Challenge Program, the Maryland Native Plant Society and MDARNG. The Maryland Native Plant Society will provide botanical expertise and oversight to assist in the identification of plants and to ensure that potential impacts to native or sensitive plant species on the floodplain are minimized. The area treated during the initial effort (late summer/fall of 2000) was delineated and recorded for future monitoring purposes. Monitoring of the project area will be conducted during the spring/summer of 2001 to assess the success of the initial effort and determine the need for action in the late summer/fall of 2001. Future treatment and monitoring recommendations for the North Central Floodplain project area will be developed and based on an adaptive management approach and will be modified as necessary based on observed successes and failures.

- Inventory the stream crossing for light infantry training on Sideling Hill Creek to determine the current extent of

<p>microstegium in the area. Data gathered in the 1996 inventory conducted by the USGS should be used, where possible, to determine recent historic presence of microstegium at the stream crossing. This data can be compared with the current inventory to determine recent spread of microstegium. Mechanically remove microstegium from the stream crossing area and in an area 150 feet upstream and downstream of the crossing on both banks of Sideling Hill Creek. The microstegium will be mechanically removed after it has flowered, but before its seeds become viable (August to October) to ensure that new seed stock associated with plant removal is not supplied to the soil. Removal of the microstegium will be conducted under the supervision of a botanist to ensure that sensitive or protected plant species that may be present within or adjacent to the microstegium populations are not adversely impacted (see management measure for riparian areas).</p>	<p>FY01 (determine the current extent of the grass and develop removal Strategy-Spring/Summer)</p> <p>FY 01-05 (monitor on an annual basis and continue removal as necessary)</p>
<ul style="list-style-type: none"> <li>▪ Use a bush hog or weed eaters to manage microstegium occurring on the roadway approach to Sideling Hill Creek on both sides of the stream crossing for light infantry training. Mow after the microstegium has flowered, but before its seeds become viable. Mowing will be required on a yearly basis for up to seven years due to the long seedbank viability of microstegium. Remove pioneer plants in the adjacent woods and those occurring in the creek bed by hand. Conduct yearly monitoring of microstegium in and adjacent to the roadway to determine if mowing effectively contains the spread, or over time reduces the extent, of the species. If it is determined that mowing does not effectively control microstegium in the roadway at the crossing, management will be adapted and other methods for controlling the species will be evaluated and implemented for control. Continued yearly monitoring will be used to evaluate the success of the control efforts and determine if further modifications are necessary (see management measure for riparian areas).</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>▪ Monitor the approach to the stream crossing on both sides of Sideling Hill Creek to determine if using the crossing is resulting in the spread of microstegium along and adjacent to the training trails. Address any spread of microstegium associated with the stream crossing in a timely manner to ensure that spread of the species is minimized. Mechanical removal of the grass should be conducted after the plant has set flower but before the seeds become viable. Monitoring of the stream crossing and adjacent area should be conducted several times throughout the growing season so that any new spread of the species associated with the</li> </ul>	<p>FY 01-05</p>

<p>use of the stream crossing will be detected. Continue to mechanically remove microstegium from the stream crossing area and in the area 150 feet along and inland from the streambank upstream and downstream of the crossing along with any new spread of the grass associated with use of the crossing on an annual basis. Continue to monitor the stream crossing and adjacent areas for the spread of microstegium several times throughout the growing season on an annual basis (see management measures for riparian areas).</p>	
<ul style="list-style-type: none"> <li>■ Hand pull garlic mustard occurring at the Sideling Hill Creek crossing for light infantry and in the area 150 feet along and inland from the streambank upstream and downstream from the crossing. Monitor the area on an annual basis for the reoccurrence of garlic mustard and to determine if use of the crossing is resulting in the spread of garlic mustard. Hand pull garlic mustard occurring in the area on an annual basis. Removal of garlic mustard from the crossing area should be conducted in May-June. Plants that are pulled after flowering has occurred should be bagged and removed from the site (see management measure for riparian areas).</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Mechanically remove yellow day lily from the floodplain areas 150 feet upstream and downstream of the Sideling Hill Creek crossing for light infantry. Pitchforks or other similar tools should be used for removal to ensure the bulbs of the day lily are also removed. Plants should be bagged and removed from the site following their removal. Monitor the area on an annual basis for the occurrence of yellow day lily and remove plants that reoccur (see management measure for riparian areas).</li> </ul>	<p>FY 01-05 (late Spring)</p>
<ul style="list-style-type: none"> <li>■ Remove bush honeysuckle on the west side of Sideling Hill Creek along the road approaching the crossing for light infantry. A well-established population of bush honeysuckle occurs in an approximately 1+ acre area along the road. Assess the extent of the bush honeysuckle population and direct initial efforts for removal of plants occurring in the woods around the parameter of the main population. Mechanical methods should be implemented for removal of bush honeysuckle from the area. Monitor on an annual basis to determine the success of management and remove any plants that become reestablished in the area. Monitoring should be conducted in early spring because early leaf out of the plant makes its identification easier at this time of year (see management measure for riparian areas).</li> </ul>	<p>FY 01-05 (early Spring)</p>
<ul style="list-style-type: none"> <li>■ Remove bush honeysuckle from the North Central Floodplain. Bush honeysuckle occurs sparsely as individual plants on the</li> </ul>	<p>FY01</p>

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<p>floodplain based on observations made during a preliminary site assessment conducted in the spring of 2000. The population is incipient and could be controlled with limited effort, if addressed in a timely manner. Remove shrubs mechanically or by hand pulling.</p>	
<ul style="list-style-type: none"> <li>▪ Hand pull or mechanically remove spotted knapweed from the Boy Scout Barren along Allegany County Line Road. Conduct removal of spotted knapweed along the road on the barren on an annual basis.</li> </ul>	FY 01-05
<ul style="list-style-type: none"> <li>▪ Mechanically remove Japanese barberry and multiflora rose from the wooded area between the water supply pond and the access road.</li> </ul>	FY 01-02
<ul style="list-style-type: none"> <li>▪ Mechanically remove Japanese barberry from the wooded area adjacent to Ziegler Road to the west of the main entrance.</li> </ul>	FY 01-02
<ul style="list-style-type: none"> <li>▪ Reassess (year 2001) the extent of, and mechanically remove garlic mustard from the wooded area adjacent to Ziegler Road along the unnamed tributary to Sideling Hill Creek in the vicinity of the main entrance to TBBTF.</li> </ul>	FY01 (early Summer)
<ul style="list-style-type: none"> <li>▪ Remove multiflora rose in the Lower Sideling Hill Creek Floodplain along the power line/fire break to Tabler Lodge. Heavy equipment (backhoe) is recommended to knock down the large rose clumps. The multiflora rose should be removed from the site after it is pulled so that new seed stock is not supplied to the area from the pulled shrubs. Follow up monitoring and treatment of the area will be necessary due to resprouting and because seeds will be spread and germinate readily on the disturbed soil. Equipment used to knock down and remove multiflora rose from the power line/fire break will operate from the existing access road and the fire break in order to avoid potential impacts to wetlands that occur in the wooded area just to the east of the project site.</li> </ul>	FY01 (initial removal with heavy equipment)  FY 02-05 (monitor and additional removal)
<ul style="list-style-type: none"> <li>▪ Hand pull or mechanically remove young multiflora rose bushes from the Lower Sideling Hill Creek Floodplain in the meadow to the east and wooded area to the west of the power line/fire break to Tabler Lodge. A large number of young shrubs have established in the area and will develop into dense impassible growths if they are not removed in the near future.</li> </ul>	FY01
<ul style="list-style-type: none"> <li>▪ Mechanically remove microstegium from the access road adjacent to the entrance to Straus Lodge. Monitor the area on an annual</li> </ul>	FY 01-05

<p>basis to ensure that removal of the grass was successful and to direct additional management efforts, if necessary.</p> <ul style="list-style-type: none"> <li>■ Assess the extent and potential for the removal of microstegium from areas where it occurs on the Big Pool Face and Vicinity and the area just upstream of the Big Pool on the left bank of Sideling Hill Creek. Initial efforts to manage microstegium in the area should concentrate on removing the grass from areas where it is spreading upslope into adjacent woods.</li> <li>■ Assess the extent of microstegium occurring along and in the woods adjacent to the unnamed tributary between the water supply pond and Sideling Hill Creek. This area includes sections of the North Ridge sensitive area. Evaluate the potential for control of the spread of microstegium in the area. If it is determined to be feasible, develop a plan for control and removal of the grass from along the tributary.</li> <li>■ Assess the extent and potential for the removal of bush honeysuckle, multiflora rose and Japanese honeysuckle from along and adjacent to Allegany County Line Road to the north of the Boy Scout Barren near the northern boundary of TBBTF. The extent of the exotic invasives should be assessed to determine their potential for future management and control in the area.</li> <li>■ Assess the extent and potential for removal of barren brome from along and adjacent to Allegany County Line Road to the north of the Boy Scout Barren near the northern boundary of TBBTF. The extent of the exotic grass should be assessed to determine its potential for future management and control in the area.</li> </ul>	<p>FY01-05</p> <p>FY01 (Summer)</p> <p>FY01</p> <p>FY01</p>
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<b>Resource Area: Fire Management</b>	
<b>Management Measure/Project</b>	<b>Time Frame</b>
<ul style="list-style-type: none"> <li>■ Personnel making use of the land on TBBTF will monitor and be aware of fire hazards and adjust their programs, including the suspension of activities, to avoid high hazard areas and/or periods.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Minimize the potential for the occurrence of brush and forest fires on TBBTF by restricting activities, spatially or seasonally, that present potential for fire hazards.</li> </ul>	<p>FY 01-05</p>
<ul style="list-style-type: none"> <li>■ Conduct annual monitoring and track plant species succession on the Carex Fire Slope. Use the results of monitoring to determine the viability of using prescribed</li> </ul>	<p>FY01 (initial characterization of vegetative</p>

<p>burning in the future to maintain healthy terrestrial ecosystems on TBBTF and reduce the potential for wildfires. Compare current vegetation on the Carex Fire Slope with similar adjacent unbumed habitats to establish a general characterization of plant reestablishment and succession from the occurrence of the fire (1993) until present.</p> <ul style="list-style-type: none"> <li>■ Conduct annual monitoring and track plant species succession on the Upper Straus Barren bum area (burned in the early 1990's). Use the data from monitoring to determine the viability of using prescribed bums in the future to maintain healthy shale barren ecosystems on barrens with similar characteristics to the Straus Barren. Compare current vegetation on the bum site to vegetation on similar unbumed areas of the Straus Barren to establish a general characterization of plant succession from the time of the fire till present.</li> </ul>	<p>communities- S unimer)</p> <p>FY 01-05 (monitoring and assessment)</p> <p>FY01 (initial characterization of vegetative communities- Summer)</p> <p>FY 01-05 (monitoring and assessment)</p>
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**APPENDIX H**  
**Acronyms**

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## ACRONYMS

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QCRs	Air Quality Control Regions
AR	Army Regulation
ARNG	Army National Guard
BMP	Best Management Practice
BOCA	Building Officials and Code Administrators, Inc.
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
DNR	Maryland Department of Natural Resources
DPOT	Department of Plans, Operations, and Training
EA	Environmental Assessment and Environmental Awareness
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fahrenheit
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act of 1981
GIS	geographic information system
GUA	General Use Area
HQ-STARC-DPOT	Headquarters Facilities Sites Manager
HWCMECD	Hagerstown - Washington County Maryland Economic Development Commission
INRMP	Integrated Natural Resources Management Plan
ITAM	Integrated Training Area Management
LASWA	Lil Aaron Straus Wilderness Area
LCTA	Land Conditions Trends Analysis
LRAM	Land Rehabilitation and Management
MDARNG	Maryland Army National Guard
MDDNR WHD	Maryland Department of Natural Resources Wildlife Heritage Division
MD-STARC-DPOT	State Facilities Sites Manager
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO <sub>2</sub>	nitrogen dioxide
NPS	nonpoint source
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
O <sub>3</sub>	ground level ozone
OAQPS	Office of Air Quality Planning and Standards
OIC	Officer in Command
Pb	lead
RUA	Restricted Use Area
PM <sub>10</sub>	particulate matter
SERE	Survival, Evasion, Resistance, and Escape
SHPO	State Historic Preservation Officer
SHWMA	Sideling Hill Wildlife Management Area
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SOP	standard operating procedures
STARC	State Area Command
TAG	The Adjutant General
TBBTF	Brigadier General Thomas B. Baker Training Facility
T&E	threatened and endangered

## ACRONYMS

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TNC	The Nature Conservancy
Tss	total suspended solids
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOC	United States Department of Commerce
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

## **Finding of No Significant Impact**

### **For Implementing an Integrated Natural Resources Management Plan For The Brigadier General Thomas B. Baker Training Facility (TBBTF)**

In accordance with the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500-1508) for implementing the procedural provisions of the National Environmental Policy Act (42 U.S.C. 4321 et seq.) and Army Regulation 200-2 (Environmental Effects of Army Actions), the Maryland Army National Guard (MDARNG) has conducted an Environmental Assessment (EA) of the potential effects associated with implementing an Integrated Natural Resources Management Plan (INRMP) at TBBTF. This INRMP has been prepared in accordance with the provisions of the Sikes Act (16 U.S.C 670a et seq.) and Army Regulation 200-3 (Natural Resources-Land, Forest and Wildlife Management).

#### **A. Description of Proposed Action and Alternatives**

**Proposed Action.** The MDARNG proposes to implement an INRMP, which supports the management of natural resources at TBBTF. The purpose of the proposed action is to carry out the set of resource-specific management measures developed in the INRMP. This enables TBBTF to effectively manage the use and condition of natural resources located on the installation and protects the natural setting primarily for training purposes. Implementation of the proposed action will support the MDARNG's ongoing need to train soldiers in a realistic natural setting while meeting other mission and community support requirements, practicing sound resource stewardship and complying with environmental policies and regulations.

The proposed action supports an ecosystem approach to natural resources management and includes specific resource management measures to be undertaken on TBBTF. The proposed action focuses on a 5-year planning period, which is consistent with the time frame for the management measures described in the INRMP. This planning period will begin in the 2001 upon approval of the document. The plan supports an adaptive approach to natural resources management and may require additional environmental analyses if management approaches are modified, or as new management measures are developed over the long-term (i.e., beyond 5 years).

**Alternatives.** The development of proposed management measures for the INRMP included a screening analysis of resource-specific alternatives. The screening analysis involved the use of accepted criteria, standards, and guidelines, when available, and best professional judgement, to identify practices for achieving TBBTF's natural resource management objectives. The outcome of the screening analysis led to the development of the proposed action as described above. Consistent with the intent of NEPA, the screening process focused on identifying a range of reasonable resource-specific management alternatives and, from that, developing a plan that could be implemented, as a whole, in the foreseeable future. Management alternatives deemed to be infeasible were not analyzed further. As a result of the screening process, the EA, made an integral part of the INRMP, formally addresses two alternatives, the proposed action (i.e., implementation of the INRMP) and the No Action alternative.

Implementation of the No Action alternative means that the proposed management measures set forth in the INRMP will not be implemented. Current management measures for natural resources will remain in effect, and existing conditions will continue. This document refers to the continuation of existing (i.e., baseline) conditions of the affected environment, without implementation of the proposed action, as the No Action alternative. Inclusion of a No Action alternative is prescribed by CEQ regulations and serves as a benchmark against which the proposed action can be evaluated.

## **B. Environmental Analysis**

The EA, which is incorporated by reference into this Finding of No Significant Impact (FNSI), examines potential effects of the proposed action and the No Action alternative on resources and areas of environmental concern that could be affected by implementing the INRMP. These include climate; air quality; noise; topography; geology; soils; water resources; wetlands; aquatic habitat; riparian habitat; terrestrial ecosystems; sensitive or significant habitats; fauna; endangered, threatened, and rare species; cultural resources; land use; facilities; hazardous and toxic materials; socioeconomic resources; and environmental justice. Implementation of the proposed action would result in no effects, and short- and long-term beneficial effects on identified resources and areas of environmental concern.

Based on the results of the EA, it is determined that implementation of the proposed action will have no significant direct, indirect or cumulative impacts on the quality of the natural or human environment. Implementation of the INRMP is expected to improve existing conditions at TBBTF, as shown by the potential for beneficial effects. The proposed action will enable TBBTF over time to achieve its goal of maintaining ecosystem viability and ensure sustainability of desired military training area conditions. Based on the EA there will be no significant environmental impacts resulting from implementation of the proposed action, so an Environmental Impact Statement is not required and will not be prepared.

## **C. Regulations**

There are no indications that implementation of this action will violate any federal, state, or local environmental laws or regulations. The proposed action would not violate the National Environmental Policy Act (42 USC § 4321 to 4370e), its regulations as promulgated by the Council on Environmental Quality (40 CFR Parts 1500-1508), Army Regulation 200-2 "Environmental Effects of Army Actions" or any other federal, state, or local environmental laws or regulations. The EA documents the status of project compliance with applicable federal environmental statutes and executive orders.

## **D. Public Review and Comment**

Notice of Availability of the Draft INRMP and EA for a public review and comment period of 30 days was published in the Hancock News (Hancock, MD), Frederick Post (Frederick, MD), Herald-Mail (Hagerstown, MD), and the Cumberland Times (Cumberland, MD). Copies of the newspaper ads announcing the notice of availability are presented in Appendix E of the INRMP and EA. The draft INRMP and EA was made available for public review at the Hancock Library, The Washington County Free Library, and the Allegany County Library. Any

comments received on the draft document were considered for inclusion in the Final INRMP and EA. Agency responses to review of the Draft INRMP and EA are presented in Appendix F of the INRMP and EA.

The final INRMP and EA will be made available for public review at the following locations:

Hancock Library  
290 Park Road  
Hancock, Maryland

The Washington County Free Library  
100 South Potomac Street  
Hagerstown, Maryland


Allegany County Library  
31 Washington Street  
Cumberland, Maryland

Interested parties are invited to review the final INRMP and EA and submit written comments before close of the public review period. Written comments should be sent to Mr. Shannon Cauley, The Louis Berger Group, Inc., 1819 H Street NW, Suite 900, Washington, DC 20006. Comments can be faxed to 202-293-0787. Questions or requests for more information should be directed to Mr. Shannon Cauley at 202-331-7775 (Ext. 474).

#### **F. FINDING OF NO SIGNIFICANT IMPACT**

A careful review of the Environmental Assessment has concluded that the implementation of INRMP for TBBTF will not have any significant adverse impacts on the quality of the existing natural or human environment. The requirements of the National Environmental Policy Act and the Council on Environmental Quality regulations have been satisfied and an Environmental Impact Statement will not be prepared.

August 23, 2001  
Date "

  
RICHARD O. MURPHY  
Colonel, Chief of Environmental Programs  
National Guard Bureau