



United States  
Department of  
Agriculture

Forest  
Service

National Forests in North Carolina  
Pisgah National Forest  
Appalachian Ranger District  
Hot Springs Station

PO Box 128  
Bridge St  
Hot Springs, NC 28743-0128  
828-622-3202

---

File Code: 1950-1

Date: July 18, 2006

Dear Interested Members of the Public and Forest Users:

Enclosed is a copy of the Environmental Assessment (EA) for the Hickey Fork Road project located in Madison County on the Appalachian Ranger District. The proposed action is to repair and restore the Hickey Fork Road in areas that were damaged by floods in July and August of 2001. Proposed activities include road restoration and protection of road embankments along the Hickey Fork Road, including approximately 1050 feet of road relocation, stream bank stabilization along East Prong Hickey Fork Creek, installation of rock vanes for protection of the restored road bed, and culvert replacement and repair. Three alternatives were fully evaluated and analyzed in detail in the EA and Alternative C has been identified as the preferred alternative. Although a preferred alternative has been identified the final decision on which alternative to implement has not been made. I am seeking your input on this EA before I reach a decision.

This project was previously scoped and an EA was sent out for comments in March of 2003. Many of the comments received requested more detailed information to properly evaluate and comment on the proposed action. Due to the concern over the lack of detailed information, no decision was made at that time. During the period since that time, a more detailed engineering design has been completed for the proposed action, a permit for the proposed action has been obtained from the United States Corps of Engineers, and the EA has been revised to reflect new analysis and data.

In accordance with 36 CFR 215.6(a)(3), individuals or organizations wishing to be eligible to appeal must provide the following information: 1) Your name and address; 2) Title of the Proposed Action; 3) Specific comments (215.2) on the proposed action, along with supporting reasons that the Responsible Official should consider in reaching a decision; and 4) Your signature or other means of identification verification. For organizations, a signature or other means of identification verification must be provided for the individual authorized to represent your organization.

In accordance with 36 CFR 215.6(2)(4), comments must be postmarked or received within 30 days beginning the day after publication of a legal ad in the *Asheville Citizen Times*. Written comments should be sent to, District Ranger, P.O. Box 128, Burnsville, NC 28714, or faxed to (828) 682-9179. Oral or hand-delivered comments must be received within our normal business hours of 8:00 a.m. to 4:30 p.m. Monday through Friday at our office on Bridge Street, Hot Springs, North Carolina. Comments may be mailed electronically in a common digital format to: [comments-southern-north-carolina-pisgah-appalachian@fs.fed.us](mailto:comments-southern-north-carolina-pisgah-appalachian@fs.fed.us). Additional information and copies of the Environmental Assessment may be obtained by contacting me at (828) 682-6146 or Karen Compton at (828) 257-4230.

Sincerely,

/s/ Paul L. Bradley  
PAUL L. BRADLEY  
District Ranger

Enclosure





United States  
Department of  
Agriculture

Southern Region  
Forest Service

July 2006



# Environmental Assessment

## **Hickey Fork Storm Damage Restoration Project**

**Appalachian Ranger District, Pisgah National Forest  
Madison County, North Carolina**

# Hickey Fork Storm Damage Restoration Project

## Environmental Assessment

Location of Action:        Compartments 407, 408, 409, 410, 412 and 413  
                                  Appalachian Ranger District  
                                  Pisgah National Forest  
                                  Madison County, North Carolina

Lead Agency:                USDA Forest Service

Responsible Official:     Paul L. Bradley  
                                  District Ranger  
                                  P.O. Box 128  
                                  Burnsville, NC 28714  
                                  (828) 682-6146

For More Information:     Karen Compton  
                                  Project Coordinator  
                                  (828) 257-4230

Send electronic comments to: [comments-southern-north-carolina-pisgah-appalachian@fs.fed.us](mailto:comments-southern-north-carolina-pisgah-appalachian@fs.fed.us)  
Fax comments to:         (828) 682-9179

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's Target Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14<sup>th</sup> and Independence Avenue SW, Washington DC 20250-9510 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

# TABLE OF CONTENTS

INTRODUCTION.....	1
<b>1 PURPOSE AND NEED FOR ACTION.....</b>	<b>2</b>
1.1 PROPOSED ACTION .....	2
1.2 PURPOSE AND NEED FOR ACTION .....	3
1.3 PROJECT OBJECTIVES.....	3
1.4 DECISION FRAMEWORK .....	4
1.5 PUBLIC INVOLVEMENT.....	4
1.6 KEY ISSUES CONSIDERED AND DISCUSSED THROUGHOUT THIS ANALYSIS .....	5
1.6.1 Issue 1: Impacts to Water Quality .....	5
1.6.2 Issue 2: Recreational Use of the Project Area.....	5
1.6.3 Issue 3: Roaded Access into the Project Area .....	6
1.6.4 Issue 4: Impacts to Wildlife Habitat .....	6
1.6.5 Issue 5: Health and Safety .....	6
1.6.6 Issue 6: Economic Considerations.....	6
1.7 NON-KEY ISSUES CONSIDERED.....	7
1.7.1 Non-Key Issue A: Protection of Botanical Resources .....	7
1.7.2 Non-Key Issue B: Protection of Threatened, Endangered, Sensitive, and Forest Concern Wildlife Species .....	7
1.7.3 Non Key Issue C: Protection of Threatened, Endangered, Sensitive, and Forest Concern Aquatic Species .....	8
1.7.4 Non Key Issue D: Management Indicator Species .....	9
1.7.5 Non Key Issue E: Protection of Heritage Resources.....	9
1.7.6 Non-Key Issue F: Risk of Road Failure in the Future.....	10
1.7.7 Non-Key Issue G: Special Geographic Areas.....	10
1.8 ISSUES BEYOND THE SCOPE OF THIS ANALYSIS .....	11
1.8.1 Enforcement of Closures to ORV's.....	11
1.8.2 Closing the Area to Logging and Re-zoning the Area for Recreation.....	11
1.9 PROJECT RECORD .....	11
<b>2 ALTERNATIVES .....</b>	<b>12</b>
2.1 INTRODUCTION .....	12
2.2 ALTERNATIVES CONSIDERED.....	12
2.2.1 Alternative A: No Action.....	12
2.2.2 Alternative B: Stabilize and Close Hickey Fork Road.....	12
2.2.3 Alternative C: Proposed Action (Repair and Restore Hickey Fork Road).....	13
2.3 DESIGN FEATURES .....	14
2.4 ALTERNATIVES CONSIDERED BUT NOT IN DETAIL .....	16
2.5 SUMMARY COMPARISON OF ACTIONS.....	17
2.6 SUMMARY COMPARISON OF ENVIRONMENTAL EFFECTS.....	18

<b>3</b>	<b>AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS.....</b>	<b>20</b>
3.1	INTRODUCTION .....	20
3.2	IMPACTS TO WATER QUALITY .....	20
3.2.1	<i>Existing Conditions (Water Quality) .....</i>	<i>20</i>
3.2.2	<i>Environmental Effects of Alternative A on Water Quality.....</i>	<i>21</i>
3.2.3	<i>Environmental Effects of Alternative B on Water Quality.....</i>	<i>21</i>
3.2.4	<i>Environmental Effects of Alternative C on Water Quality.....</i>	<i>22</i>
3.3	RECREATIONAL USE OF THE PROJECT AREA .....	23
3.3.1	<i>Existing Conditions (Recreational Use) .....</i>	<i>23</i>
3.3.2	<i>Environmental Effects of Alternative A on Recreational Use.....</i>	<i>24</i>
3.3.3	<i>Environmental Effects of Alternative B on Recreational Use.....</i>	<i>24</i>
3.3.4	<i>Environmental Effects of Alternative C on Recreational Use .....</i>	<i>25</i>
3.4	ROADED ACCESS INTO THE PROJECT AREA .....	25
3.4.1	<i>Existing Conditions (Roaded Access) .....</i>	<i>25</i>
3.4.2	<i>Environmental Effects of Alternative A on Roaded Access .....</i>	<i>26</i>
3.4.3	<i>Environmental Effects of Alternative B on Roaded Access .....</i>	<i>26</i>
3.4.4	<i>Environmental Effects of Alternative C on Roaded Access .....</i>	<i>27</i>
3.5	IMPACTS TO WILDLIFE HABITAT.....	27
3.5.1	<i>Existing Conditions (Wildlife Habitat) .....</i>	<i>27</i>
3.5.2	<i>Environmental Effects of Alternative A on Wildlife Habitat.....</i>	<i>27</i>
3.5.3	<i>Environmental Effects of Alternative B on Wildlife Habitat.....</i>	<i>28</i>
3.5.4	<i>Environmental Effects of Alternative C on Wildlife Habitat .....</i>	<i>28</i>
3.6	HEALTH AND SAFETY .....	29
3.6.1	<i>Existing Conditions (Heath and Safety).....</i>	<i>29</i>
3.6.2	<i>Environmental Effects of Alternative A on Health and Safety.....</i>	<i>29</i>
3.6.3	<i>Environmental Effects of Alternative B on Health and Safety.....</i>	<i>29</i>
3.6.4	<i>Environmental Effects of Alternative C on Health and Safety.....</i>	<i>29</i>
3.7	ECONOMIC CONSIDERATIONS .....	30
3.7.1	<i>Existing Conditions (Economic Considerations).....</i>	<i>30</i>
3.7.2	<i>Economic Considerations of Alternative A.....</i>	<i>30</i>
3.7.3	<i>Economic Considerations of Alternative B.....</i>	<i>30</i>
3.7.4	<i>Economic Considerations of Alternative C.....</i>	<i>30</i>
<b>4</b>	<b>PREPARERS AND PUBLIC INVOLVEMENT .....</b>	<b>31</b>

## APPENDICES

- A. MAPS OF THE PROJECT AREA
  - Management Area Map*
  - Forest and Wildlife Management Map*
- B. BIOLOGICAL EVALUATION
- C. MANAGEMENT INDICATOR SPECIES REPORT

## INTRODUCTION

This environmental assessment (EA) documents the results of site-specific analysis concerning the proposal to repair the damage to Hickey Fork Road in Madison County. The EA discusses why the project is needed, the issues of concern, the existing condition of the project area, and the expected consequences of each alternative, including a “no action” alternative.

On July 29, 2001 a severe thunderstorm flooded the Shelton Laurel and Little Laurel areas in Madison County. One week later on August 4 another storm flooded the same area with eight inches of rain in a three-hour period. As a result of the flooding, forest system roads on Hickey Fork, Big Creek, Dry Creek, and Rich Mountain were damaged. Most of the damage was relatively easy to repair; however, a portion of the entire roadbed on the lower portion of Hickey Fork road was destroyed. Wood debris, rocks and silt have been deposited in and along Hickey Fork Creek affecting drainage patterns. Damage along Hickey Fork road is extensive. Due to the amount of damage and debris in the road, the Hickey Fork Road has been gated until a decision is made on how to proceed. In addition, hiking trails including Hickey Fork, Jerry Miller, Whiteoak Flats, and Laurel River were also damaged.

Repairs have already been completed on Big Creek, Dry Creek, and Rich Mountain roads. Emergency stabilization measures consisting of opening culverts and constructing water bars by hand have also been completed on the Hickey Fork road. Most of the damage to the trails has been repaired except for the trail bridge at the beginning of Hickey Fork Trail. All of this work was completed under maintenance authority with a great deal of assistance from volunteers. The trail bridge is scheduled to be replaced in 2006.

This area experienced a major storm in July of 1999 that resulted in major damage to the Hickey Fork Road. Approximately \$500,000 was spent on repairs to fix similar damage from this storm; some of that investment was lost in these most recent storms.

Damage from the storms requires the Forest Service to do extensive repair and stabilization in the Hickey Fork area. This EA documents the results of site-specific analysis concerning a proposal to repair and restore the Hickey Fork road, Forest Service Road (FSR) 465, on the Appalachian Ranger District.

# 1 PURPOSE AND NEED FOR ACTION

## 1.1 Proposed Action

Proposed activities within the Hickey Fork area include road restoration and protection of road embankments along the Hickey Fork Road, including approximately 1050 feet of road relocation, stream bank stabilization along East Prong Hickey Fork Creek, installation of rock vanes for protection of the restored road bed, and culvert replacement and repair. The damaged area begins approximately 500 feet northeast of the Forest Service property line along Hickey Fork Road and continues northeast along the road for approximately 2.9 miles. A map showing the locations of the damaged areas is included in Appendix A. The project area of approximately 3,941 acres is located in the Hickey Fork drainage and a portion of the Whiteoak drainage. The analysis area is located on the Appalachian Ranger District in Management Areas 2C, 3B, 4D, 5, 14 and 18 and in Compartments 407, 408, 409, 410, 412 and 413. A map showing the location of the management areas within the project area is located in Appendix A.

All actions contribute to achieving the goals, objectives, and desired future conditions identified in the Land and Resource Management Plan for the Nantahala and Pisgah National Forests issued in April 1987 and as amended (here after referred to as the Forest Plan). This EA is tiered to the Forest Plan and its Final Environmental Impact Statement (FEIS), the Vegetation Management in the Appalachian Mountains (VMAM) FEIS issued in July 1989, and the Roads Analysis Process Report for the Nantahala and Pisgah National Forests (NP RAP) issued in January 2003. The management direction given in the Forest Plan for the six MAs located in the project area is as follows:

- Management Area 2C (906 acres): emphasizes visually pleasing scenery and motorized recreation use. These areas are classed as not suitable for timber production. Provide motorized recreation opportunities, favoring driving for pleasure. Provide some non-motorized recreation opportunities including day-use hiking, viewing wildlife, and access for fishing. Provide conditions for the large group of game and non-game animals that benefit from older forests and tolerate vehicular disturbance.
- Management Area 3B (427 acres): emphasizes sustainable supply of timber, but with few open roads and limited disturbance associated with motorized vehicles. Provide limited access for motorized vehicles. Provide non-motorized recreation opportunities including hunting, access for fishing, wildlife viewing, horseback riding, bicycle riding, and hiking. Provide conditions for the large group of game and non-game animals that benefit from young to middle-aged forests and cannot tolerate motorized vehicular disturbance.
- Management Area 4D (946 acres): emphasizes high quality habitats for wildlife requiring older forests and freedom from disturbance of motorized vehicles. Provide limited access for motorized vehicles. Early successional habitat is provided in conjunction with managing suitable timberland in these areas. Provide non-motorized

recreation opportunities including hunting, access for fishing, wildlife viewing, horseback riding, bicycle riding, and hiking. Provide conditions for the large group of game and non-game animals that benefit from a variety of mostly mature forest conditions and cannot tolerate vehicular disturbance.

- Management Area 5 (1002 acres): emphasizes providing large blocks of backcountry where there is little evidence of humans or human activities other than recreation use. Manage all roads as closed to public vehicular use. Provide non-motorized recreation opportunities including hiking, viewing wildlife, hunting, and access for fishing. Provide conditions for the large group of game and non-game animals that benefit from older forests and cannot tolerate vehicular disturbance.
- Management Area 14 (660 acres): emphasis for this area is in accordance with the National Trails Systems Act and carried out through the Cooperative Management System as defined in the Appalachian Trail Comprehensive Plan. This management area consists of the Appalachian National Scenic Trail and its foreground as mapped through the Visual Management System.
- Management Area 18 (Acreage for MA18 is embedded in other MAs): These riparian management areas consist of aquatic ecosystem, riparian ecosystem and closely associated plant and animal communities.

## 1.2 Purpose and Need for Action

The purpose of the actions in the project area is to: protect resource values and public safety; meet Forest Plan direction and standards for access, forest and wildlife management, and recreational opportunities; and reduce the threat to property.

## 1.3 Project Objectives

The road and stream bank stabilization work would prevent long-term degradation of aquatic and riparian habitats of the entire project area by greatly reducing the extent of further stream bank damage and sedimentation that would continue to occur without treatment. Stabilization would also improve the visual/aesthetic values of the damaged areas. Repair of the transportation system would provide for continuation of public motorized access and administrative access for fire and law enforcement protection and to achieve future management opportunities established in the Forest Plan.

The damaged portions of the road are primarily located in Management Area (MA) 2C which encourages motorized access for the purpose of viewing scenery. However, a portion of the Hickey Fork road is located along the boundary of MA 4D. The East Fork of Hickey Fork Creek is the actual boundary between the management areas until the split of the creek into Hickey Fork Creek and Little Prong Creek. The Hickey Fork road is within 100 feet of the boundary between MAs 2C and 4D and the road does not provide access into MA 4D.

According to the Forest Plan (p. III-66), MA 2C is to be managed as Roaded Natural 1 (RN1), which provides public access on National Forest System roads. A desired future condition for MA 2C is to provide motorized opportunities, favoring driving for pleasure. In addition, provide some non-motorized recreation opportunities including day-use hiking, viewing wildlife, and access for fishing. A desired future condition for MA 4D is to provide limited access for motorized vehicles and non-motorized recreational opportunities including hunting, access for fishing, viewing wildlife, horseback riding, bicycle riding, and hiking.

Restoring the Hickey Fork road would maintain access to MA 2C for driving for pleasure and provide vehicular access to the area for fishing, hiking, hunting, and wildlife viewing. Part of this open access would be adjacent to the boundary of MA 4D; however, managing the Hickey Fork road as open would not provide access into the interior of MA 4D.

MAs 3B and 4D are suitable for timber production. There are about 1,373 acres (35%) of the analysis area located in these management areas. Restoring the Hickey Fork road would maintain administrative access into these areas for conducting timber management activities.

Desired future conditions for wildlife management in the analysis area cover a broad spectrum ranging from managing for game and non-game species that desire young to middle-aged forests to older forests and species able to tolerate vehicular disturbance to those that cannot tolerate vehicular disturbance. Restoring the Hickey Fork road would maintain administrative access into these areas for conducting wildlife management activities including maintenance of grass/forb openings as directed in the Forest Plan (p. III-23) and using timber management practices as the primary tool to create desired wildlife habitat in MAs 2C, 3B, and 4D (Forest Plan, pp. III-68, 74, and 84).

## **1.4 Decision Framework**

The District Ranger will use the information in this analysis to decide whether or not the Forest Service will relocate a portion of the road, stabilize stream banks, repair and replace culverts, install rock vanes, or repair and restore the Hickey Fork road, and if so, how to proceed. Other government agencies, groups, individuals, and Forest Service personnel interested and concerned about the potential outcome of this project will also use this publication as a basis for critiquing the various courses of action. If an action alternative is chosen, Forest Service personnel will use this document to guide in implementation and monitoring.

## **1.5 Public Involvement**

A letter describing the proposed action and requesting comments on the proposal to repair and restore the Hickey Fork road was mailed to 93 individuals, groups, and organizations on October 2, 2001. The letter sent by the District Ranger requested comments by November 2, 2001. We received responses to the proposal from sixteen individuals, groups, and organizations.

This project has appeared in the Schedule of Proposed Actions for the National Forests in North Carolina, which is published quarterly since January of 2002. On March 25, 2002, District Ranger Paul Bradley signed a Categorical Exclusion documenting his decision to restore the Hickey Fork road. Requests were received for additional documentation and more comprehensive environmental analysis of this decision. On April 29, 2002, District Ranger Bradley made the decision not to implement the road restoration until additional analysis and documentation were completed and available for public review. Additional comments were requested by May 20, 2002. No additional comments were received. On March 7 of 2003, District Ranger Bradley issued a preliminary EA for comment. Sixteen individuals, groups, and organizations responded to the preliminary EA. Many of the comments received requested more detailed analysis to properly evaluate and comment on the proposed action. Due to the concern over the lack of detailed information, no decision was made at that time.

Additional analysis including development of a more detailed engineering design for the proposed action has been conducted over the past two years and is documented in this environmental assessment. These engineering plans were developed using input from the United States Army Corps of Engineers (ACoE) and the Divisions of Water Quality (DWQ) and Land Quality (DLQ) of the North Carolina Department of Environment and Natural Resources (NCDENR).

## **1.6 Key Issues Considered and Discussed Throughout this Analysis**

The key issues associated with this proposed project were identified through a public participation process, which included input from Forest Service natural resource specialists, other government agencies, private groups and individuals. A Forest Service Interdisciplinary Team (IDT) identified that the following issues are relevant to the decisions to be made concerning the Hickey Fork Storm Damage Restoration Project. Issues 1-6 directly influenced the initiation, development, and technical design of the project.

### **1.6.1 Issue 1: Impacts to Water Quality**

- Soil and debris from the flood events is currently a source of sediment for the streams in the project area.
- The proposed restoration activities may have short-term negative impacts on water quality and aquatic habitat in the project area.

**Indicator: Water Quality Protected (Yes/No)**

### **1.6.2 Issue 2: Recreational Use of the Project Area**

- Closing the Hickey Fork road permanently would change some types of recreational opportunities available to the public in the project area.

**Indicator: Recreational Opportunities Available (Types)**

### 1.6.3 Issue 3: Roaded Access into the Project Area

- Closing the Hickey Fork road permanently would block access to the public for motorized recreational opportunities such as driving for pleasure and motorized access to recreational activities such as day-use hiking, viewing wildlife, and access for fishing.
- Closing the Hickey Fork road permanently would block administrative motorized access to the area for forest and wildlife management, stream surveys, monitoring peregrine falcon nesting sites, law enforcement, and fire protection.

**Indicator: Roads Open to Public in the Project Area (miles)**

### 1.6.4 Issue 4: Impacts to Wildlife Habitat

- Closing the Hickey Fork road permanently would block access to existing wildlife fields and end active management and maintenance of the grass/forb habitat in the project area.
- Closing the Hickey Fork road permanently would block administrative access to the area and severely limit opportunities for creation of wildlife habitat using forest management.

**Indicators: Early Successional Habitat in 10 years (acres)**

**Grass/forb Habitat in 10 years (acres)**

**Opportunities for Creating new Early Successional Habitat (acres)**

**Opportunities for Creating new Grass/forb Habitat (acres)**

### 1.6.5 Issue 5: Health and Safety

- In its current condition, the Hickey Fork road poses a safety hazard for those trying to access the area using this road.
- Loss of vehicular access to the Hickey Fork area would add significant time and effort to the rescue of hikers or hunters in the area and for fire control.

**Indicators: Safety of Visitors Improved (Yes/No)**

**Access Provided for Rescue and Fire Control (Yes/No)**

### 1.6.6 Issue 6: Economic Considerations

- The cost of rebuilding the road would be expensive.

**Indicator: Estimated Cost of Implementing Alternatives (Dollars)**

## 1.7 Non-Key Issues Considered

The Hickey Fork IDT evaluated and addressed the following issues (resources) and eliminated them from further study in this Environmental Assessment as directed by CEQ Regulation 1500.1(b), 1500.2(b) and other sections because the project would cause only inconsequential effects to each issue or resource.

### 1.7.1 Non-Key Issue A: Protection of Botanical Resources

The proposed action may negatively affect threatened and endangered or sensitive plant populations.

David Danley, Forest Service Botanist, reviewed the damage, the proposed actions, and the botanical analysis written for the 1999 Hickey Fork Storm Damage project. Additional botanical surveys were conducted in May of 2004. These surveys included searching for presence of *Hydrotheria venosa*. Prior to the storms, the Regional Forester's sensitive plant *Hydrotheria venosa* was known to exist downstream of the project area. It was unknown whether the plant still existed in the analysis areas after the 2001 storms until these 2004 surveys. No evidence was found that *Hydrotheria venosa* still occurs within the analysis area. It is believed that the extreme force of the water from the storms possibly combined with large sediment deposits associated with the storms caused the extirpation of the species from the analysis area.

There are no Regional Forester's listed sensitive plants known or expected in the project area. No proposed or listed Federally Threatened or Endangered or Forest Concern plant species are known to exist or are likely to exist in or near the proposed activity area. This project will not affect any proposed or listed Federally Threatened or Endangered plant species and consultation with the United States Fish and Wildlife Service is not required.

### 1.7.2 Non-Key Issue B: Protection of Threatened, Endangered, Sensitive, and Forest Concern Wildlife Species

The proposed action may negatively affect threatened and endangered or sensitive wildlife populations.

Sandy Burnet, Forest Service Wildlife Biologist, reviewed the proposed actions and conducted a wildlife analysis on the project area. There are no known proposed or listed Federally Threatened or Endangered wildlife species or habitat within this watershed. There are five snail species listed on the Regional Forester's sensitive species list known to occur in the vicinity but outside the project area. There is one Forest Concern snail species (Lamellate supercoil, *Paravitrea lamellidens*) and Forest concern butterfly species (gold-banded skipper, *Autochton cellus*) known to occur in the vicinity but outside the project area.

Four of the sensitive snail species (sculpted supercoil, *Paravitrea ternaria*; Talus coil, *Helicodiscus triodes*; Roan supercoil, *Paravitrea varidens*; and glossy supercoil, *Paravitrea placentula*) are known in the county but outside of the activity area. The record of occurrence for the bidentate dome, *Ventridens coelaxis*, is in the area of the east branch of upper East Prong Hickey Fork Creek where the road and proposed work is parallel to the west branch of this creek. The flood event would have destroyed any snail species within the immediate area of the creek. Surveys were conducted in the spring of 2004 and result in no sensitive or Forest Concern snail species being found within the vicinity of Hickey Fork Creek and the areas proposed for treatment.

The gold-banded skipper is a resident butterfly species whose caterpillar stage is during late spring when they can forage on hog peanut plants. No hog peanut plants were observed within the activity area where dog hobble is too thick to allow for a diverse herbaceous layer. Adults will be able to take flight if they are in the area of heavy earth moving equipment. Therefore, there will be no direct, indirect, or cumulative effects to this species.

There are no known Federally Threatened or Endangered wildlife species or their habitat within the activity area; therefore, consultation with U.S.D.I. Fish and Wildlife Service is not required. There will be no direct, indirect, or cumulative effects to any Regional Forester's sensitive species. There will be no direct, indirect, or cumulative effects to any Forest Concern species.

### **1.7.3 Non Key Issue C: Protection of Threatened, Endangered, Sensitive, and Forest Concern Aquatic Species**

There are 4 common species of fish within the East Fork Prong of Hickey Fork and there are 18 species of fish within Shelton Laurel Creek. Federally Threatened and Endangered and Forest Sensitive (TES) species were originally considered from the Forest's species list. Several of the species were considered for further analysis because they were listed by the North Carolina Wildlife Resources Commission, North Carolina Natural Heritage Program, and U.S. Fish and Wildlife Service as occurring or probably occurring in Madison County. Of the 35 species listed for Madison County, all but 4 were dropped from this analysis based on field surveys, habitat presence and existing elements of occurrence (See Table 1-1).

The proposed activities would have no effect on any TES aquatic species or their habitat. There will be no direct, indirect or cumulative impacts to TES aquatic species as a result of implementation of this project.

The proposed project may indirectly or directly affect the listed Forest concern species in Table 1 of this document due to the removal of riparian vegetation and associated disturbances with either of the action alternatives. The Forest concern species include *Cryptobranchus alleganiensis*, *Ceraclea slossonae*, *Heterocleon petersi*, and *Serratella spicilosa*. If these species are present in East Prong Hickey Fork, it is unlikely that there would be any impacts on population viability across the Forest. Individuals may be crushed during culvert removals or replacements or during rock vane construction however, no cumulative impacts to any aquatic species are likely to occur.

**Table 1-1. Potential Threatened, Endangered, Sensitive, and Forest Concern species evaluated for the proposed Hickey Fork Project**

Species	Type	Brief Habitat Description	Occurrence
<b>Federally Threatened and Endangered species</b>			
None			
<b>2002 Regional Forester's Sensitive Species</b>			
None			
<b>Forest Concern Species</b>			
<i>Cryptobranchus alleganiensis</i> (Hellbender)	Amphibian	Lotic-clean substrate streams and rivers	Known to occur in aquatic analysis area.
<i>Ceraclea slossonae</i> (a caddisfly)	Caddisfly	Lotic-streams and rivers	May occur in the aquatic project and analysis areas.
<i>Heterocleon petersi</i> (a mayfly)	Mayfly	Lotic	May occur in the aquatic project or analysis area.
<i>Serratella spicilosa</i> (spicilose serratellan mayfly)	Mayfly	Lotic	May occur in the aquatic project and analysis areas.

#### 1.7.4 Non Key Issue D: Management Indicator Species

Proposed improvement to Hickey Fork Road may affect Management Indicator Species (MIS).

Implementation of the proposed project may indirectly impacts individuals of the rainbow trout community. These impacts are expected to be short term and will cease with site rehabilitation. There will be no impacts to the long-term viability of this rainbow trout population or the populations across the Forest. There are no other direct, indirect, or cumulative impacts expected to any other MIS. See the MIS report in Appendix C for the detailed analysis of the impacts of the proposed actions to MIS.

#### 1.7.5 Non Key Issue E: Protection of Heritage Resources

This project may adversely affect heritage or cultural resources in the project area.

An archeologist has conducted a heritage resource review of the proposed project area and identified areas of high probability of occurrence of heritage resources. The road realignment will take place in very steep, rocky areas with a low probability of archeological resources. A zone archeologist or heritage resource technician will monitor road restoration activities along the Hickey Fork road and activities in all high site probability areas. The proposed project has no potential for effect, adverse or beneficial, to a heritage resource and therefore is an Exempt

Undertaking, no further Section 106 compliance documentation is required, other than the monitoring mitigation listed above.

If during the implementation of a ground disturbing activity, a previously unknown archeological or historic site is encountered the disturbance would stop immediately. The activity would not be permitted to continue until a forest archeologist surveys and evaluates the site and makes a recommendation to permanently stop, modify, or proceed with the activity using appropriate mitigation measures. There are no expected direct, indirect, or cumulative effects on heritage resources from any of the alternatives.

### **1.7.6 Non-Key Issue F: Risk of Road Failure in the Future**

What is the likelihood of the restored road suffering another failure due to flooding in the future?

There is no definitive answer to this question; however, the three flood events that resulted in the previous failures of the road were individually very unusual rainfall events. The fact that three of these events took place in a period of about two years was highly unlikely and unpredictable. Prior to the floods in 1999 and 2001, there had been no significant flood events along this road at least as far back as the 1940s. The exact date of the original road construction is unknown; however, the Civilian Conservation Corps (CCC), which was active in the 1930s and early 1940s, built at least one bridge on the Hickey Fork road.

Although the Hickey Fork road is located adjacent to the creek, the location of the original road prism is located above the typical flood zone of the creek. Proposed restoration techniques include repair techniques that would reduce the extent of damage in the unlikely event of another flood. Therefore, we believe based on the rainfall history in the project area, the location of the road above the typical flood zone, and the restoration techniques proposed that it is unlikely that there will be another catastrophic loss of road investment due to flooding in the Hickey Fork area in the next 25 to 50 years. However, since floods are natural disasters, there can be no guarantee that another catastrophic flood will not happen in the Hickey Fork area in the next 50 years.

### **1.7.7 Non-Key Issue G: Special Geographic Areas**

This project must be evaluated for its effects on unique characteristics of the geographic area in the project area.

There are no park lands, prime farmland, wetlands, wild and scenic rivers, or ecologically critical areas that will be affected by the proposed actions.

## 1.8 Issues Beyond the Scope of this Analysis

The Hickey Fork IDT has determined that the following issues are beyond the scope of this Environmental Assessment.

### 1.8.1 Enforcement of Closures to ORV's

**Issue AA:** It was suggested that existing closures of areas to ORV's include the use of significant barriers and substantial enforcement of the closures.

**Reason this Issue is Beyond the Scope of this Analysis:** The enforcement of laws and investigations concerning illegal ORV use are functions of the Law Enforcement division of the Forest Service. Forest Service Law Enforcement will continue to patrol the area and enforce existing closures.

### 1.8.2 Closing the Area to Logging and Re-zoning the Area for Recreation

**Issue BB:** A suggestion was made to permanently close the area to logging and to re-zone the area for recreation use such as hunting and fishing only.

**Reason this Issue is Beyond the Scope of this Analysis:** Timber harvesting is an approved use of National Forest System land as set forth by laws that regulate Forest Service activities. The Forest Plan for the Nantahala and Pisgah National Forests identifies areas where timber harvesting is an appropriate activity in accordance with rules and regulations based on these laws by dividing the forest into management areas. Some management areas allow timber harvesting and others do not. Management areas designations were decided in the Forest Plan. It is outside this scope of this analysis to change the management area designations within the project area. However, Alternatives A and B would change the character and use of the area and would introduce discussions on changing the management area designations during in the next Forest Plan reanalysis.

## 1.9 Project Record

This EA incorporates by reference the project record (40 CFR 1502.21) The project record contains specialists reports and other technical documentation used to support the analyses and conclusions in this EA. The specialists reports provide additional detailed analysis. This EA incorporates by reference the Nantahala and Pisgah Management Indicator Species (MIS) Report. The MIS Report along with Monitoring and Evaluation Reports for the National Forests in North Carolina contain the most current information about forest population trends for MIS.

## 2 ALTERNATIVES

### 2.1 Introduction

The Alternatives Chapter is the heart of the Environmental Assessment. This chapter briefly describes three alternatives in detail. Alternative A: No Action, Alternative B: Stabilize and Close Hickey Fork Road, and Alternative C: Repair and Restore Hickey Fork Road.

### 2.2 Alternatives Considered

#### 2.2.1 Alternative A: No Action

This alternative serves as the no action alternative. Flooding extensively damaged the Hickey Fork road. There is debris in the road and Hickey Fork Creek. The road in effect has been closed as a result of soil and debris blocking passage. The road would remain gated and closed to vehicular traffic and sediment would continue to enter the creek from the flood deposited debris during storm events. As a result of the road closure, the public would have access to the area for recreational activities such as hiking, hunting, and fishing only on foot. There would be no administrative access to the area, other than on foot, for activities such as forest and wildlife management, stream surveys, and monitoring peregrine falcon nesting sites. In addition, there would be no vehicular access to the area from North Carolina for emergency services such as fire suppression, law enforcement, or search and rescue.

#### 2.2.2 Alternative B: Stabilize and Close Hickey Fork Road

This alternative was developed to provide for stabilizing the stream banks and reestablishing the roadbed as needed to serve as a trail; however, it would result in the closure of the road to motorized traffic. Alternative B meets some of the objectives of the project as described in Section 1.3. This alternative would provide for the protection of water quality and aquatic habitat, basic resource protection, public safety, reduced threat to property, and non-motorized public access through the damaged areas. The following activities are proposed in Alternative B:

- ❖ Stabilize approximately 500 feet of severely damaged stream bank along East Prong Hickey Fork Creek using a combination of bioengineering techniques such as the establishment of native plant cuttings and planting of vegetation.
- ❖ Remove culverts along the Hickey Fork road.

- ❖ Repair slide areas using hydro- and manual seeding.
- ❖ Close the Hickey Fork road and convert to a trail.
- ❖ Eliminate the Whiteoak Trailhead and build a new trailhead and parking area at the end of the Hickey Fork road.
- ❖ Fallen trees, limbs and dislodged brush within the cross section of the existing or original stream channel up to and including the debris line shall not be removed unless identified for removal by the Forest Hydrologist.

With this option, access to the Hickey Fork Area would be limited to foot travel beyond the gate just below where the bridge for Hickey Fork trail was destroyed. There would be no motorized administrative access to the area for activities such as forest and wildlife management, stream surveys, and monitoring peregrine falcon nesting sites. There would be no vehicular access to the area from North Carolina for emergency services such as fire suppression, law enforcement, or search and rescue.

### **2.2.3 Alternative C: Proposed Action (Repair and Restore Hickey Fork Road)**

This alternative was developed to meet the objectives of the project as described in Section 1.3. Alternative C would provide for the protection of water quality and aquatic habitat, basic resource protection, public safety, reduced threat to property, and motorized public and administrative access through the damaged areas. Copies of the engineering repair plans are available in the project file. The following activities are proposed in Alternative C:

- ❖ Restore road and protect road embankments along the Hickey Fork Road.
  - Site 1 (Stations 8+00 to 10+50): Remove old gabions and repair fill slope failure by installation of a rock embankment and protect the restored road with the installation of a special rock embankment and rock vanes. Temporary dewatering of the stream will be required at this site.
  - Site 2 (Stations 16+80 to 18+00): Place fill material (rock) at bridge approaches. Reinforce bridge using concrete under wing walls and footings of bridge. Reshape ditch and place riprap along road edge. If needed, a temporary bridge will be installed over the existing bridge during project implementation. Temporary dewatering of the stream will be required at this site.
  - Site 3 (Stations 20+50 to 24+00): Reshape ditch for about 270 feet. Shift road alignment two to three feet into the existing embankment and install a rock embankment.
  - Site 3a (Stations 29+00 to 35+60): Install rock vanes for the protection of the restored road.

- Site 4: Obliterate road from Station 34+50 to Station 44+90 and construct a new section of road (approximately 1050 feet) above the existing road and out of the flood plain. Armor, with boulders, the section of the new road directly adjacent to the stream. Temporary dewatering of the stream will be required at this site. The dewatered stream area would serve as a work area during project implementation.
  - Site 5: Reshape and repair slope from Station 46+50 to 57+50. Reshaping will include shifting of the roadbed into the existing embankment, removal of rock from the existing embankment, and placing of riprap for fill protection. Install rock vanes between stations 50+00 and 61+00 for protection of the restored road.
  - Site 6 (Stations 65+30 to 66+65): Place fill material (rock and large boulders) to repair slope and as needed to restore the road prism. Install rock vanes between stations 65+00 and 67+00 for protection of the restored road.
- 
- ❖ Repair slide areas using hydro- and manual seeding.
  - ❖ Clean out culverts as needed. Remove existing damaged culverts and install new culverts as needed and indicated in the construction plans.
  - ❖ Fallen trees, limbs and dislodged brush within the cross section of the existing or original stream channel up to and including the debris line shall not be removed unless identified for removal by the Forest Hydrologist.
  - ❖ Stabilize approximately 500 feet of severely damaged stream bank along East Prong Hickey Fork Creek using a combination of bioengineering techniques such as the establishment of native plant cuttings and planting of vegetation.

Under this alternative, the Hickey Fork area would have public motorized access for recreation opportunities and administrative access for forest and wildlife management, fire, law enforcement, and other emergency services.

## 2.3 Design Features

The following design features will be built into the implementation of the project and are required for unavoidable actions associated with the proposed resource management in both Alternatives B and C. Unless otherwise stated, the determination of effects considers the successful implementation of these measures. Should a mitigation measure be implemented and subsequently fail, corrective measures must be taken and appropriate Forest Service officials notified immediately.

1. Adequate sedimentation and erosion control measures must be implemented prior to any ground disturbing activities to minimize impacts to downstream resources. Examples of this are the installation of silt fences and hay bales where flow parallels the work area.

2. Temporary vegetation (e.g. grass seed and mulch) or erosion control mat should be placed on soil expected to remain bare greater than 48 hours between the implementation phases of the project. Permanent vegetation (e.g. planting other than cuttings associated with bioengineering) should be seeded within 15 days of the completion of the project. If it appears that vegetation will not be established before the growing season is over, erosion control fabric or other similar material should be placed over the bare soil until the spring growing season allows for vegetation to be established. These actions will minimize the amount of bare soil (and hence erosion and sedimentation potential) during and after project implementation.
3. Work within the stream channel should be conducted in a dry work area and stabilized before water is diverted where possible.
4. Only clean, sediment-free rock should be used for bank stabilization.
5. Native trees and shrubs should be planted along the stream bank to re-establish the riparian area and to provide long-term bank stability and cover for fish and wildlife.
6. Construction within the 25-foot buffer area (as identified by the North Carolina Wildlife Resources Commission) is prohibited during the trout spawning period of October 15 to April 15 in order to protect egg and fry stages from sedimentation.
7. Any spoil materials must be disposed of off-site, and not threaten any aquatic resources.
8. All mechanized equipment operated in or near surface waters should be inspected and maintained regularly to prevent contamination of stream waters by fuels, lubricants, hydraulic fluids, or other materials.
9. Fueling of all vehicles and equipment should be done in a manner that prevents contamination of stream waters by fuel.
10. Rocks needed for the site repair may not be excavated from Forest Service lands unless created as a direct byproduct of the repair efforts.
11. Soil storage, if needed, will be minimized and temporary in nature.
12. If during the implementation of a ground disturbing activity, a previously unknown archeological or historic site is encountered the disturbance would stop immediately. The activity would not be permitted to continue until a forest archeologist surveys and evaluates the site and makes a recommendation to permanently stop, modify, or proceed with the activity using appropriate mitigation measures.

## **2.4 Alternatives Considered But Not in Detail**

An alternative was considered that would have stabilized and closed the Hickey Fork road as described in Alternative B and built a new road into the area in a location away from Hickey Fork Creek. This alternative was considered and reviewed by our engineers and they determined that this was an impractical alternative because the terrain of the area is very limiting and it would be very difficult to locate and build a new road. In addition, the costs of stabilizing the road and stream banks and the costs of building a new road in very difficult terrain would have been extreme; therefore, this alternative was dropped from further consideration.

We received comments identifying specific routes to be considered for road access. All of these routes were reviewed and dismissed for various management reasons. One of the suggested routes recommended connecting the existing road at Bearwallow Gap, FSR 42, with the existing road to Huckleberry Gap, FSR 465. The connector for these roads would be located in Management Area 14 which consists of the Appalachian National Scenic Trail and its foreground corridor. New road construction in this Management Area can only be considered when it is the only feasible alternative for location of a needed road; therefore, this alternative was dropped from further consideration.

## 2.5 Summary Comparison of Actions

**Table 2-1 SUMMARY OF ACTIONS**

Actions	Alternative A	Alternative B	Alternative C
Stabilize Stream banks and Road, and Repair Slide Areas	No	Yes	Yes
Culverts and Bridges along Hickey Fork Road	Bridges and Culverts would remain in their current condition	Existing culverts along the Hickey Fork road would be removed	Replace and Repair culverts damaged as a result of the flooding as needed
Close Road	The road has closed itself with soil and debris from the flood	Yes	No
Repair and Restore Road	No	No	Yes
Construct a new Trailhead and Parking area at the end of Hickey Fork Road and Close the Whiteoak Trailhead	No	Yes	No

## 2.6 Summary Comparison of Environmental Effects

**Table 2-2 SUMMARY OF EFFECTS**

Issues	Indicators	Alternative A		
<p><b>ISSUE 1: IMPACTS TO WATER QUALITY</b></p>	<p>Protection of Water Quality  Yes/No</p>	<p>No</p>	<p>Yes</p>	<p>Yes</p>
<p><b>ISSUE 2: RECREATIONAL USE OF THE PROJECT AREA</b></p>	<p>Types of Recreational Opportunities Available</p>	<p>Fishing, hiking, hunting and wildlife viewing.  Opportunities for successful fishing may decrease if water quality is degraded.  Opportunities for viewing song birds and other wildlife dependant on early successional habitat may decrease over time as this habitat decreases.  Additional backcountry and primitive recreational experiences.</p>	<p>Additional hiking opportunities by converting the road to a trail.  Fishing, hiking, hunting and wildlife viewing.  Opportunities for viewing song birds and other wildlife dependant on early successional habitat may decrease over time as this habitat decreases.  Additional backcountry and primitive recreational experiences.</p>	<p>Driving for pleasure and sight seeing  Motorized Access to non-motorized Recreation such as fishing, hiking, hunting and wildlife viewing.  Fewer primitive and backcountry recreational opportunities.</p>
<p><b>ISSUE 3: ROADED ACCESS INTO THE PROJECT AREA</b></p>	<p>Miles of Open Road</p>	<p>0.9 miles</p>	<p>0.9 miles</p>	<p>6.2 miles</p>

Issues	Indicators	Alternative A		
<p><b>ISSUE 4: IMPACTS TO WILDLIFE HABITAT</b></p>	<p>Acres of early successional expected in next 10 years</p>	<p>0 acres</p>	<p>0 acres</p>	<p>40 acres</p>
	<p>Acres of grass/forb habitat in 10 years</p>	<p>0 acres</p>	<p>0 acres</p>	<p>7 acres</p>
	<p>Opportunities to Create New Early Successional Habitat</p>	<p>Very limited</p>	<p>Very limited</p>	<p>Yes</p>
	<p>Opportunities to Create New Grass/forb Habitat</p>	<p>No</p>	<p>No</p>	<p>Yes</p>
<p><b>ISSUE 5: HEALTH AND SAFETY</b></p>	<p>Safety of Visitors Improved</p>	<p>No</p>	<p>Yes</p>	<p>Yes</p>
	<p>Access Provided for Rescue and Fire Control</p>	<p>No</p>	<p>No</p>	<p>Traditional Vehicular Access</p>
<p><b>ISSUE 6: ECONOMIC CONSIDERATIONS</b></p>	<p>Estimated Cost of Implementing Alternatives (Dollars)</p>	<p>\$30,000</p>	<p>\$835,000</p>	<p>\$1,100,000</p>

## **3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS**

### **3.1 Introduction**

This section describes the existing environment in and around the project area and forms the scientific and analytical basis for the comparison of alternatives as required by the National Environmental Policy Act (NEPA). This chapter presents the predicted effects of the three alternatives listed in section 2.2, focusing on the project objectives listed in section 1.3 and the six issues listed in section 1.6.

### **3.2 Impacts to Water Quality**

Lorie Stroup, Forest Service Fisheries Biologist, reviewed the Biological Evaluation (BE) written for the 1999 Hickey Fork Storm Damage project and wrote a new BE and aquatic analysis for this project. The BE is included as Appendix B of this document.

#### **3.2.1 Existing Conditions (Water Quality)**

The majority of the stream structures put into place as part of the 2000 Hickey Fork Creek stream restoration project remained in tact and functioning during and following the two flood events in 2001. The flooding severely damaged stream banks along East Prong Hickey Fork Creek. Soil and debris moved as a result of the flooding is currently a source of sediment for the streams in the project area. The eroding stream banks within the project area are causing periodic pulses of suspended sediment within the water column during any precipitation event. This suspended sediment results in turbidity, which is associated with negative effects on the spawning, growth and survival rate of aquatic organisms. This sediment could affect local and downstream aquatic habitat and population quality and quantity.

No rare aquatic species are known to, are likely to, or may occur within the project area based on an analysis of existing (pre-1999 flood) and on July 22, 1999 aquatic invertebrate samples from the flood damaged area which revealed no aquatic insects. Numerous aquatic insects were found upstream of the damaged area and revealed no rare species.

The proposed project lies within the Land and Resources Management Plan (LRMP) watershed 38, which is the French Broad River watershed. The aquatic project area includes the East Prong of Hickey Fork Creek and Shelton Laurel Creek. The East Prong of Hickey Fork Creek is considered by the NC Department of Natural Resources Division of Water Quality as a class "C" water and Shelton Laurel Creek is designated class "C Tr" waters. The "C" classification indicates waters suitable for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. The "Tr" classification denotes waters suitable for natural trout propagation and maintenance of stocked trout.

Aquatic habitat in the East Prong of Hickey Fork consists of an evenly distributed pool to riffle ratio dominated by primarily gravel substrate. Several areas of stream bank are exposed soil and contain no riparian vegetation including several land slides within the area. There is an abundance of large woody debris (LWD) within the stream channel and in the floodplain as a result of the recent floods within the area. The lower section (downstream of USFS property boundaries) of the East Prong of Hickey Fork is located on private lands. Impacts including residence built adjacent to the stream and the cutting of riparian vegetation along the stream bank increases instability and reduces the amount of cover and LWD available for aquatic species. Grazing and agriculture have also historically been practiced along the stream banks of East Prong Hickey Fork which causes compaction and off site movement of soil.

Shelton Laurel Creek is impacted from private use of land as well. There is grazing and other agricultural use of the stream banks occurring as well as residences built adjacent to the stream. Bridges were washed out during the September storms of 2004 therefore new footings requiring new disturbances along the stream banks have been taking place over the last year.

### **3.2.2 Environmental Effects of Alternative A on Water Quality**

Water quality will continue to decline within the East Prong of Hickey Fork. Currently stream banks are eroding and very unstable and unsafe for the public. If no action is taken, the existing condition will perpetuate itself and further degradation of water quality will occur. Off-site movement of soil from eroding stream banks will potentially “fill in” interstitial space that is valuable habitat for aquatic macroinvertebrates, fish eggs and juveniles. This may have negative impacts on the aquatic organisms within the East Prong of Hickey Fork. Alternative A would have no effect on any Federally listed or sensitive species as none are known to occur within this section of the East Prong of Hickey Fork or Shelton Laurel Creek. Implementation of this project may indirectly impact individuals of the Forest Concern species list for this project from sedimentation and loss of riparian habitat. These species are *Cryptobranchus alleganiensis*, *Ceraclea slossonae*, *Heterocleon petersi*, and *Serratella spicilosa*.

### **3.2.3 Environmental Effects of Alternative B on Water Quality**

Alternative B involves the decommissioning of the existing road and restoring the damaged sections of East Prong Hickey Fork Creek. This alternative will involve the removal of existing culverts, repair of slide areas using hydro and manual seeding, the elimination of the Whiteoak Trailhead and building of a new parking area at the end of Hickey Fork road. Temporary fluctuations of sediment and turbidity will occur during project implementation. More mobile organisms, such as hellbenders and fish, will likely elude the disturbed areas and retreat upstream or downstream. Either of the action alternatives will be conducted outside the spawning moratorium (Oct. 15- April 15) and will therefore have little to no impacts on eggs and juveniles.

The removal of culverts may have direct impacts on individuals of Forest concern species *Ceraclea slossonae*, *Heterocleon petersi*, and *Serratella spicilosa*. The crushing or smothering

of individuals of these species is unlikely to occur as none were found during activity area surveys; however aquatic macroinvertebrates are widespread across their range.

The decommissioning of the road along the East Prong Hickey Fork will create stabilization of the stream banks which will prevent further off site movement of soil into the stream. This stabilization will allow for aquatic populations to re-establish themselves over time. Our recent monitoring of natural re-colonization of Swannanoa Creek in McDowell County (following a toxic soybean oil spill) showed that aquatic invertebrate communities reach or exceed pre-damage conditions in less than 18 months. This same monitoring effort showed that once invertebrate populations respond, fish (rainbow trout in this case) also reach or exceed pre-damage conditions during this time. Similar results were found during the monitoring of Roaring Creek in Avery County following severe winter flooding in 1998. The key factor appears to be that the stream channel must be restored (either naturally as in the case of Swannanoa Creek, or manually as in the case of Roaring Creek) to resemble its original condition fairly quickly after the damage has been done, and that upstream and tributary sources of fish and invertebrates must be present to move into affected reaches during high flows and spawning seasons.

It appears that some rehabilitation has occurred within the Hickey Fork area on its own. Data collected since the occurrence of the second series of floods found a flourishing population of young of the year, or juvenile, rainbow trout. It is important to note that even though two major storm events came through the area following the Hickey Fork stream restoration project of 2000, most of the stream structures put into place during restoration remained in tact and functioning. These structures were further damaged by the tropical storms of September 2004. The “cleaning” and flushing of sediments from substrates has likely attributed to reestablishment of a rainbow trout population. Clean substrates create essential trout spawning habitat.

Based on the two local case studies, similar case studies presented in scientific literature, and the current population data for East Prong Hickey Fork, there is no reason to believe that aquatic populations will not return to pre-flood conditions once this project is implemented.

Even though predicted effects of the proposed project on aquatic habitat and populations are positive, the need for strict erosion control and sediment transport control during project implementation remains essential. East Prong Hickey Fork still has the capacity to transport these materials and the lack of erosion and sediment transport control during project implementation could affect local and downstream aquatic habitat and population quality and quantity. Therefore, the project design features listed in Section 2.3 are needed for the prevention of further deterioration of habitat and the protection of species within the project area.

### **3.2.4 Environmental Effects of Alternative C on Water Quality**

Alternative C involves the rebuilding of the existing road, all within the existing corridor with the exception of a 1040 foot section. This section will be removed from the flood plain and moved upslope. The old section will be decommissioned where needed, however most of the old road bed is now a new side channel of East Prong Hickey Fork. This will be beneficial to leave

the side channel within the stream, due to the use of these types of habitats as nurseries for juvenile fish and other aquatic organisms. Moving this section of road outside of the floodplain decreases the risk of future problems such as flooding and landslides.

The rebuilding of the road along the East Prong Hickey Fork will create stabilization of the stream banks which will prevent further off site movement of soil into the stream. This stabilization will allow for aquatic populations to re-establish themselves over time. Riparian vegetation will also re-establish providing benefits to aquatic life within the stream (i.e. cover and nutrient input).

Fill material will be used during the implementation of this action alternative. A substantial amount of the material will be large rocks and boulders which will repair lost slopes within the road bed area. Rock vanes will be placed within the stream which will prevent slope failures from occurring again. These vanes are designed so that they provide habitat for aquatic organisms while protecting stream banks by forcing the high energy flow of water out into the center of the stream channel.

For more discussion on the impacts of catastrophic events within watersheds see effects to water quality for Alternative B

### **3.3 Recreational Use of the Project Area**

#### **3.3.1 Existing Conditions (Recreational Use)**

##### **Pre-flood Conditions**

The majority of the project area is located in or adjacent to Management Area (MA) 2C which emphasizes motorized recreational opportunities. Prior to the flood, this area was used for motorized recreational activities such as driving for pleasure and sightseeing. In addition, motorized travel was used to access traditional non-motorized recreational activities such as fishing, hiking, hunting and wildlife viewing.

##### **Post Flood Conditions**

Damage to the road was sustained in eleven locations along the first 3 miles of the Hickey Fork road on Forest Service property during two flood events in July and August of 2001. All motorized recreational activities have stopped because the road has been closed due to soil and debris blocking the road and washouts along the road. In addition, motorized access to traditional non-motorized recreational activities has also been stopped. The project area can be used for non-motorized recreational activities such as fishing, hiking, hunting, and wildlife viewing; however, all of these activities must be accessed by foot travel only. Foot travel down the Hickey Fork road will require navigating around large debris piles deposited in the road as a result of the flood and walking along narrow strips of remaining roadbed.

The flood washed away the footbridge across East Prong Hickey Fork Creek on the Hickey Fork Trail; therefore, the only access to the Hickey Fork Trail is down a steep bank and across the

stream on foot. This trail serves as access to other trails in the area including the Pounding Mill Trail and the Appalachian Trail. Overall, recreation use in the area has decreased as a result of the flood damage and the road being closed.

### **3.3.2 Environmental Effects of Alternative A on Recreational Use**

Under Alternative A, recreation opportunities would be very similar to post flood conditions discussed above. Opportunities for successful fishing may decrease with degraded water quality.

Since administrative access to this road would remain closed; there would be no access to existing grass/forb openings; therefore, maintenance of these openings would stop and these sites would revert overtime to a forested condition. No motorized access would severely limit the ability to create new early successional habitat through forest management. As a result, opportunities for viewing songbirds and other wildlife dependant on early successional and grass/forb habitat may decrease over time as these habitats decrease. Successful hunting of game species such as turkey and grouse that utilize these habitats may decrease.

There are currently approved plans to replace the footbridge across East Prong Hickey Fork Creek. This would reestablish access to the Hickey Fork Trail, which serves as access to other trails in the area. There are no other known ongoing or planned future activities in the project area that would affect recreational opportunities. The cumulative effects on recreational opportunities in the project area would be increased trail use of the Hickey Fork Trail and other trails in the project area once the bridge has been repaired.

### **3.3.3 Environmental Effects of Alternative B on Recreational Use**

Motorized access to the areas previously served by the Hickey Fork road would be closed to both public and administrative traffic. This would include parts of MA 2C, which emphasizes motorized recreational opportunities. This alternative would eliminate all motorized recreation from the area.

Additional parking would be provided by the new trailhead at end of Hickey Fork road. However, parking at the Whiteoak trailhead would be eliminated. Converting the road to a trail would create additional hiking opportunities. Closing the road to motorized traffic would create additional opportunities for backcountry and primitive recreation experiences.

Closing this road to administrative access would not provide access to grass/forb openings; therefore, maintenance of these openings would stop and these sites would revert overtime to a forested condition. Ending motorized access would severely limit the ability to create new early successional habitat through forest management. As a result, opportunities for viewing songbirds and other wildlife dependant on early successional and grass/forb habitat may decrease over time as these habitats decrease. Successful hunting of game species such as turkey and grouse that utilize these habitats may decrease.

There are currently approved plans to replace the footbridge across East Prong Hickey Fork Creek. Implementation is expected in 2006. This would reestablish access to the Hickey Fork Trail, which serves as access to other trails in the area. The cumulative effects of this proposal with the trail bridge replacement would increase the dispersed recreational opportunities in the project area.

### **3.3.4 Environmental Effects of Alternative C on Recreational Use**

With implementation of Alternative C, recreation opportunities would be restored to pre-flood conditions discussed above. Including, the reestablishment of motorized recreation opportunities including driving for pleasure and sightseeing as directed in the Forest Plan for MA 2C. The restored Hickey Fork road would serve as motorized access to non-motorized recreation such as fishing, hiking, hunting and wildlife viewing.

There are currently approved plans to replace the footbridge across East Prong Hickey Fork Creek. This would reestablish access to the Hickey Fork Trail, which serves as access to other trails in the area. The open status of the road would preclude new opportunities for primitive and backcountry recreation opportunities in the project area at this time.

The cumulative effects of this proposal with the trail bridge replacement would increase the dispersed recreational opportunities in the project area.

## **3.4 Roaded Access into the Project Area**

### **3.4.1 Existing Conditions (Roaded Access)**

#### **Pre-flood Conditions**

There were about 6.2 miles of open Forest Service roads in the project area, which includes the Hickey Fork drainage and a portion of the Whiteoak drainage. The open roads included Forest Service Roads (FSR) 465, Hickey Fork road; FSR 466, Big Rocky road; and FSR 42, Camp Creek Bald road. The Big Rocky road extension, FSR 466A, which is about 2.5 miles long is the only closed road located within the boundaries of the project area. All roads within the project area are needed for resource management and/or public access to Forest Service lands. Maps of the project area including the roads are located in Appendix A.

The majority of the proposed activity area along Hickey Fork road is located in or adjacent to Management Area (MA) 2C which promotes open roads through a scenic forest as the desired future condition. Prior to the flood, the Hickey Fork road was managed as open to both public and administrative motorized traffic.

Approximately 0.9 miles of the Hickey Fork road above the intersection of Little Prong Creek is a rough 4-wheel drive road unaffected by the storm damage. Much of this section of road is in MA 3B; however, it does provide access into MAs 5 and 14. The Big Rocky road is 0.6 miles of

open road located within MA 4D. FSR 466A is a gated, closed extension of FSR 466 and provides no motorized public access. FSR 42 is an open public road in Tennessee adjacent to Paint Creek, only 0.9 miles of this road are within the Pisgah National Forest in North Carolina. The status of these roads is not being considered as part of this decision.

**Table 3-2: Inventory of All Roads in the Hickey Fork Analysis Area**

Road #	Road Name	Length (mi)	Surfacing	Status
465	Hickey Fork	4.7	Gravel	Open
466	Big Rocky	0.6	Gravel	Open
466A	Big Rocky Extension	2.5	Gravel	Closed
42	Camp Creek Bald	0.9	Gravel	Open
Total Open Roads		6.2		
Total Closed Roads		2.5		
Total Roads		8.7		

### **Post Flood Conditions**

All motorized traffic into the part of the project area accessed by the Hickey Fork road, including the Big Rocky road and the Big Rocky extension has been stopped because the road has been closed due to soil and debris blocking the road. The public is unable to use the Hickey Fork road for motorized recreational activities and as access to traditional non-motorized recreational activities. Camp Creek Bald road in the very northwest corner of the project area was not affected by the flooding and remains open.

There is currently no administrative motorized access to the area for forest and wildlife management, stream surveys, monitoring peregrine falcon nesting sites, law enforcement, rescue, or fire protection.

### **3.4.2 Environmental Effects of Alternative A on Roded Access**

Under Alternative A, roded access to the project area along Hickey Fork road would remain the same as post flood conditions discussed above. The direct and indirect effects of this alternative would be the closure of the Hickey Fork road, which serves as access to the Big Rocky road and the Big Rocky extension. This would result in the closure of 5.3 miles of forest roads that were open prior to the 2001 floods. There are no other known ongoing or planned future activities in the project area that would affect roded access; therefore, there are no cumulative effects on roded access into the project area.

### **3.4.3 Environmental Effects of Alternative B on Roded Access**

Motorized access to the areas previously served by the Hickey Fork road would be closed to both public and administrative traffic. This would include parts of MA 2C, which emphasizes roads

that are generally open. This alternative would eliminate all motorized access to the area along the Hickey Fork road.

There would be no administrative motorized access to the area for forest and wildlife management, stream surveys, monitoring peregrine falcon nesting sites, law enforcement, rescue, or fire protection. The direct and indirect effects of this alternative would be the closure of the Hickey Fork road, which serves as access to the Big Rocky road and the Big Rocky extension. This would result in the closure of 5.3 miles of forest roads that were open prior to the 2001 floods. There are no other known ongoing or planned future activities in the project area that would affect roaded access; therefore, there are no cumulative effects on roaded access into the project area.

#### **3.4.4 Environmental Effects of Alternative C on Roaded Access**

With implementation of Alternative C, roaded access to the project area along Hickey Fork road would be restored to pre-flood conditions discussed above. Restoration would provide for managing the Hickey Fork road as open to both public and administrative motorized traffic as directed in the Forest Plan for MA 2C. The restored Hickey Fork road would serve as motorized access to recreational opportunities, administrative management including forest and wildlife management, and emergency services. Under this alternative there would be no change in the pre-flood Forest Service road system; therefore, there would be no cumulative effects.

### **3.5 Impacts to Wildlife Habitat**

#### **3.5.1 Existing Conditions (Wildlife Habitat)**

There are approximately 3,941 acres in the Hickey Fork project area. There are currently zero acres of early successional habitat (0-10 year old stands) located in the project area (the Hickey Fork drainage and part of the White Oak drainage). There are 197 acres currently being managed under group selection management. The project area has 7 acres of grass/forb habitat that is currently being maintained. There are 1535 acres of late successional habitat (80+ year old stands) located in the project area. A map showing the location of these areas under current forest and wildlife management is located in Appendix A.

#### **3.5.2 Environmental Effects of Alternative A on Wildlife Habitat**

The closure of the Hickey Fork road under Alternative A would eliminate the administrative access to maintain the existing grass/forb habitat located in the project area. In the long term, without continued maintenance, these grass/forb areas would revert back to a forested condition. This would result in a net loss of 7 acres of grass/forb habitat in the project area. In addition, there would be no opportunities to create new grass/forb habitat without motorized access to build and maintain these wildlife openings. There is a Forest Plan standard (p. III-23) to provide

a minimum of 0.5% permanent grass/forb openings in Management Areas 1-5 that would not be met.

The closure of the Hickey Fork road under this alternative would eliminate the administrative access to conduct most forest management activities. The investments made in the area being managed under group selection management, which call for re-entering the area every 10-15 years, would be lost with no roaded access to the area. The ability to create new early successional habitat would be very limited with no roaded access into the project area.

Theoretically, new early successional habitat could be created with helicopter logging; however, this method of harvest is very expensive and unlikely to be feasible in the project area. Early successional habitat could result from mortality of existing standing from an insect or disease infestation or natural disasters such as wind or ice storms followed by natural regeneration of those stands. The Forest Plan has a standard of a minimum requirement of 5% early successional habitat in Management Area 3B that would not be met under Alternative A (p. III-31). As stands age they will continue to grown into late successional habitat; therefore, late successional habitat would increase over time in Alternative A.

There are no other known ongoing or planned future activities in the project area that would affect wildlife habitat; therefore, there are no cumulative effects on wildlife habitat in the project area.

### **3.5.3 Environmental Effects of Alternative B on Wildlife Habitat**

The effects on wildlife habitat with Alternative B would be the same as those discussed for Alternative A.

### **3.5.4 Environmental Effects of Alternative C on Wildlife Habitat**

Restoring the Hickey Fork road to its pre-flood condition, would allow for the continued maintenance of the existing 7 acres of grass/forb habitat in the project area. In addition, the access would provide for construction and maintenance of new grass/forb openings in the future if desired. There would be no net loss of grass/forb habitat in the project area.

The ability to create new early successional habitat would exist with continued roaded access into the project area. Early successional habitat could result from mortality of existing standing from an insect or disease infestation or natural disasters such as wind or ice storms followed by natural regeneration of those stands.

The 197 acres currently under group selection management would continue to be managed under that regime. New early successional habitat of approximately 40 acres is expected to be created during the next entry period. As stands age they will continue to grown into late successional habitat; therefore, late successional habitat would increase over time in Alternative C.

There are no other known ongoing or planned future activities in the project area that would affect wildlife habitat; therefore, there are no additional cumulative effects on wildlife habitat in the project area.

## **3.6 Health and Safety**

### **3.6.1 Existing Conditions (Health and Safety)**

#### **Pre-flood Conditions**

The Hickey Fork road provided safe access to the area for sightseers, hikers, fishermen, and hunters. There was vehicular access for emergency crews for any needed rescue efforts and for fire control.

#### **Post Flood Conditions**

The flood resulted in the loss of vehicular access to the Hickey Fork area. Additional time would be required to rescue hikers or hunters in the area and for fire control. Those walking along the Hickey Fork road face unsafe conditions including the need to navigate debris piles, extremely narrow sections of road, steep drop offs along the edge of the road, and blown out culverts.

### **3.6.2 Environmental Effects of Alternative A on Health and Safety**

In its current condition, the Hickey Fork road poses a safety hazard for those trying to access the area using this road. See the description under post-flood conditions for additional details on the unsafe conditions.

### **3.6.3 Environmental Effects of Alternative B on Health and Safety**

The selection of Alternative B would improve public safety by removing the hazards associated with the soil and debris deposited as a result of the floods. Alternative B would address the issues of narrow road width, steep drop offs, and blown out culverts. Safe foot travel would be restored to the Hickey Fork Road. However, there would be no vehicular access for emergency crews for rescue and fire control.

### **3.6.4 Environmental Effects of Alternative C on Health and Safety**

The selection of Alternative C would improve public safety as described in Alternative B. In addition, this alternative would restore vehicular access to the area and that would improve response times for emergency crew for rescue activities and fire control.

## **3.7 Economic Considerations**

### **3.7.1 Existing Conditions (Economic Considerations)**

The current expenditures for the Hickey Fork road project include initial stabilization work, cleaning culverts by hand as well as salary and documentation costs to assess the damage resulting from the floods, to do an environmental analysis on the various alternatives for action, and to develop plans for the action alternatives. The expenditures to date on this project are estimated at \$30,000.

### **3.7.2 Economic Considerations of Alternative A**

There would be no additional cost for implementing Alternative A, the no action alternative.

### **3.7.3 Economic Considerations of Alternative B**

The cost for implementing Alternative B, the alternative to stabilize and close the Hickey Fork road, is estimated to be approximately \$835,000.

### **3.7.4 Economic Considerations of Alternative C**

The cost for implementing Alternative C, the alternative to repair and restore the Hickey Fork road including design and engineering costs, is estimated to be approximately \$1,100,000.

## 4 PREPARERS AND PUBLIC INVOLVEMENT

### Core ID Team Members

Name	Title	Project Role
Karen Compton	Planner	Team Leader, Documentation
David Danley	Botanist	Botanical Resources
Sandy Burnet	Wildlife Biologist	Wildlife Resources
Lorie Stroup	Fisheries Biologist	Aquatic Resources
Bob Noel	Archeologist	Heritage Resources

### Other Forest Service Personnel Providing Input

Name	Title
Paul Bradley	District Ranger
Sheryl Bryan	Forest Fisheries Biologist
Richard Burns	Forest Hydrologist (retired)
Tim Chesley	Engineer
Brady Dodd	Forest Hydrologist
Lynn Hicks	Forest Engineer
Barry Jones	Engineer
Dan Manning	Forest Soil Scientist
David McFee	Operations Assistant
Linda Randolph	Silviculturalist
Arnold Reese	Forestry Technician

### State and Federal Agencies Providing Input

Affiliation	Name
North Carolina Department of Environment and Natural Resources-Division of Land Quality	Mike Goodson
North Carolina Department of Environment and Natural Resources-Division of Water Quality	Kevin Barnett
North Carolina Wildlife Resources Commission	Owen Anderson Shannon Deaton David McHenry
United States Army Corps of Engineers	Steve Chapin Amanda Jones Scott McLendon
United States Department of Interior Fish and Wildlife Service	Brian Cole

### Other Groups, Organizations, and Individuals Providing Input

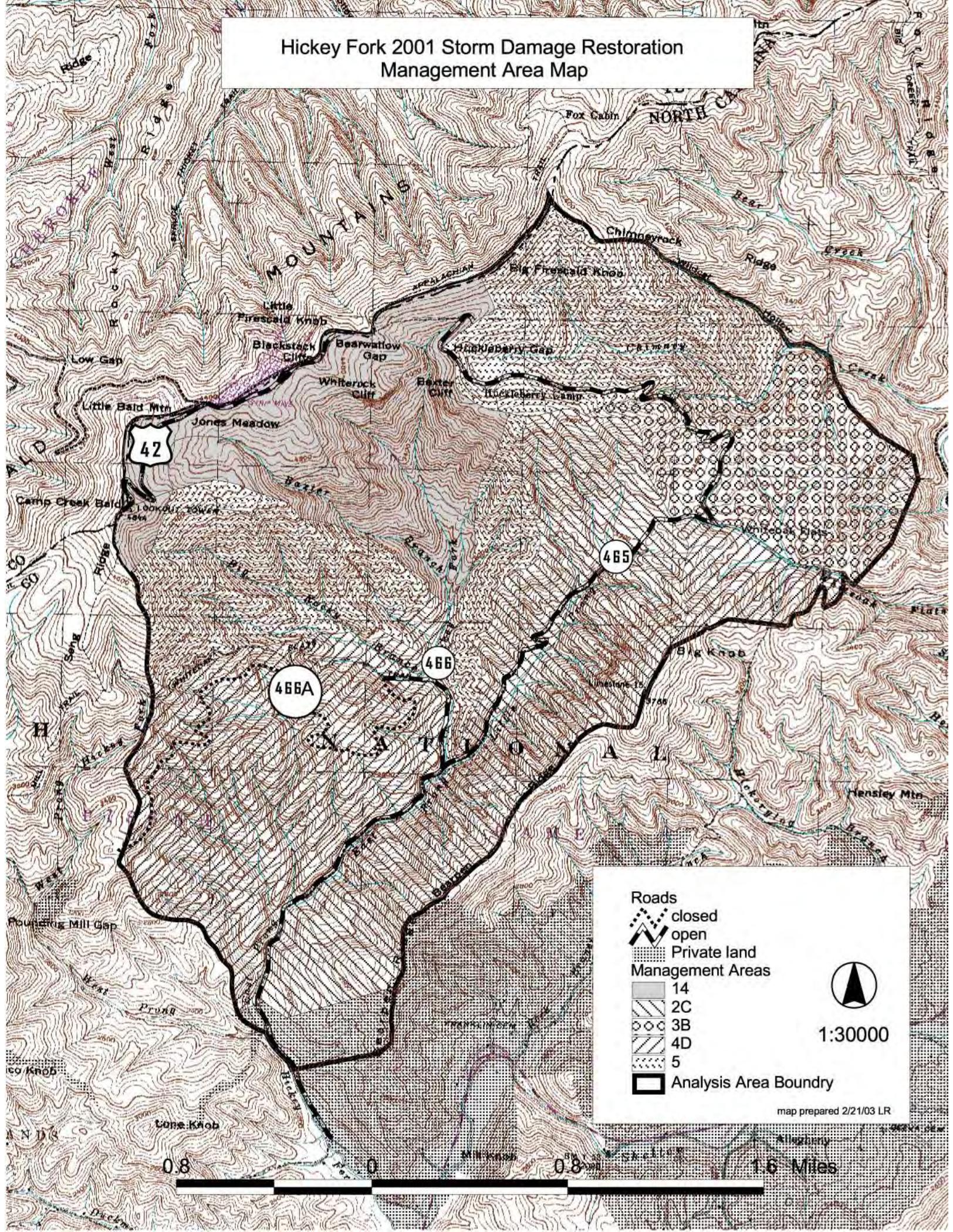
Affiliation	Name
Laurel Volunteer Fire Department	Maurice McAllister
North Carolina Bear Hunters Association	Jim Noles
Southern Appalachian Biodiversity Project	Marty Bergoffen Emily Radecki Rodney Webb
Southern Appalachian Multiple-Use Council	Steve Henson
Western North Carolina Alliance	Bob Gale
Wildlands CPR	Marnie Criley
WildLaw	Stephen H. Novak
	Sherman Bamford
	Richard Burns
	Bob Caldwell
	Michelle Crane
	Verlin W. Enloe
	Kenneth Gibson
	Mary and Rob Kelly
	Ceth Land
	Max Shelton
	Ed Stavish
	Ed Stein
	Bill West
	Brenda S. Yusko

**APPENDIX A**

**Hickey Fork Storm Damage Restoration**

**Management Area Map  
Forest and Wildlife Management Map**

# Hickey Fork 2001 Storm Damage Restoration Management Area Map



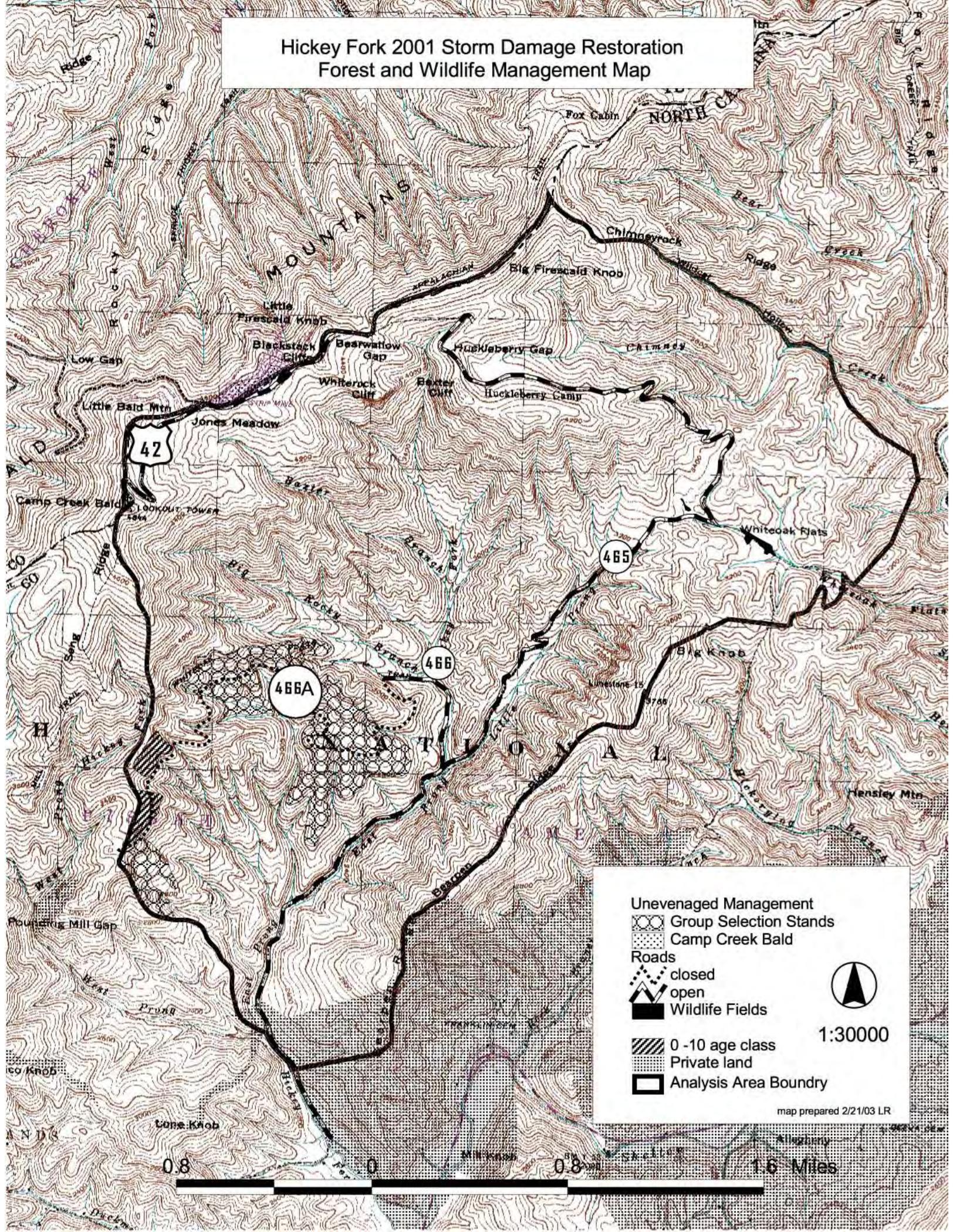
- Roads**
- closed
  - open
- Private land**
- Management Areas**
- 14
  - 2C
  - 3B
  - 4D
  - 5
- Analysis Area Boundry**

1:30000

map prepared 2/21/03 LR

0.8 0 0.8 1.6 Miles

# Hickey Fork 2001 Storm Damage Restoration Forest and Wildlife Management Map



Unevenaged Management

Group Selection Stands

Camp Creek Bald

Roads

closed

open

Wildlife Fields

0-10 age class

Private land

Analysis Area Boundry



1:30000

map prepared 2/21/03 LR

0.8

0

0.8

1.6 Miles

## **APPENDIX B**

### **Hickey Fork Storm Damage Restoration**

#### **Biological Evaluation**

# **HICKEY FORK PROJECT**

Madison County, North Carolina  
Appalachian Ranger District

## **Introduction**

The proposed activities and possible extent of those activities are listed in the environmental assessment (EA). The potential effects of this proposal on Threatened, Endangered, and sensitive (TES) species are evaluated. Potential direct and indirect impacts to TES species were analyzed in the areas where ground disturbance is proposed. This area of disturbance is called the “activity area”. This BE draws its conclusions from the wildlife, botanical, and aquatics resource reports. Conclusions and opinions reached within this BE are drawn from these reports. These reports are an integral part of this BE and should be consulted where further detail is needed.

The activity area is on the Appalachian Ranger District, Pisgah National Forest, Madison County, North Carolina. Each discipline (wildlife, botanical, and aquatic) may have a defined biological analysis area (AA) that is germane to that discipline.

## **Project Location & Description**

The wildlife biological AA encompasses the area where road construction will directly affect is referred to as the wildlife activity area. The project in its entirety falls within the Appalachian Ranger District, Madison County, North Carolina.

The aquatic biological AA is within Land and Resources Management Plan (LRMP) watershed number 38, which is the French Broad River watershed. The aquatic project area includes the East Prong of Hickey Fork Creek and Shelton Laurel Creek. The activity area is located approximately 500 feet northeast of the USFS property line along Hickey Fork Road and continues northeast along the road for approximately 2.9 miles. Hickey Fork Road runs along the East Prong of Hickey Fork Creek. The section that is adjacent to and involved in project activities is designated as the “aquatic biological activity area” of this project. The analysis area includes the aquatic biological activity area downstream to the confluence of Shelton Laurel Creek (on private properties).

The area where road construction will directly affect plant species is referred to as the botanical activity area. The botanical analysis area is compartment 409 of the Appalachian Ranger District in Madison County, North Carolina.

## **Proposed Action**

This document reports the findings of a biological evaluation of the proposed Hickey Fork Storm Damage Restoration Project on the Appalachian Ranger District, Pisgah National Forest, Madison County, North Carolina. The action alternatives of this project include the stabilization and closure of Hickey Fork Road (Alternative B) or the repair and restoration of Hickey Fork Road and stream bank stabilization (Alternative C). This repair is needed due to several major storm events that have caused flooding and landslides within the Hickey Fork area. The purpose of the proposed actions is to protect resource values and public safety; meet Forest Plan standards for access, forest and wildlife management, recreational opportunities and reduce the threat to property.

## **Existing Condition**

### **Wildlife**

Wildlife surveys of the areas that would be impacted by implementation of Alternative C found that the corridor of this stream channel was severely eroded. The bordering habitat consisted of a rock/boulder complex, dog hobble and rhododendron dominated shrub layer below mature poplar canopy. There is a Chestnut oak dominated forest community immediately above the site of the main road relocation. Generally, a highly disturbed site from the past flood events and poor plant diversity caused the determination of poor wildlife habitat to be made.

### **Aquatics**

The aquatic project area includes the East Prong of Hickey Fork Creek and Shelton Laurel Creek. The East Prong of Hickey Fork Creek is considered by the NC Department of Natural Resources Division of Water Quality as a class “C” water and Shelton Laurel Creek is designated class “C Tr” waters. The “C” classification indicates waters suitable for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. The “Tr” classification denotes waters suitable for natural trout propagation and maintenance of stocked trout.

### **Botanical**

The botanical field surveys found that the area is dominated by Acidic Cove Forest and Montane Alluvial Forest natural communities and roadside early serial (anthropogenic habitat). Other minor amounts “inclusions” of Chestnut Oak Forest were found on upper slopes. Common constituent plant species of these communities were encountered. The Acidic Cove Forests community are common in the region and the Montane Alluvial Forest is rather less common, but not rare, within the region. These communities are described in depth in by Shafale and Weakly (see references).

## **Method of Evaluation and Surveys**

Potentially affected TES (**2002**) species and habitat were identified from the following sources:

- 1) Information on TES species and their habitat on the Nantahala and Pisgah National Forests were obtained from the North Carolina Wildlife Resources Commission (NCWRC), U.S. Fish and Wildlife Service (USFWS), and North Carolina Natural Heritage Program (NCNHP) occurrence records.
- 2) Surveys completed for this analysis, past surveys, and analysis for projects within or near the analysis areas.
- 3) Consulting with individuals both in the public and private sector who are knowledgeable of the area and its biota.
- 4) Results from the Species Specific Habitat Analysis of Listed Species for Nantahala and Pisgah Nation Forest of 2004

This analysis has been prepared based on the best available information at the present time.

## **Project Surveys**

The following resource specialists surveyed the activity and/or analysis areas to observe existing resource condition, identify rare species and suitable habitat, and evaluate potential impacts on biological resources for the proposed project:

### **Wildlife**

Sandy Burnet, USFS Wildlife Biologist, surveyed the project area on August 26, 1999. A reevaluation of data and documentation occurred in July of 2002. Surveys of route for proposed Alternative C were carried out in 2004. The documentation and surveys were updated and revised on January 3, 2006.

### **Botanical**

David M. Danley, USFS Botanist surveyed the Hickey Fork project area on August 28, 1999. A reevaluation of data and documentation was conducted in January, 2003. Surveys were conducted in May of 2004 to look for presence of botanical TES, specifically *Hydrotheria venosa*, in the project area. The botanical analysis was revisited again on January 3, 2006 and proper changes was made to the document.

### **Fisheries**

Sheryl A. Bryan, USFS Fisheries Biologist initially surveyed the project area on July 21 and August 19, of 1999. Lorie L. Stroup, USFS Fisheries Biologist also surveyed the area on November 22, 2002. USFS technicians, Matt Eldridge and Patrick Scott conducted habitat surveys in June of 2003. The USFS along with the NC Wildlife Resources Commission conducted trout monitoring and inventories during the summer of 2003 within the East Prong of Hickey Fork.

These people used information from their surveys, data available from other resource agencies and organizations, primary and secondary scientific literature, and consultations with knowledgeable individuals from the public and private sectors.

**Species Evaluation**

Species evaluated further may be found in Tables 1 thru 3. Species not evaluated further are listed in Attachment 1, along with the reason for elimination from further consideration.

**Wildlife**

There are no known threatened (T) & endangered (E) species or habitat within this county; however, there are five sensitive species within the county as listed in Table 1. There are no additional known 2002 Regional Forester’s Sensitive (S.) species or their habitat within Madison County. Activity area is defined as the immediate surrounding area of the Alternative C, potential earth disturbing actions.

**Table 1. Potential TES Wildlife Species within Madison County**

Species	Type	Habitat	Occurrence
<b>Federally Threatened or Endangered wildlife species (T &amp;E)</b>			
<i>NONE</i>			
<b>2002 Region 8 Regional Forester’s Sensitive wildlife species (S)</b>			
<i>Ventridens coelaxis</i> , Bidentate dome	Gastropod	Leaf litter, usually high elev. forests	Known to occur outside activity area
<i>Paravitrea ternaria</i> , Sculpted supercoil	Gastropod	Rich, Acidic cove, N. red oak, and Montane oak	Known to occur within the county
<i>Helicodiscus triodes</i> , Talus coil	Gastropod	Rich cove	Known to occur within the county
<i>Paravitrea varidens</i> , Roan supercoil	Gastropod	Acidic and rich cove, often with <i>Fraxinus americana</i>	Known to occur within the county
<i>Paravitrea placentula</i> , Glossy supercoil	Gastropod	Wide variety of forest communities, often with <i>Betula</i> and <i>Tsuga</i> species	Known to occur within the county

## Botanical

Surveys in May of 2004 found no evidence that *Hydrotheria venosa* still occurs within the analysis area. It is believed that the extreme force of the water from the storms possibly combined with large sediment deposits associated with the storms caused the extirpation of the species from the analysis area.

**Table 2. Potential TES plant species in the proposed botanical analysis area.**

SPECIES	TYPE	NATURAL COMMUNITY OR HABITAT	OCCURRENCE EFFECT
<b>Federally Threatened or Endangered plant species (T &amp;E)</b>			
None Known	N/A	N/A	N/A
<b>2002 Region 8 Regional Forester's Sensitive plant species (S)</b>			
<i>Carex ruthii</i>	Vascular plant	Forested seeps	Could occur in analysis area, not known to occur in analysis or activity area. No effect.
<i>Hydrotheria venosa</i>	Lichen	Aquatic Lichen on rock within fast moving, shallow water.	Not known within analysis or activity area. Proposal will not effect <i>Hydrotheria venosa</i>
<i>Plagiochila austinii</i>	Liverwort	Acidic Cove Forest	Could occur in analysis area, not known to occur in analysis or activity area. No effect.

## Aquatic

The spottin chub, (*Cyprinella monacha*), is the only listed aquatic T & E species for Madison County. Extensive surveys conducted by the US Fish and Wildlife Service, US Forest Service, NC Wildlife Resources Commission, the NC Department of Transportation and other private environmental groups and organizations have studied the distribution of fish within Madison County particularly spotfin chub. The last record of this species occurring in Madison County is dated back to 1888 and was observed in the French Broad River (outside of the analysis area). Therefore, *Cyprinella monacha* will not be analyzed any further for this project.

Sensitive species, wounded darter (*Etheostoma vulneratum*), olive darter (*Percina squamata*) and the French Broad River crayfish (*Cambarrus reburus*) are listed for Madison County. *Etheostoma vulneratum* was last documented in Madison County in 1870 in the French Broad River (outside of the analysis area). Due to the lack of present records and the historical records being outside of the analysis area, *Etheostoma vulneratum* will not be included any further in this analysis.

*Percina squamata* was last documented in the French Broad River in 1987 (outside the analysis area). Recent surveys were conducted by DWQ at an ambient monitoring site

on Shelton Laurel Creek within the aquatic analysis area of the Hickey Fork Project. The surveys from this site and project specific surveys within East Prong Hickey Fork indicate no presence of *Percina squamata* within Shelton Laurel Creek. Therefore, this species will no longer be included in this analysis.

*Cambarus reburus* was last documented within the French Broad River Basin in 1981. Recent surveys indicate that this species is no longer present within the Shelton Laurel Creek sub-drainage of the French Broad River. Since this crayfish was not found during project area surveys nor by other cooperating agency surveys, *Cambarus reburus* will not be included any further in this analysis.

**Table 3. Potential Aquatic Threatened, Endangered, and Sensitive species evaluated for the proposed Hickey Fork Project.**

Species	Type	Brief Habitat Description	Occurrence
<b>Federally Threatened and Endangered species</b>			
None			
<b>2002 Regional Forester’s Sensitive Species</b>			
None			

**Direct, Indirect, and Cumulative Effects to TES Species and Habitat**

**Wildlife**

Survey results for snail and salamander species in 2004 resulted in only common species being found. Should any Sensitive snail species occur outside the activity area, they will benefit with potential habitat expansion by Alternatives B and C by the stabilization of the soil and vegetation surrounding Hickey Fork creek.

There will be no direct, indirect, or cumulative effects to any T&E or S wildlife species by any alternative proposed.

**Aquatic**

There will be no direct, indirect, or cumulative effects on any aquatic TES species since none occur within the project area based on analysis and project area surveys that were conducted by the USFS, NCWRC, NCHP and DWQ.

**Botanical**

Because of the relative intensity of the field survey, not finding any plant TES species and the relatively low potential for plant TES species to occur in the communities present in the activity area, it is not likely any TES exist in the proposed activity area. Although general habitat for other (Table 2) plant TES species does occur within in the activity area, there are no known records of the occurrence of these species within the proposed activity area; nor where they found during the survey. It is concluded that this proposal will have no effect on these species or any TES species. Sense there are no

plant TES species known to occur, or are likely to occur, there is no mitigation recommended. This proposal has no known effects: direct, indirect or cumulative on any TES plant species.

### **Mitigation Measures**

#### **Wildlife, Aquatic and Botanical**

No mitigation measures are required for this project.

#### **Determination of Effect**

This proposal will have no direct, indirect or cumulative effect on any wildlife, aquatic or plant Threatened, Endangered or proposed federally listed species or Sensitive species. Consultation with the USDI., US. Fish & Wildlife Service is not required.

### **List of Preparers**

Prepared by: /s/ Lorie L. Stroup                      January 3, 2006  
Lorie L Stroup – lstroup@fs.fed.us  
Lorie Stroup, Aquatic Resources Analysis and Biological Evaluation  
USFS Fisheries Biologist, Pisgah National Forest

Dave Danley, Botanical Analysis  
USFS Botanist, Pisgah National Forest

Sandy Burnet, Wildlife Analysis  
USFS Wildlife Biologist, Pisgah National Forest

## References and Data Sources

### Wildlife

- Glassburg, J. 1993. . Oxford Univ. Press, New York, NY. 160pp.
- Hamel, P.B. 1992. Land Manager's Guide to the Birds of the South. The Nature Conservancy, Southeastern Region, Chapel Hill, NC. 437pp.
- Hunter, W.C., D.A. Buehler, R.A. Canterbury, J.L. Confer and P.B. Hamel. 2001. Conservation of disturbance-dependent birds in eastern North America. Wildl. Soc. Bull. 29(2):440-455.
- Knopf, Alfred A., 1988. The Audubon Society Field Guide to North America Reptiles and Amphibians. Chanticleer Press, Inc. New York. 743 pp.
- LeGrand, H.E.Jr., S.P. Hall and J.T. Finnegan. 2004. NATURAL HERITAGE PROGRAM LIST OF THE RARE ANIMAL SPECIES OF NORTH CAROLINA. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment and Natural Resources. 90pp.
- Menzel, M.A., W.M. Ford, J. Laerm and D. Krishon. 1999. Forest to wildlife opening: habitat gradient analysis among small mammals in the Southern Appalachians. Forest Ecol. and Mngt. 114(2-3):227-232.
- Robbins, C.S. D.K. Dawson, B.A. Dowell. 1989. Habitat area requirements of breeding forest birds of the middle Atlantic states. Wildlife Monographs 103: 1-34.
- U.S. Fish and Wildlife Service. 2005. Federal Endangered and Threatened Species of North Carolina. Asheville, NC.
- U.S. Forest Service. 1994. Land and Resource Management Plan for the Pisgah and Nantahala National Forests. National Forests in North Carolina, Asheville, NC.
- U.S. Forest Service. 2005. Management Indicator Species Habitat and Population Trends report for the Pisgah and Nantahala National Forests. National Forests in North Carolina, Asheville, NC.

### Aquatic

- Berner, L. and R.K. Allen. 1961. Southeastern species of the mayfly subgenus *Serratella* (*Ephemerella*:Ephemerellidae). Florida Entomology 44:149-158.
- Bonner, W.R. 1983a. Survey and classification of state-managed trout streams: District 9. Mountain Fisheries Investigations Federal Aid in Fish Restoration Project F24-S. 313pages.

- Brigham, A.R., W.U. Brigham, and A. Gnilka (editors). 1982. Aquatic insects and oligochaetes of North and South Carolina. Midwest Aquatic enterprises, Mahomet, Illinois. 837 pages.
- Bryan, S.A., J.D. Riley, and D.M Hill. 1999. NFMA Monitoring Report for Aquatic Resources of the Nantahala and Pisgah National Forests, FY98 unpublished).
- Cantrell, Mark. US Fish and Wildlife Service, 160 Zillicoa St., Asheville, NC, 28801.
- Clinton, B.D. and J.M. Vose. 2003. Differences in surface water quality draining four road surface types in the Southern Appalachians. Southern Journal of Applied Forestry. 27: 100-106.
- Dillon, R.T. 1992. Status survey of the knotty elimia, *Goniobasis interruptald.*) North Carolina Wildlife Resources Commission contract No. 92-Snai-01. 20 pages.
- Douglass, J.E. and W.T. Swank. 1972. Streamflow modification through Management of eastern Forests. USDA Forest Service Research Paper SE – 94. 15 pp.
- Etnier, D.A. and W.C. Starnes. 1993. The fishes of Tennessee. The University Of Tennessee Press, Knoxville, Tennessee. 681 pages.
- Georgian, T.J. and J.B. Wallace. 1993. Seasonal production dynamics in a guild Or periphyton-grazing insects in a southern Appalachian stream. Ecology 64:1236-1248.
- Grant, G. 1988. The RAPID technique: a new method for evaluating downstream effects of forest practices on riparian zones. Gen. Tech. Rep. PNW-GTR-220. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station. 36 pages.
- Hillis, R.E. and E.D. Bellis. 1971. Some aspects of the ecology of the hellbender, *Cryptobranchus alleganiensis alleganiensis*, in a Pennsylvania stream. Journal of Herpetology 5(3-4):121-126.
- Hobbs, H.H. Jr. 1989. An illustrated checklist of the American crayfishes Decapoda: Astacidae, Cambaridae, and Parastacidae). Smithsonian Contributions to Zoology Number 480. 236 pp.
- Huryn, A.D. and J.B. Wallace. 1987. The exopterygote insect community of a mountain stream in North Carolina, USA: life histories, production, and functional structure. Aquatic Insects 9:229-251.
- Jenkins, R.E. and N.M. Burkhead. 1994. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland. 1079 pages.

- Kohler, C.C. and W.A. Hubert, editors. 1993. Inland fisheries management in North America. American Fisheries Society, Bethesda, Maryland. 594 pages.
- Lee, D.S., C.R. Gilbert, C.H. Hocutt, R.E. Jenkins, D.E. McAllister, and J.R. Stauffer, Jr. Atlas of North American freshwater fishes. North Carolina Biological Survey, Publication #1980-12. 867 pages.
- McAfee, W.R. 1966. Eastern brook trout. Pages 242-260 *in* Calhoun, A. (editor), Inland fisheries management. California Fish and Game Publication. 546 pages.
- MacDonald, L.H., A.W. Smart, and R.C. Wissmar. 1991. Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. US Environmental Protection Agency, Region 10, Water Division, EPA910/9-91-001. Seattle, WA. 166 pages.
- Meehan, W.R. (editor) 1991. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Special Publication #19, Bethesda, Maryland. 751 pages.
- Menhinick, E.F. 1991. Freshwater fishes of North Carolina. North Carolina Wildlife Resources Commission Publication, Raleigh, North Carolina. 227 pages.
- Merritt, R.W. and K.W. Cummins. 1996. An introduction to the aquatic insects of North America, third edition. Kendall/Hunt Publishing Company, Dubuque, Iowa. 962 pages.
- The Nature Conservancy. 1999. Natural Heritage Conservation Databases. Accessed by USDA Forest Service under Grant no. 97-CCS-230.
- North Carolina Natural Heritage Program. 1997. Biological Conservation Data. Computerized database.
- Pennak, R.W. 1989. Fresh-water invertebrates of the United States: protozoa to mollusca. John Wiley and Sons, New York, New York. 628 pages.
- Raleigh, R.F. 1982. Habitat suitability index models: brook trout. USFWS Biological Services Program Publication FWS/OBS-82/10.24. 42 pages.
- Raleigh, R.F., T. Hickman, R.C. Soloman, and P.C. Nelson. 1984. Habitat suitability information: rainbow trout. USFWS Biological Services Program Publication FWS/OBS-82/10.60. 53 pages.

- Raleigh, R.F., L.D. Zuckerman, and P.C. Nelson. 1986. Habitat suitability index models and instream flow suitability curves: brown trout. USFWS Biological Services Program Publication FWS/OBS-82/10.124. 42 pages.
- Ridout, S. 2002. Unpublished data. Department of Biology, Virginia Commonwealth University. Richmond, Virginia.
- Scientific Council Report on Freshwater Fishes. 1991. A report on the conservation status of North Carolina's freshwater fishes. Annual report prepared in accordance with Article 25 of Chapter 113 of the General Statutes of North Carolina. 17 pages plus appendices.
- Scientific Council Report on Terrestrial and Molluscan Fauna. 1990. A report on the conservation status of North Carolina's freshwater and terrestrial molluscan fauna. Annual report prepared in accordance with Article 25 of Chapter 113 of the General Statutes of North Carolina. 246 pages plus appendices.
- Stone, M.K. and J.B. Wallace. 1998. Long-term recovery of a mountain stream from Clear-cut logging: the effects of forest succession on benthic invertebrate community structure. *Freshwater Biology*. 39: 151-169.
- Swift, L.W. 1985. Forest road design to minimize erosion in the Southern Appalachians. In: Blackmon, B.G., ed. *Proceedings of forestry and water quality: a mid-south symposium*. Monticello, Arkansas: University of Arkansas. 141-151.
- Terwilliger, K. (editor). 1991. *Virginia's endangered species: proceedings of a symposium*. McDonald and Woodward Publishing Company, Blacksburg, Virginia. 672 pages.
- USDA Forest Service, National Forests in North Carolina. 2004. *Management indicator species habitat and population trends – Nantahala and Pisgah National Forests*. 829 pp.
- Waters, T.F. 1995. *Sediment in streams: sources, biological effects, and control*. American Fisheries Society Monograph 7, Bethesda, Maryland. 251 pages.

## **Botanical**

- Anderson, Lewis. *Key to the genera of Mosses of the southeastern United States*. Unpublished, Duke university.

Britton N. L. and Brown A. 1970, *An Illustrated Flora of the United States and Canada*. Dover Publications Inc., New York, New York.

Conard, Henry and Redferan P. 1979. *How to know the Mosses and Liverworts*. Wm. Brown Company, Dubuque, Iowa.

Crum, Howard and Anderson L. 1981, *Mosses of Eastern North America*. Columbia University Press, New York, New York.

Hicks, Marie. 1992. *A guide to the Liverworts of North Carolina*. Duke University Press, Durham, North Carolina.

Radford, Albert E., et. al., 1968. *Manual of the Vascular Flora of the Carolinas*. University of North Carolina Press, Chapel Hill, North Carolina.

Schafale, M. P. and Weakley Alan. 1990. *Classification of the Natural Communities of North Carolina: Third Approximation*. North Carolina Natural Heritage Program, Raleigh, North Carolina.

Straussbaugh P. D. and Core E. L. 1977. *Flora of West Virginia*. Seneca Books Inc., Morgantown, West Virginia

United States Forest Service, National Forests of North Carolina. 1994." List of Proposed, Endangered, Threatened, and Sensitive (PETS) Plants List". National Forests of North Carolina. Unpublished.

Weakley, Alan S. 1993. *Guild to the Flora of the Carolinas and Virginia*, a working draft. Unpublished.

Weakley, Alan S. & Amoroso, Jame. 1995. Natural Heritage Program List of the Rare Plants of North Carolina and North Carolina Watch List. North Carolina Natural Heritage Program, Raleigh, North Carolina.

Wofford, B. Eugene. 1989. *Guild to the Vascular Plants of the Blue Ridge*. University of Georgia Press, Athens, Georgia.

## Attachment 1 Species Lists for Madison County

### Wildlife

#### Madison County Threatened, Endangered, or Regional Forester's Sensitive wildlife species Threatened, Endangered, or Proposed Wildlife Species

Threatened, Endangered, or Proposed Wildlife Species			
None Occur in Madison County			
Sensitive Species (based on January 1, 2002 Regional Forester's list)			
Species	Type	Habitat	Likelihood of Occurrence
<i>Ventridens coelaxis</i> , Bidentate dome	Gastropod	Leaf litter, usually high elev. forests	Negative survey results
<i>Paravitrea ternaria</i> , Sculpted supercoil	Gastropod	Rich, Acidic cove, N. red oak, and Montane oak	Negative survey results
<i>Helicodiscus triodes</i> , Talus coil	Gastropod	Rich cove	Negative survey results
<i>Paravitrea varidens</i> , Roan supercoil	Gastropod	Acidic and rich cove, often with <i>Fraxinus americana</i>	Negative survey results
<i>Paravitrea placentula</i> , Glossy supercoil	Gastropod	Wide variety of forest communities, often with <i>Betula</i> and <i>Tsuga</i> species	Negative survey results

### Aquatics

#### TES species list for aquatic species in Madison County.

Common Name	Scientific Name	Habitat	Likelihood of Occurrence
Threatened, Endangered, or Proposed Species			
spotfin chub	<i>Cyprinella monacha</i>	Sandy rubble and gravel substrates within larger streams and rivers	Does Not Occur (6)
Sensitive Species (based on January 1, 2002 Regional Forester's list)			
wounded darter	<i>Etheostoma vulneratum</i>	Moderate to large rivers	Does Not Occur (6)
olive darter	<i>Percina squamata</i>	Higher gradient upland rivers with boulder and bedrock chutes	Does Not Occur (6)
French broad river crayfish	<i>Cambarus reburus</i>	moderately flowing streams in headwaters	Does Not Occur (6)

#### Evaluation Criteria

1 = Recent survey data within or downstream the aquatic analysis area (<5 yrs old)

2 = Historical survey data within or downstream the aquatic analysis area (>5 yrs old)

3 = Vicinity records (within or downstream the analysis area, not necessarily within project area)

4 = Suitable habitat present, but no vicinity records

5 = No suitable habitat present or vicinity records within analysis area, but species may be present in county

6 = Extirpated species listed for river system

## Botanical

### Madison County TES Plants

Species	Natural Communities, Habitat	Status/Occurrence*
<b>Threatened, Endangered, or Proposed Species</b>		
None Occur in Madison County		
<b>Sensitive Species</b>		
<i>Allium cuthbertii</i>	Low Elevation Granitic Dome	Sensitive/4
<i>Arabis patens</i>	Montane Mafic Cliff, Montane Calcareous Cliff	Sensitive/4
<i>Asplenium x ebenoides</i>	Montane Calcareous Cliff	Sensitive/4
<i>Berberis canadensis</i>	Rich Cove Forest, Glade, mafic rock	Sensitive/4
<i>Buckleya distichophylla</i>	Hemlock Hardwood Forest, Acidic Cove Forest, Montane Acidic Cliff, Mesic Oak-Hickory	Sensitive/3
<i>Carex ruthelii</i>	Forested seeps	Sensitive/3
<i>Cleistes bifaria</i>	Pine-Oak/Heath Forest, Pine-Oak Woodland	Sensitive/3
<i>Euphorbia purpurea</i>	Northern Hardwood Forest, Rich Cove Forest, Mesic oak-hickory	Sensitive/3
<i>Heuchera longiflora</i> var. <i>aceroides</i>	rock outcrops in Rich Cove Forest, mafic rock	Sensitive/4
<i>Hydrothyria venosa</i>	Stream	Sensitive/4
<i>Juglans cinerea</i>	Rich Cove Forest, Mesic Oak-Hickory, Montane Alluvial Forest	Sensitive/4
<i>Penstemon smallii</i>	rock outcrops, woodlands	Sensitive/4
<i>Plagiochila austinii</i>	Moist Montane Acidic Cliff	Sensitive/3
<i>Prenanthes roanensis</i>	Northern Hardwood Forest, Grassy Bald, Meadow, Roadside, High Elevation Red Oak Forest	Sensitive/4
<i>Saxifraga caroliniana</i>	Northern Hardwood Forest, Montane Acidic Cliff, High Elevation Rocky Summit	Sensitive /4
<i>Silene ovata</i>	Rich Cove Forest, Mesic Oak-Hickory, Roadside, mafic rock	Sensitive /4
<i>Thaspium pinnatifidum</i>	Rich Cove Forest, Mesic Oak-Hickory, Roadside, mafic rock	Sensitive /4
<i>Trillium simile</i>	Rich Cove Forest	Sensitive /4

\*1=known to occur within activity area

2=known to occur in AA but not within activity area

3=not known to occur within activity area or AA but may contain (limited) habitat for species

4=not known to occur within AA and no habitat is known to occur within AA.

## **APPENDIX C**

### **Hickey Fork Storm Damage Restoration**

#### **Management Indicator Species Report**

# Management Indicator Species Report ---

## Introduction

An assessment of habitat changes linked to management indicator species (MIS) and habitat components is documented in this report based on the species list that became effective Forest-wide on October 1, 2005. The assessment provides a checkpoint of project level activities, the anticipated change in habitat used by MIS, and the likely contribution to Forest-wide trends.

## Process

The Forest-wide list of MIS was considered as it relates to this project analysis area. Only those MIS that occur or have habitat within the project analysis area and may be affected by any of the alternatives were carried through a site-specific analysis. The documentation below shows which MIS were and were not analyzed along with the reasons.

Consistent with the Forest Plan and its associated FEIS (Volumes I and II), the effects analyses focus on changes to MIS habitat. These project-level effects are then put into context with the Forest-wide trends for populations and habitats.

To process and document the information efficiently, a series of tables are used as follows:

- 1) **Table 1:** This table displays biological communities and associated MIS, and reasons species were, or were not selected for analysis in the project. The source of these tables is Amendment 17 to the Nantahala and Pisgah Land and Resource Management Plan effective October 1, 2005, and associated environmental assessment (EA) and project record.
- 2) **Table 2:** This table displays the habitat components and associated MIS, and reasons species were, or were not selected for analysis in the project.
- 3) **Table 3:** This table displays by MIS the Forest-wide population trend along with the associated biological community or special habitat. The information in this table is taken from the MIS Report for the Nantahala and Pisgah National Forests.
- 4) **Table 4:** This table compares the effects (expressed as changes in habitat) by alternative to the Forest-wide estimates of habitats for each habitat component considered in the project-level analysis. This table explains how the project's effects to habitats affect Forest-wide population cumulative trends for the species considered.

Following these tables is a discussion of the direct, indirect, and cumulative effects for the selected species and habitats.

**Table 1: Biological Communities, associated MIS, and why Species were Chosen or Eliminated from Analysis**

Biological Community	MIS	Analyzed Further/ Evaluation Criteria*
Fir dominated high elevation forests	Fraser fir	No/1
Northern hardwood forests	Ramps	No/1
Carolina hemlock bluff forests	Carolina hemlock	No/1
Rich Cove forests	Ginseng	No/1
Xeric yellow pine forests	Pine warbler	No/1
Reservoirs	Largemouth bass	No/1
Riparian forests	Acadian flycatcher	Yes
Coldwater streams	Wild brook trout, wild brown trout, wild <u>rainbow trout</u> , blacknose dace (lower trophic levels of streams)	Yes
Coolwater streams	Smallmouth bass	No/1
Warmwater streams	Smallmouth bass	No/1

\*1 Biological Community and its represented species do not occur within the activity areas; therefore, this biological community would not be affected by any of the alternatives. Given no effects to the community, the alternatives in this project would not cause changes to forest-wide trends or changes in population trends of species associated with this community.

2 Biological Community and its represented species would be protected in accordance with LRMP standards and guidelines. Populations would not be affected by management activities because the associated habitat would not be entered by the proposed activities, pursuant to forest plan direction; therefore, there would be no change to forest-wide population trends.

**Table 2: Habitat Components Associated MIS and why Species were Chosen or Eliminated from Analysis**

Habitat Components	MIS	Analyzed Further/ Evaluation Criteria*
Old Forest Communities (100+ years old)	Black bear	No/1
Early successional (0-10 years old)	Rufous-sided (eastern) towhee	No/1
Early successional (11-20)	Ruffed grouse	No/1
Soft mast producing species	Ruffed grouse	No/1
Hard mast-producing species (>40 yrs)	Black bear	No/1
Large contiguous areas with low levels of human disturbance	Black bear	No/1
Large contiguous areas of mature deciduous forest	Ovenbird	No/2
Permanent grass/forb openings	White-tailed deer	No/2
Downed woody debris	*Ruffed Grouse	No/1
Snags	Pileated woodpecker	No/2

Coldwater streams	Wild brook trout, wild brown trout, wild <b>rainbow trout</b> , blacknose dace (lower trophic levels of streams)	Yes
Warmwater streams	Smallmouth bass	No, 1
Coolwater streams	Smallmouth bass	No, 1
Reservoirs	Largemouth bass	No, 1

- \*1 Habitat and its represented species do not occur within the project area; therefore, this special habitat would not be affected by any of the alternatives. Given no effects to the habitat, the alternatives in this project would not cause changes to forest-wide trends or changes in population trends of species associated with this habitat.
- 2 Habitat and its represented species would be protected in accordance with LRMP standards and guidelines. Populations would not be affected by management activities; therefore, there would be no change to forest-wide population trends.
- \* Although there are considerable large, woody debris (LWD) within the stream corridor, this is not the habitat utilized by ruffed grouse.

Acadian Flycatcher – This flycatcher has a breeding population within the mountains of Western North Carolina. The preferred habitat is moist, deciduous forests with a moderate understory, most commonly near streams. Nests are built on down-hanging branches of deciduous trees, usually over a stream. The flycatcher forages on flying insects 10-40 feet above the ground. The Breeding Bird Survey (BBS) trend data for this region shows a downward trend in the population. However, the majority of BBS survey routes are along private land on roads. The Region 8 bird surveys completed on the Nantahala and Pisgah National Forests for the past 5+ years, indicate a static population trend for the Acadian Flycatcher.

The trees within the immediate vicinity of the Hickey Fork stream corridor have all been eliminated during past storm events. The section of proposed new road construction has a dense shrub layer of dog hobble. Therefore, there is presently no habitat for the Acadian Flycatcher within the Stream area proposed for re-construction. There may be habitat above this project area where the trees and habitat have not been displaced by storm events. This potential habitat will not be affected by the proposed project, any alternative.

As no trees providing habitat for foraging or nesting will be cut due to the Hickey Fork Road Improvement project, there will be no direct, indirect, or cumulative effects to the Acadian Flycatcher.

Rainbow Trout – Rainbow trout exist within the aquatic activity area, and downstream in the analysis area of the Hickey Fork Project. The activities associated with this project could have negative short-term impacts on the spawning habitat of rainbow trout. However, this project has been designed so that fluctuations in sediment will be minimized by the implementation of best management practices (BMP) and forest practice guidelines (FPG). Included in the FPG's for the Pisgah and Nantahala National Forest, is no stream disturbance during the trout spawning moratorium (October 15 thru April 15). This moratorium will protect any rainbow trout eggs and juveniles from being smothered or crushed during project implementation.

It is expected that long term benefits of stabilizing the stream banks and preventing further erosion will far out weigh possible short term impacts. Mobile organisms, such as rainbow trout, can move up or downstream to avoid disturbed areas within the stream.

Individuals of the rainbow trout community within the Hickey Fork activity area may be indirectly impacted by the activities associated with this project. These impacts are expected to be short term and will cease with site rehabilitation. There will be no impacts to the long-term viability of this rainbow trout population or the populations across the Forest.

**Table 3: MIS Estimated Population Trend and Biological Community or Habitat Component**

Species	Estimated Population Trend	Biological Community and/or Habitat Component
Acadian Flycatcher	Static to Decreasing	Riparian Community
Wild Brook, Brown and Rainbow Trout; Blacknose Dace	Static	Coldwater streams

**Table 4: Habitat Component, Forest-wide Estimates, and Expected Changes resulting from the Alternatives**

Habitat Component	Forest-wide Estimate	Alternative A	Alternative B	Alternative C
Early successional (0-10 years old)	26,800 ac (yr 2000) 2,040 ac (5 yr avg)	No change	No change	No change
Soft mast producing species	13,144 ac early seral (yr 2000), highest potential on 5,650 ac	No change	No change	No change
Hard mast-producing species (>40 yrs)	High El Red oak: 40,600 ac Mesic Oak/H: 283,340 ac Dry Mesic Oak/H: 21,800 ac Chestnut Oak/H: 8,600 ac Upland hwd (other): 6,900 ac	None affected	No change	No change
Permanent grass/forb openings	3,000 acres	No change	No change	No change
Downed woody debris	High accumulation small wood: 18,000; Large wood: 386,000; Low accumulation (approximately 600,000)	No change	No change	No change
Coldwater streams	2,100 miles	The existing 2.9 miles of stream will continue to receive off site movement of soil due to stream bank instability	Temporary fluctuations in sediment and turbidity will occur during project implementation of the 2.9 miles of coldwater stream. Will cease with site rehabilitation.	Temporary fluctuations in sediment and turbidity will occur during project implementation of the 2.9 miles of coldwater stream. Will cease with site rehabilitation.
Coolwater streams	400 miles	None affected	None affected	None affected
Warmwater stream	211 miles	None affected	None affected	None affected
Reservoirs	30,200 acres	None affected	None affected	None affected



