



File Code: 1950-1

Date: August 1, 2007

Dear Interested Members of the Public and Forest Users:

Included with this letter is enclosed a Preliminary Analysis (PA) for the North Fork Mills River Stream Rehabilitation Project, located on the Pisgah Ranger District, Pisgah National Forest, in Henderson County.

The North Fork Mills River Recreation Area is within Forest Plan Management Area (MA) 12, Developed Recreation Area used by the public for camping, picnicking, and river recreation; and MA 18, Riparian Areas. Stream bank erosion near the picnic area has been addressed in the past with a stone and mortar wall and gabion baskets. Over time, both types of bank hardening have begun to degrade, resulting in additional maintenance. Rather than replacing in kind the gabion baskets, more natural channel design techniques are proposed that would not only stabilize stream banks, but also improve aquatic and riparian habitat, better meet the needs of the public, and help protect the historic stone and mortar walls. Additional activities are proposed within this 3,100 feet reach of river that would improve the stream ecosystem by improving channel stability and habitat quality, and improve riparian and streamside vegetation condition.

Purpose and Need for the Proposal

Within this reach of the North Fork Mills River, there is a need to stabilize stream banks, improve aquatic habitat, and restore riparian areas, while maintaining existing uses. With this action the Pisgah Ranger District is proposing to bring this area closer to the desired condition outlined in the Nantahala and Pisgah National Forests Land and Resource Management Plan (LRMP), as amended. The LRMP (pages III-181 and III-187) emphasizes the enhancement of riparian values, and the maintenance and protection of the natural hydrologic function of the stream channel, including stream banks and bed.

Proposed Action

To improve the stream ecosystem along this reach on the North Fork Mills River, the Pisgah Ranger District proposes the following:

- Remove degraded section of gabion baskets
- Slope back banks to a 2:1 slope along approximately 700 feet
- Stabilize and restore sloped banks with riparian type vegetation
- Relocate approximately 600 feet of gravel walking trail
- Under Alternative B, remove approximately 900 square yards of paved parking lot from the streamside zone, and relocate parking to a more desirable area
- Construct up to five J-hook type rock vanes
- Construct log vanes (4-5 each) and install root wads (7-10 each)
- Treat all floodplain areas for noxious, non-native invasive plants with herbicide and/or manual methods



- All disturbed ground would be quickly stabilized with native grass seed and mulch

Additional Information

Three alternatives have been developed and analyzed: Alternative A – No Action; and Alternatives B and C – Proposed Actions. The results of the analysis of the potential impacts of the proposed action and no-action alternatives are reported in the Preliminary Assessment (PA). The PA is posted on the National Forests in North Carolina website, <http://www.cs.unca.edu/nfsnc/nepa/nepa.htm>. I encourage your participation during this 30-day notice and comment period pursuant to 36 CFR 215.5. Following the notice and comment period, responses to the comments will be analyzed and a decision will be made. Pursuant to 36 CFR 215.11(a) and 215.15(a), my decision will initiate a 45-day appeal period; or, pursuant to 36 CFR 215.12(e), the decision will not be subject to appeal.

Only those who submit timely comments will be eligible to appeal the decision. If you would like to comment, it would be helpful if the comments were as specific as possible. You must provide the following information: 1) your name and address; 2) title of the proposed action; 3) specific comments (36 CFR 215.2) on the proposed action, along with supporting reasons that I should consider in reaching a decision; and 4) your signature or other means of identification. 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(a)(2&4), comments must be postmarked or received within 30 days beginning the day after publication of this notice in *The Asheville Citizen-Times*. Oral or hand-delivered comments must be received within our normal business hours of 8:00 a.m. to 4:30 p.m. Comments may be mailed electronically, in a common digital format, to: comments-southern-north-carolina-pisgah-pisgah@fs.fed.us. The subject line must contain the name of the project for which you are submitting comments and the sender should normally receive an automated electronic acknowledgement from the agency as confirmation of receipt. If the sender does not receive an automated acknowledgement of the receipt of comments, it is the sender's responsibility to ensure timely receipt by other means. Comments may be sent by regular mail to: Pisgah Ranger District, Attention: District Ranger, 1001 Pisgah Highway, Pisgah Forest, North Carolina, 28768 or faxed to 828-884-7527.

Please contact Brady Dodd, Project Leader, at 828-257-4214 if you have questions concerning this proposal. Thank you for your continued interest in the management of the Pisgah National Forest.

Sincerely,

RANDALL BURGESS
District Ranger

Enclosure: Preliminary Analysis (PA) for the North Fork Mills River Stream Rehabilitation Project



United States
Department of
Agriculture

Forest Service

August 2007



North Fork Mills River Stream Rehabilitation Project Preliminary Analysis

Pisgah Ranger District, Pisgah National Forest
Transylvania County, North Carolina



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 family 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, 14th and Independence Avenue, SW, Washington DC 20250-9510 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

Project:	North Fork Mills River Stream Rehabilitation Project Preliminary Analysis (PA)
Location of Action:	Pisgah Ranger District, Pisgah National Forest Transylvania County, North Carolina
Lead Agency:	USDA Forest Service
Responsible Official:	Randall Burgess, District Ranger 1001 Pisgah Highway Pisgah Forest, NC 28768
For More Information:	Brady Dodd, Forest Hydrologist, Project Leader (828) 257-4214 (828) 259-0584 (fax)
Send Electronic Comments to:	comments-southern-north-carolina-pisgah-pisgah@fs.fed.us

SUMMARY

The North Fork Mills River Recreation Area is a Forest Plan Management Area (MA) 12, Developed Recreation Area used by the public for camping, picnicking, and river recreation, and MA 18, Riparian Areas. Stream bank erosion near the picnic area has been treated in the past with a stone and mortar wall and gabion baskets. Over time, both types of bank hardening have begun to degrade, resulting in a need for maintenance. Rather than replacing in kind the gabion baskets, more natural channel design techniques are proposed that would not only stabilize stream banks, but also improve aquatic and riparian habitat, better meet the needs of the public, and help protect the historic stone and mortar walls. Additional activities are proposed within this 3,100 foot reach of river that would improve the stream ecosystem by improving channel stability and habitat quality, and improve riparian and streamside vegetation condition.

In this preliminary analysis (PA), the Pisgah Ranger District is proposing the actions to bring the project area closer to the desired condition outlined in the Nantahala and Pisgah National Forests Land and Resource Management Plan, as amended. To improve the stream ecosystem along this reach on the North Fork Mills River, the Pisgah National Forest proposes the following:

- Remove degraded section of gabion baskets
- Slope back stream banks to a 2:1 slope along approximately 700 feet
- Stabilize and restore sloped stream banks with riparian type vegetation
- Relocate approximately 600 feet of gravel walking trail
- Remove approximately 900 square yards of paved parking lot from the streamside zone, and relocate parking to a more desirable area
- Construct up to five J-hook type rock vanes
- Construct log vanes (4-5 each) and install root wads (7-10 each)
- Treat all floodplain areas for non-native invasive plants
- All disturbed ground would be quickly stabilized with native grass seed and mulch

The project proposal calls for planting the river banks with native trees and shrub, and reseeded areas impacted by heavy equipment with annual native grasses.

In addition to this action alternative (Alternative B), the Forest Service evaluated a second action alternative, Alternative C. Alternative C differs from Alternative B only by omitting the removal and relocation of the parking area. Under Alternative C, the streamside zone currently occupied by the parking area would not be restored. Since this length of stream bank would remain at risk of erosion and failure, the proposed rock vanes of Alternative B are also proposed in this alternative to protect the stream bank.

In addition to these action alternatives (Alternative B and C), the Forest Service evaluated a no-action alternative (Alternative A). The no-action alternative would not take any action to improve the stream bank condition in the North Fork Mills River corridor.

Under the no-action alternative, current management plans would continue to guide management of the project area. However, river bank stabilization would not be implemented, which would result in continued short and long-term sedimentation and damage to recreation sites. Additionally, this alternative would not contribute to the goals and objectives of the Nantahala and Pisgah National Forest Land and Resource Management Plan, as amended. Short-term input of sediment and disruption of recreation activities through implementation of this project would be mitigated by project design criteria, including use of Best Management Practices (BMPs).

Based on the analysis, the responsible official will decide to select the no-action alternative or one of the action alternatives.

Table of Contents

Chapter 1 – Purpose and Need.....	1
1.1 Document Structure	1
1.1.1 Project Record.....	1
1.2 Background.....	2
1.3 Purpose and Need for Action.....	4
1.4 Proposed Action.....	5
1.5 Decision Framework.....	5
1.6 Public Involvement	5
1.7 Issues.....	5
1.7.1 Key Issues	6
1.7.2 Non-Key Issues.....	6
Chapter 2 – Alternatives	8
2.1 Range of Alternatives	8
2.2 Alternatives Considered in Detail.....	8
2.2.1 Alternative A – No Action.....	8
2.2.2 Alternative B – Proposed Action	8
2.2.3 Alternative C – Proposed Action	9
2.3 Design Criteria.....	15
2.3.1 Monitoring	15
2.4 Comparison of Alternatives	15
Chapter 3 – Environmental Consequences	20
3.1 Effects Related to Key Issue #1; Scenic Resources.....	22
3.1.1 Existing Condition	22
3.1.2 Alternative A – No Action.....	22
3.1.3 Alternative B & C – Proposed Actions.....	22
3.2 Effects Related to Key Issue #2; Aquatic Habitat	23
3.2.1 Existing Condition	23
3.2.2 Alternative A – No Action.....	24
3.2.3 Alternative B & C – Proposed Actions.....	24
3.3 Effects Related to Key Issue #3; Hydraulics/Water Quality	25
3.3.1 Existing Condition	25
3.3.2 Alternative A – No-action.....	26
3.3.3 Alternative B & C– Proposed Actions.....	27
3.4 Effects Related to Key Issue #4; Recreation.....	28
3.4.1 Existing Condition	28
3.4.2 Alternative A – No Action	29
3.4.3 Alternative B & C – Proposed Actions	29
3.5 Other Resource Concerns	29
<i>Threatened, Endangered and Sensitive Species.....</i>	<i>29</i>
3.5.1 Existing Condition	29
3.5.2 Alternative A – No Action	32
3.5.3 Alternative B & C – Proposed Actions	32

Proposed, Endangered, Threatened, and Sensitive Species Determination of Effects ... 33

3.5.4 Existing Condition 33

3.5.5 Alternative A – No Action 35

3.5.6 Alternative B – Proposed Action..... 35

3.6.1 Introduction & Existing Condition 36

3.6.2 Alternative A – No Action 39

3.6.3 Alternative B – Proposed Action..... 40

3.7.1 Existing Condition 41

3.7.2 Alternative A – No Action 41

3.7.3 Alternative B & C – Proposed Actions 41

CHAPTER 4 – PREPARERS AND PUBLIC INVOLVEMENT 43

4.1 ID Team Members 43

4.1.1 Core IDT: 43

4.1.2 Other Forest Service Personnel Providing Input: 43

4.2 Federal, State, and Local Agencies..... 43

Literature Cited 44

Table of Figures

Figure 1. North Fork Mills River Stream Rehabilitation Project Vicinity Map.....10

Figure 2. North Fork Mills River – Sketch of Current Condition and Proposed Action at the upstream reach for Alternative B. Alternative C would leave parking area in place.....11

Figure 3. North Fork Mills River – Sketch of Current Condition and Proposed Action at the downstream reach for Alternatives B and C.....12

Figure 4. Typical J-Hook Type Rock Vane detail.....13

Figure 5. Typical Log Vane detail.....13

Figure 6. Typical Root-wad detail.....14

Table of Tables

Table 1. Alternative Comparison Table for North Fork Mills River Stream Rehabilitation Project.....15

Table 2. Past, current, and foreseeable future management activities (anticipated in the next few years) within the analysis area, North Fork Mills River watershed.....20

Table 3. Known and potential TES species evaluated for this project.....32

Table 4. Habitat for Forest Concern rare species likely to occur within the activity areas affected by the North Fork Mills River stabilization project.....35

Table 5. Biological communities and associated MIS (using Forest Plan EIS, Table III-8).....37

Table 6. Special Habitats and associated MIS (using Forest Plan EIS, Table III-9).....38

Table 7. Biological communities and special habitats, and estimated change in each alternative.....39

Chapter 1 – Purpose and Need

1.1 Document Structure

The Forest Service has prepared this Preliminary Analysis (PA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. All action alternatives will meet the standards and guidelines in the Nantahala and Pisgah National Forests Land and Resource Management Plan, as amended (Forest Plan).

This PA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters and appendices:

Chapter 1 – Purpose and Need: This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2 – Alternatives: This section provides a more detailed description of the agency’s proposed action as well as alternative methods for achieving the stated purpose and need. These alternatives were developed based on key issues raised internally, by the public and other agencies. This section also provides a summary table of the alternatives.

Chapter 3 – Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by key issues. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provide a baseline for evaluation and comparison of the other alternatives that follow.

Chapter 4 – Preparers and Public Involvement: This section provides a list of preparers and members of the public consulted during the development of the environmental assessment.

1.1.1 Project Record

This PA incorporates by reference the project record (40 CFR 1502.21). The project record contains specialist reports and other technical documentation used to support the analysis and conclusions in this PA.

Relying on specialist reports and the project record helps implement the CEQ Regulations’ provision that agencies should reduce NEPA paperwork (40 CFR 1500.4) and that NEPA documents be analytic rather than encyclopedic and kept concise and no longer than absolutely necessary (40 CFR 1502.2). The objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated, without repeating detailed analysis and background information available elsewhere. The project record is located at the Pisgah Ranger District Office in Pisgah Forest, North Carolina.

1.2 Background

The North Fork Mills River watershed is mostly forested and predominantly in federal ownership. Past management in the watershed within the last hundred years included logging much of the timber using roads and splash dams to transport timber downstream to local mills. Following harvest, much of the flatter terrain was used for farming and small homesteads. The North Fork Mills River watershed contains the municipal watershed for the town of Hendersonville, NC in the Big Creek drainage. This project is proposed within and just downstream of the North Mills River Recreation Area (Recreation Area), an area used for picnicking, camping, and water-based recreation. This section of channel and valley bottom has been impacted in the past by logging and farming. It is currently impacted by stream bank hardening, a loss in streamside vegetation from development, and non-native invasive plants. As a result, sections of stream bank within the reach are unstable; aquatic habitat diversity is lacking; and streamside and alluvial forests are degraded.

The North Fork Mills River is characterized by the state of North Carolina as having a predominantly undeveloped water supply watershed, high quality trout waters. Currently all protected uses are supported; including secondary and primary recreation, fishing, aquatic life, and wildlife. This project would improve the stream ecosystem by improving channel stability and habitat quality, along with improving riparian and streamside vegetation conditions.

The proposed action is located in and immediately adjacent to the North Fork Mills River (Figure 1). Management of this area has to meet standards and guidelines for each of the following classifications:

- The Recreation Area is located within Management Area (MA) 12 (developed recreation areas – Forest Plan Amendment 5, pp. III-140 – III-143).
- The North Fork Mills River is located within MA 2A (visually pleasing scenery for forest visitors– Forest Plan Amendment 5, pp. III-63 – III-70) and MA 18 (riparian areas – Forest Plan Amendment 5, pp. III-179 – III-189).
- MA 18 is within and immediately adjacent to the river so it is embedded within other MAs. The North Fork Mills River is also identified as eligible for classification as a “Recreation” Wild and Scenic River (Forest Plan Amendment 5, pp. III-11 and III-14 – III-19).
- The North Carolina Department of Environment, Health and Natural Resources classified the North Fork Mills River as High Quality Waters (Forest Plan Amendment 5, p. B-6).

The project analysis area consists of approximately 3,100 feet of stream channel and 15 acres of adjacent alluvial forest on the North Fork Mills River. The analysis area is the geographic range that cumulative effects can reasonably be analyzed, may vary by resource, and unless stated otherwise in this document, is downstream of the analysis area to the Forest boundary—the analysis area is larger than the project area.

The Forests are administered through a combination of management areas, each of which has unique goals, management direction and standards. These management areas represent different physical and biological characteristics that lend themselves to such management. Much of this project is located in riparian areas (Management Area 18) and this action also helps move the project area toward the desired conditions as described for this management

area (Forest Plan pages III-179 to III-189). Direction for management of this area that is pertinent to the proposed action is highlighted here:

- Manage area so that management activities are not generally a dominant feature of the landscape.
- Maintain appropriate stream temperatures and stream environment and protect stream banks.
- Maintain the natural hydraulic and hydrologic functioning of the stream channel and protect the integrity of the stream system including channel, banks and stream bottom.

This project is partially located in developed recreation areas (Management Area 12) and this action helps move the project area toward the desired conditions as described for this management area (Forest Plan pages III-140 to III-143). Direction for management of this area that is pertinent to the proposed action is highlighted here:

- Manage, maintain, and develop sites to enhance activities associated with a forest environment to provide a safe, aesthetically pleasing, non-urban atmosphere and to support dispersed recreation opportunities.
- Rehabilitate and stabilize eroding areas.

The North Fork Mills River is also identified as eligible for classification as a “Recreation” Wild and Scenic River (Forest Plan Amendment 5, pp. III-11 and III-14 – III-19). Direction for management of this area that is pertinent to the proposed action is highlighted here:

- Provide interim protection for eligible rivers, which are recommended for further study by precluding management activities whose effects could foreclose the potential classification.
- Maintain all eligible rivers in a free flowing condition.
- Allow construction of new minor fish habitat structures such as log deflectors and random boulder placement.

The North Carolina Department of Environment, Health, and Natural Resources classified the North Fork Mills River as High Quality Waters (Forest Plan Amendment 5 p. B-6). Direction for management of this area that is pertinent to the proposed action is highlighted here:

- The area will be actively managed to protect and enhance, where possible, the distinctive resource values and characteristics dependent on or associated with these systems.
- Manage activities to meet water resource objectives and attain the goals of the Clean Water Act.

All work done in the river would require a 404 permit issued by the U.S. Army Corps of Engineers, Section 401 Water Quality Certification from NC Division of Water Quality, consultation with N.C. Wildlife Resources Commission, and a trout buffer zone waiver from the N.C. Dept. of Environment and Natural Resources.

1.3 Purpose and Need for Action

The purpose and need (objective) of this proposal is to improve the health of the stream ecosystem by improving channel stability and habitat quality, along with improving riparian and streamside vegetation conditions. The desired condition is to have high quality riparian areas that maintain hydrologic function, enhance stream stability, minimize erosion (Forest Plan Amendment 5, page III-179), protect recreation facilities from erosion (Forest Plan Amendment 5, page III-140), and maintain the attributes which qualify North Fork Mills River as an eligible Wild and Scenic River (Forest Plan Amendment 5, page III-18). The proposed action is needed at this time, at these locations, because taking no action would lead to further erosion and sedimentation which, in turn, would cause further damage to aquatic habitat and recreation sites.

This PA incorporates the Forest Plan and all relevant laws, acts, and executive orders. The proposed action addresses the following goals outlined in the Forest Plan (pages III-1 and III-2) and summarized here:

- Blend the needs of people and environmental values in such a way that the Nantahala and Pisgah National Forests sustain ecosystems that are diverse, productive, and resilient to short-term stress and long-term change through principles of multiple-use and sustained-yield.
- Improve the quality of life for citizens of western North Carolina by helping to meet the basic needs of people and communities who depend on National Forest resources for water, food, fuel, shelter, livelihood, recreation, and spiritual renewal.
- Maintain and, where possible, enhance the diversity of plant and animal communities of the southern Appalachians. Maintain viable populations of existing native wildlife, fish, and plants.
- Protect the beauty of the Forests through special attention to visually sensitive areas and the careful application of resource management activities.
- Provide different environmental and social settings for outdoor recreation opportunities that range from primitive to developed.

This action also helps move the project area toward specific desired conditions outlined in the Forest Plan's Forest-wide Management Requirements (pages III-14, III-24, III-25, and III-40) that help meet the Forest-wide goals, desired future conditions, and objectives. These are:

- Manage North Fork Mills River to retain values, which qualify it as a Wild and Scenic River.
- Provide structural habitat improvements. Give priority to the use of native materials and mimic naturally occurring structures.
- Maintain and improve aquatic species diversity.
- Protect and improve fisheries habitat.
- Emphasize the protection of all developed stream channels. Protect the integrity of intermittent and ephemeral stream channels, including their banks and beds.

1.4 Proposed Action

The U.S. Forest Service proposes to improve stream ecosystem health within the North Fork Mills River by rehabilitating channel banks, improving aquatic and riparian habitat, and converting alluvial forests back towards the desired conditions. The Proposed Action was developed by the Forest Service to meet the Purpose and Need of this project. A more detailed discussion on the Proposed Action is located in Chapter 2, Alternatives. Project implementation is expected to be completed over several years as funding becomes available. The following actions are proposed for this project (Figures 2 and 3):

- Remove all gabion baskets
- Slope back banks to a 2:1 slope along approximately 950 feet
- Stabilize and restore sloped banks
- Relocate approximately 600 feet of gravel walking trail
- Remove approximately 900 square yards of paved parking lot from the streamside zone
- Construct five J-hook type rock vanes
- Construct log vanes (4-5 each) and install root wads (7-10 each)
- Reestablish streamside zone to a minimum of 50 feet wide into an existing wildlife opening
- Treat all floodplain areas for noxious, non-native invasive plants

1.5 Decision Framework

Based on the analysis disclosed in this PA, the responsible official will make a decision and document it in a decision notice (DN) and finding of no significant impact (FONSI). The Responsible Official can:

- Select the action alternative (Alternative B) that has been considered in detail, or
- Select a modified action alternative, or
- Select the no-action alternative (Alternative A).

1.6 Public Involvement

The project was listed in the April 2007 Schedule of Proposed Actions (SOPA) under North Fork Mills River Stream Rehabilitation Project PA. Additionally, this document will serve as both a request for scoping and comment (40 CFR 1501.8).

1.7 Issues

Issues are defined as a point of discussion, debate, or dispute about environmental effects. Issues are used to develop alternatives, mitigation measures, or analyze environmental effects. The Forest Service separated issues into two groups: key and non-key issues.

The Council on Environmental Quality (CEQ) regulations specifies that environmental analysis focus on significant (key) issues. Issues determined not to be significant (non-key) shall be discussed only briefly and eliminated from detailed study [40 CFR 1500.1(b), 1500.2(b), 1500.4(c), 1501.7(3), and 1502.2(b)]. The key issues will be analyzed in Chapter 3 of this PA and will also help form the decision. The non-key issues will be disclosed here in Chapter 1 but not analyzed in Chapter 3. They will not be used to form the decision.

1.7.1 Key Issues

1.7.1.1 Key Issue #1: Scenic Resources

Removing gabion baskets, sloping back eroded stream banks, and design and placement of rock vanes and log structures may adversely affect scenic resources.

Indicator

- Methods of stream bank stabilization-how natural would the stream look after implementation

1.7.1.2 Key Issue #2: Aquatic Habitats

Removing gabion baskets, sloping back eroded stream banks, and constructing rock vanes and log structures may adversely affect aquatic habitats.

Indicators

- Length of stream stabilized and pool habitat created
- Timing of project implementation

1.7.1.3 Key Issue #3: Hydraulics/Water Quality

Removing gabion baskets, sloping back eroded stream banks, and constructing rock vanes and log structures may alter the hydraulics of the North Fork Mills River and increase potential for sediment delivery. Treating invasive plants near streams may affect water quality.

Indicators

- Length of stream stabilized
- Area non-native invasive plants treated

1.7.1.4 Key Issue #4: Recreation

Placing rock vanes may adversely impact recreational users, especially fishermen.

Indicator

- Ability of recreationists to use the river after construction, especially fishermen

1.7.2 Non-Key Issues

1.7.2.1 Non-key Issue A –Soils:

Constructing stream structures may impact soils

- Non-key Issue due to implementation of Forest Plan standards and guidelines and Best Management Practices (BMPs).

1.7.2.2 Non-key Issue B – Threatened, Endangered, Sensitive and Forest Concern Species:

Constructing stream structures may impact federally threatened, endangered, or Forest sensitive botanical resources.

- Non-key Issue due to site-specific field verification. There would be no effect to federally listed threatened, endangered, or regionally sensitive (TES) botanical species, or Forest Concern botanical species. There are none of these species present in the project area; suitable habitat in the project area is very marginal; and/or the proposal is so small in scale it would have little effect on potential populations of any species.

Constructing stream structures may impact federally threatened, endangered, or Forest sensitive wildlife species and their habitat.

- Non-key Issue due to site-specific field verification. There is only one threatened, endangered, or Forest sensitive (TES) wildlife species that could be affected by the proposal (bog turtle, *Clemmys muhlenbergii*, a threatened species), but it is not likely to occur in the project or analysis area. As a result, there would be no effect to TES wildlife species or their habitat by the proposal.

1.7.2.3 Non-key Issue C – Safety of Rock Vanes:

The use and placement of rock vanes may decrease safety to some recreation users.

- Non-key Issue because rock vanes would not increase flow velocity passing the structures during flows to levels where a person could not wade in the area. Based on the general USGS safety standard (depth x velocity <6), the summer average flows would be safe for wading up to four feet of water depth (see also Sections 3.3.3.1 and 3.3.4.1, Chapter 3).

1.7.2.4 Non-key Issue D – Invasive Plant Species:

Constructing stream structures may increase the presence of invasive plant species.

- Non-key Issue because invasive plant species are already present and would continue to increase in areas of disturbed stream banks. The project would stabilize stream banks, including planting with native species, reducing the amount of exposed soil available for invasive plant species to become established. Also, both proposed actions would treat for non-native invasive plant species.

Chapter 2 – Alternatives

This chapter describes and compares the alternatives considered for the North Fork Mills River project. It includes a description and map of each alternative considered. This section presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the Responsible Official, the Pisgah District Ranger, and the public.

2.1 Range of Alternatives

The range of alternatives developed and analyzed by the interdisciplinary team (IDT) was driven by the purpose and need underlying the proposed action, and by the key issues responding to the proposed action. An alternative to the proposed action must (1) reasonably respond to the purpose and need and (2) address one or more key issues. The only exception is the No-action Alternative, which is required under 40 CFR 1502.14(d). The IDT considered three alternatives. Following internal review, all three alternatives were developed in detail.

2.2 Alternatives Considered in Detail

2.2.1 Alternative A – No Action

Under the No Action Alternative, current plans would continue to guide management of the project area.

2.2.2 Alternative B – Proposed Action

Alternative B includes the following actions which would be done by hand, tracked excavator, and/or dump truck. Disturbed areas would be seeded with native grasses and/or planted with native trees and shrubs (e.g. sycamore, mountain doghobble, sweet pepperbush, and rhododendron). This alternative proposes the following (Figures 2 and 3):

- Remove sections of gabion baskets. The left downstream bank has 500 feet of gabions, of which the downstream 250 feet has degraded and failed. Approximately 150 cubic yards of cobble from the gabions and the wire mess would be removed from the site. Downstream on the right stream bank is a failed length of gabion, about 100 feet long, with only wire remaining.
- Slope back stream banks to a 2:1 slope along approximately 700 feet using a tracked excavator. The three sites are located along 250 feet of the removed gabion basket, on about 200 feet of right bank in the middle of the project reach, and about 250 feet of left bank at the bottom of the project reach. Excavated material would be removed from the sites off federal land.
- Construct streamside fencing along approximately 500 feet of stream bank in the picnic area. Fence would be split rail and would have openings to provide recreational and disabled access to the streamside.
- Stabilize and restore sloped stream banks by implementing standard erosion control practices including matting, native seed, mulch, and native riparian tree and shrub plantings.

- Relocate approximately 600 feet of gravel walking trail located in the picnic area to a minimum of 10 feet away from the stream bank. The pathway would meet disabled access standards for developed recreation sites. This work would include the removal of a culvert in a perennial stream and could make use of an existing footbridge.
- Remove approximately 900 square yards of paved parking lot away from the top of stream bank to reestablish a stable streamside zone 30 feet wide at a minimum. This area would be decompacted and planted with trees and shrubs. Soil excavated from stream banks may be used at this site to amend the soil. The parking lot would be redesigned and reconstructed to accommodate parking needs. The parking lot, or a portion of the lot, may be relocated more centrally in the picnic area closer to the toilet facilities and farther away from the stream. Stormwater collection would be incorporated into the design to reduce parking lot runoff. An accessible pathway would be maintained or developed between the parking lot, toilet, and streamside trail.
- Construct five J-hook type rock vanes in the upstream half of the reach. These structures would enhance stability of the reach, improve habitat diversity and habitat feature quality (e.g., deeper pools), and improve recreational opportunities.
- Construct log vanes (4-5 each) and install root wads (7-10 each) in the lower section of the reach in the main channel and side channel. These structures would enhance stability of the reach, improve habitat diversity and habitat feature quality (e.g., deeper pools), and improve recreational opportunities.
- Re-establish streamside zone to a minimum of 50 feet wide into the wildlife opening. Following the sloping back of this approximately 200 feet long bank, plant within the wildlife opening area of about 0.2 acres in trees and shrubs to reestablish streamside forest conditions.
- Treat all floodplain areas for non-native invasive plants. There is approximately 15 acres of area where non-native invasives are currently established. Forested conditions have been adversely impacted in this area by these plants and have put stream and wetland health at risk. This activity would include cutting by hand and machine, the use of herbicide, and planting of trees and shrubs where appropriate.

2.2.3 Alternative C – Proposed Action

Alternative C proposes the same activities as Alternative B except that it would not remove approximately 900 square yards of paved parking lot away from the top of the stream bank.

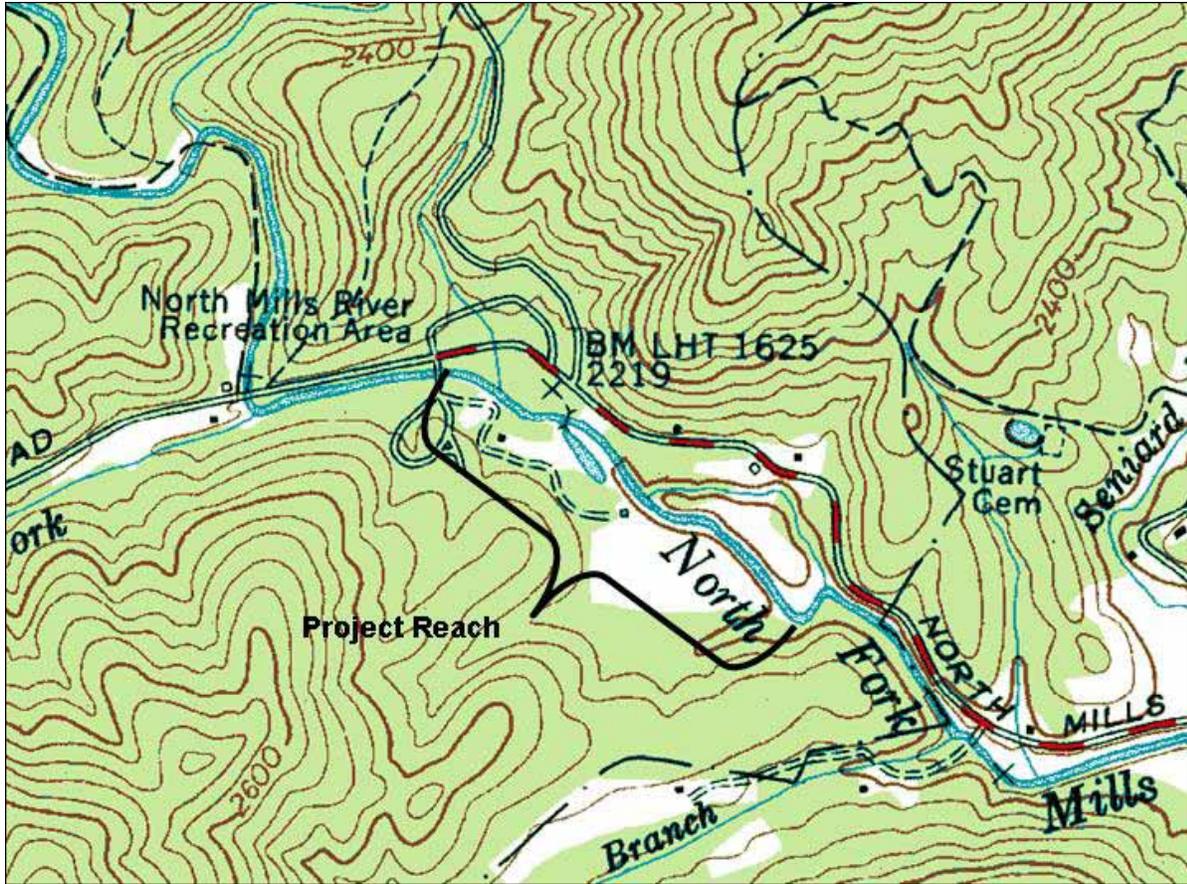


Figure 1. North Fork Mills River Stream Rehabilitation Project Vicinity Map.

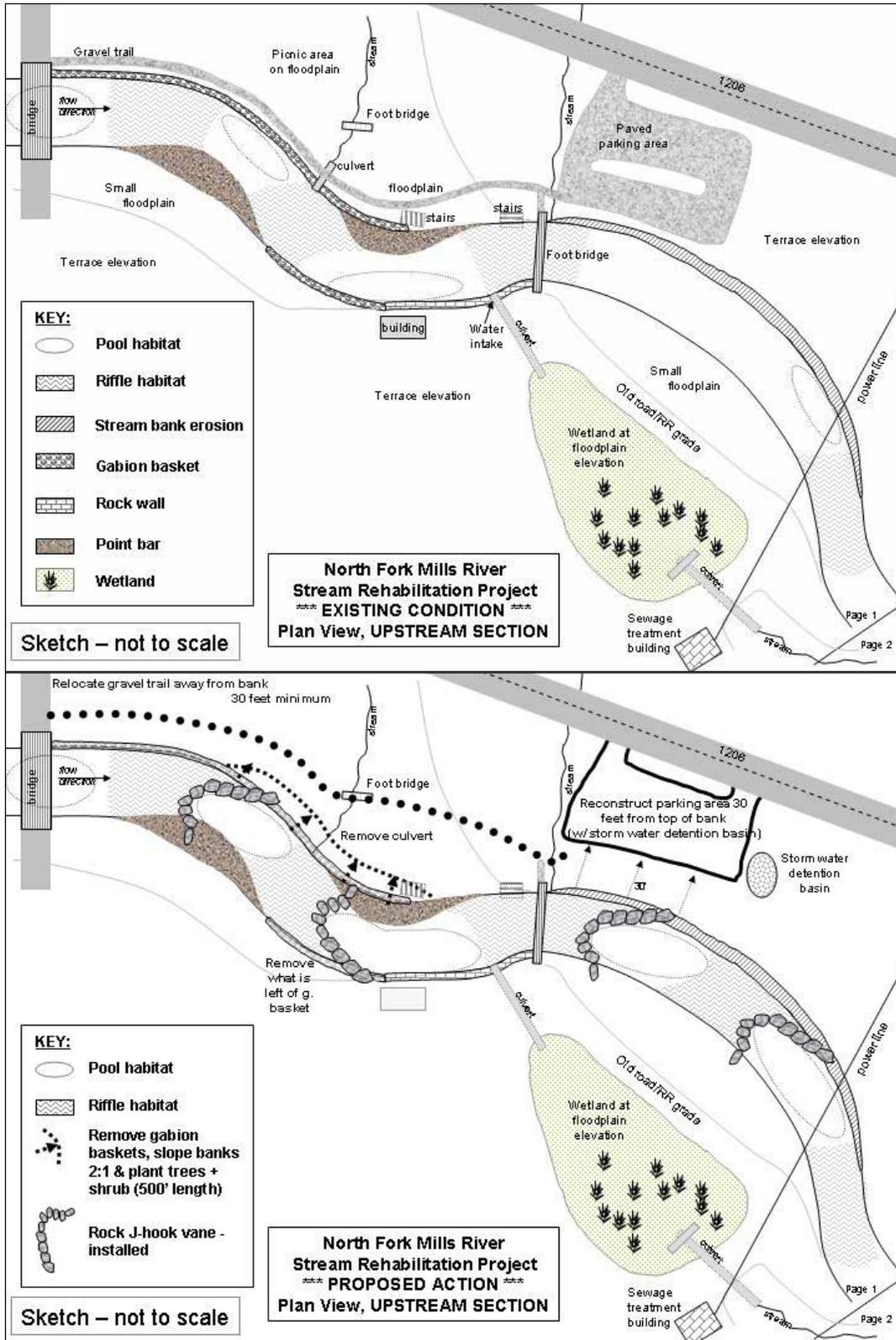


Figure 2. North Fork Mills River – Sketch of Current Condition and Proposed Action at the upstream reach for Alternative B. Alternative C would leave parking area in place.

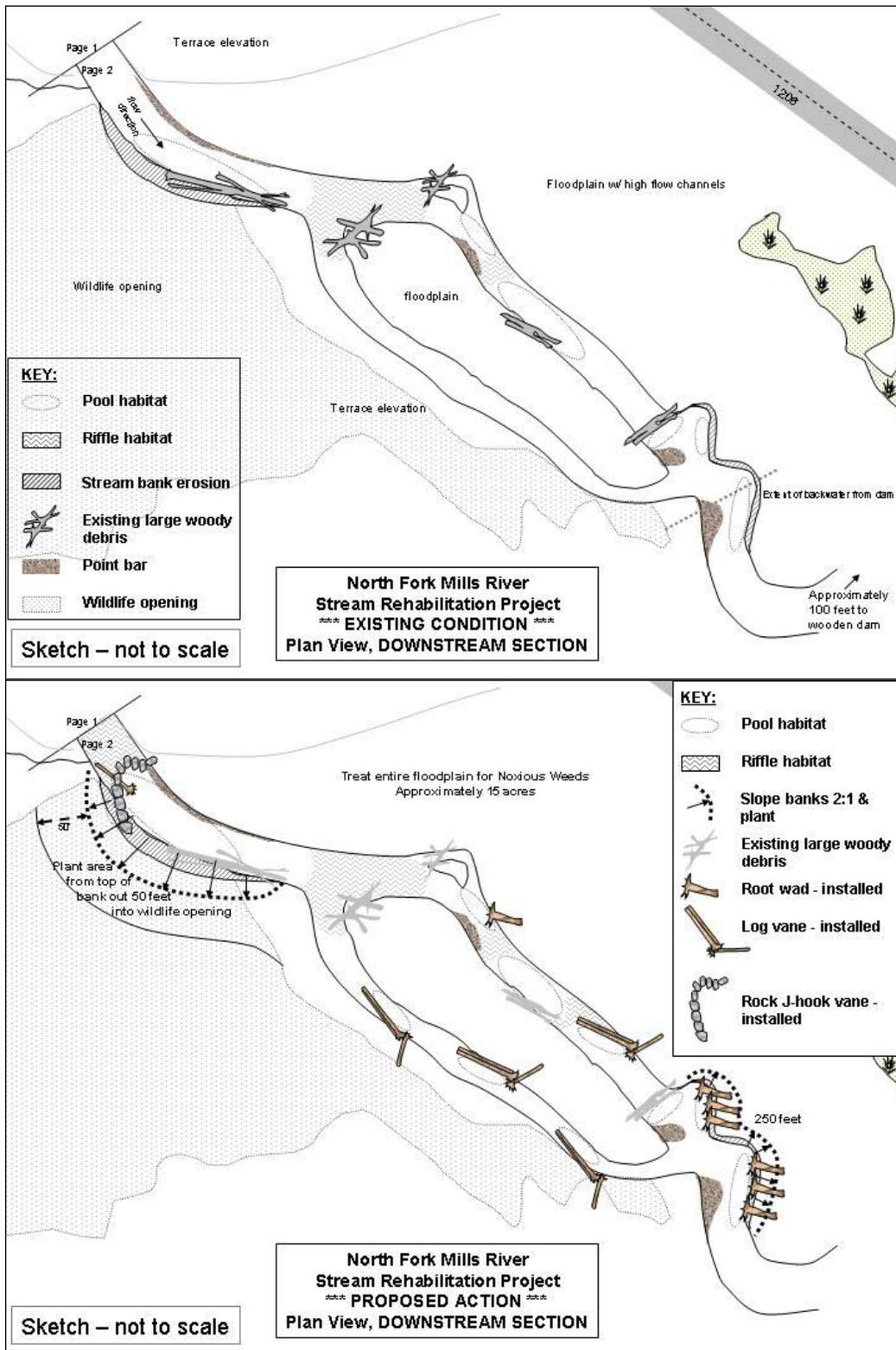


Figure 3. North Fork Mills River – Sketch of Current Condition and Proposed Action at the downstream reach for Alternatives B and C.

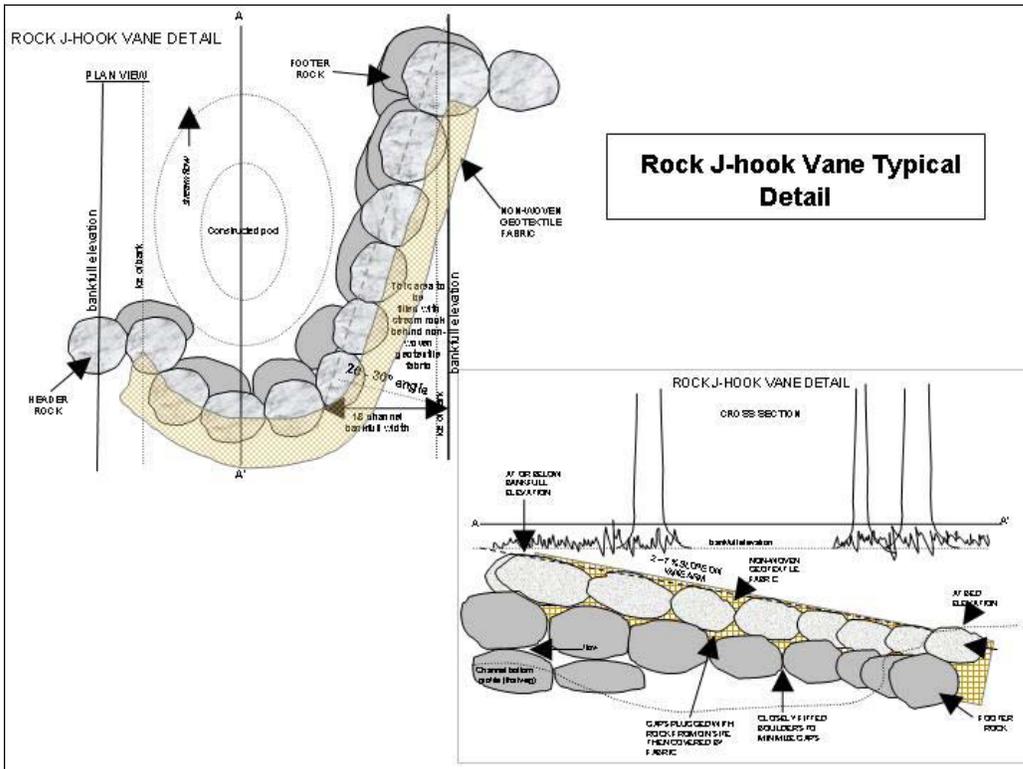


Figure 4. Typical J-Hook Type Rock Vane detail.

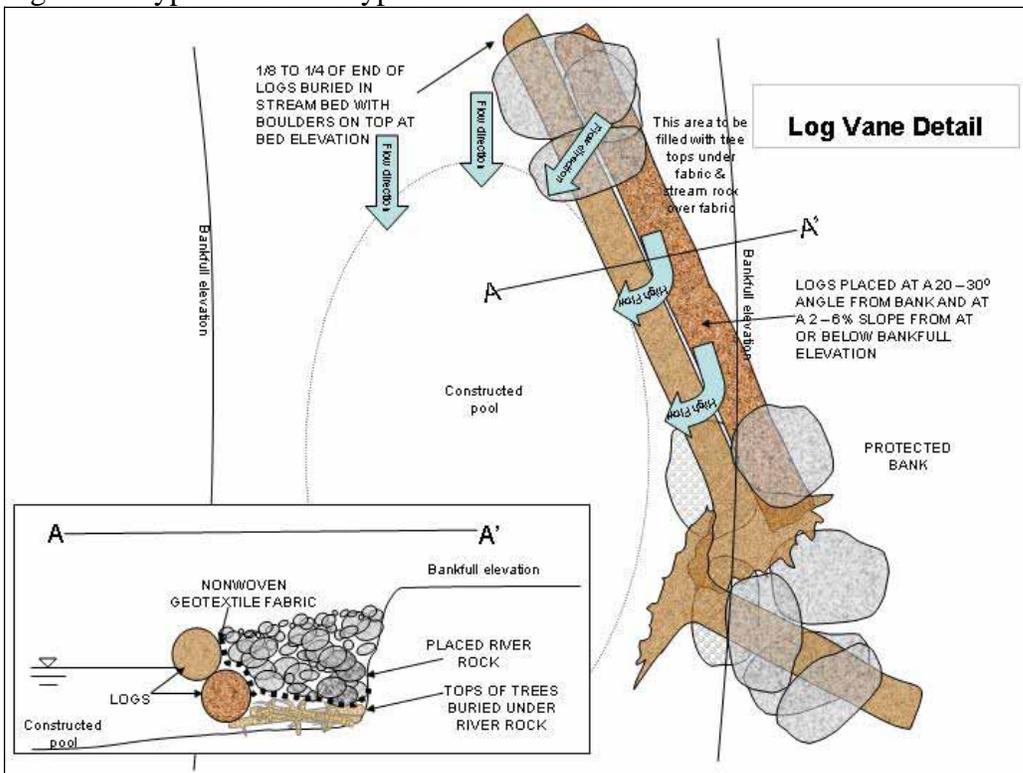


Figure 5. Typical Log Vane detail.

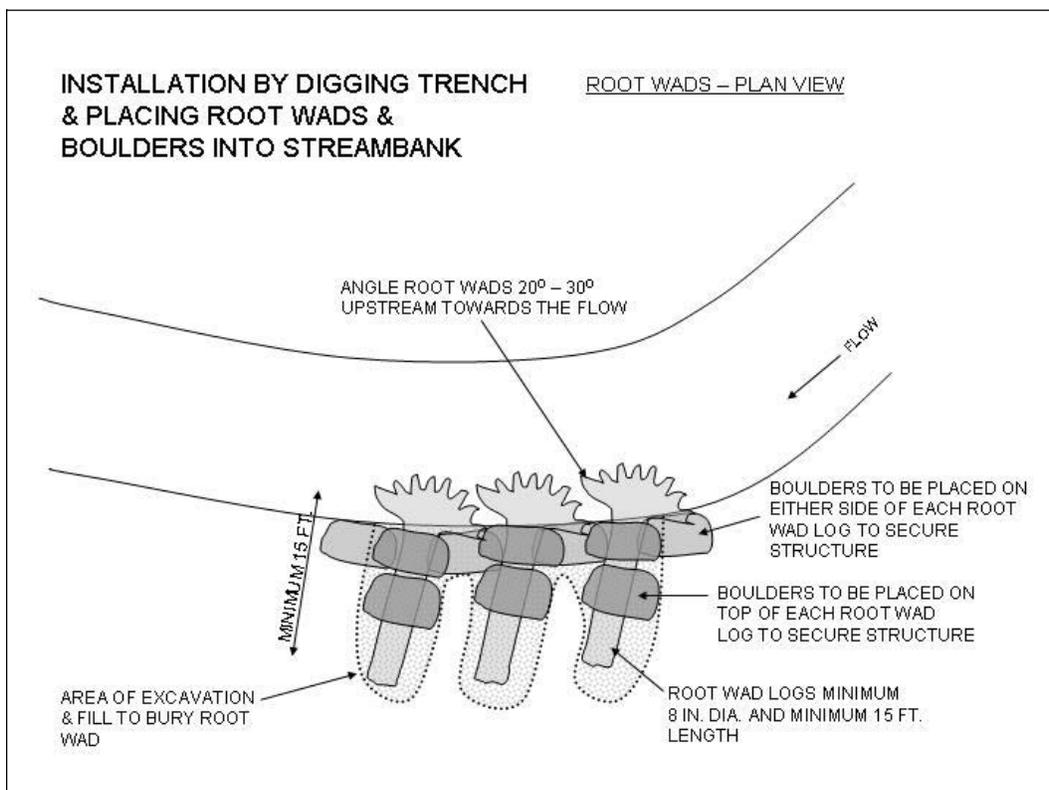
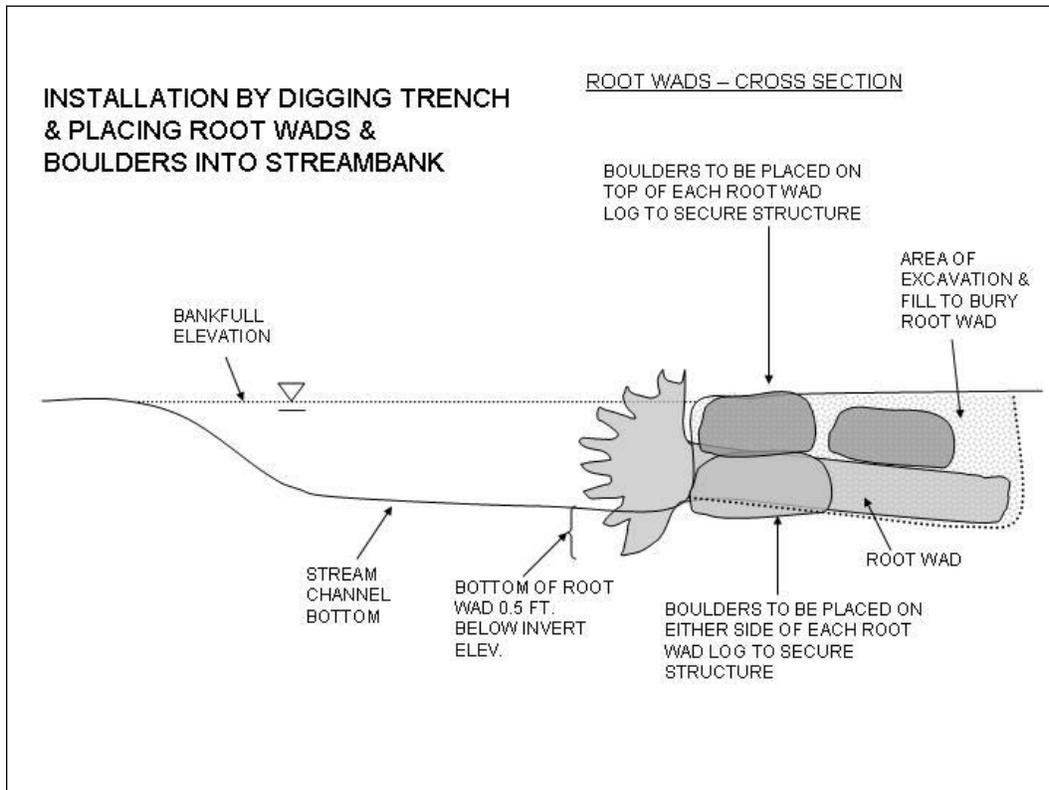


Figure 6. Typical Root-wad detail.

2.3 Design Criteria

The following design criteria will be incorporated in all action alternatives:

- Implementation of any alternative will follow best management practices (BMPs) for in stream work as determined by the North Carolina Department of Environment and Natural Resources;
- The action alternative will meet all Forest Plan standards and guidelines; An Army Corps of Engineers 404 permit, Section 401 Water Quality Certification, and a Trout Buffer Zone Waiver would be obtained prior to implementation; and
- To ensure adherence to Forest Plan standards for scenery, a Forest Service Landscape Architect will be consulted in the final design and construction phases of the rock vanes to meet all visual quality objectives.

2.3.1 Monitoring

All required Forest Plan monitoring would be accomplished.

2.4 Comparison of Alternatives

The following tables compare the issues based on each alternative.

Table 1 - Alternative Comparison Table for North Fork Mills River Stream Rehabilitation Project

Key Issues	Alternative A No Action	Alternative B	Alternative C
Issue 1: Scenic Resources			
Short-term impacts (<1 year)	Bare river banks and broken gabion baskets would remain visually unattractive due to difficulty in plants becoming established on steep, eroding soils. Streamside areas overgrown with invasive plants would continue to degrade visual quality.	Timing during summer months with heavy equipment and disturbance would visually impact recreationists until the plants and grass become established. In the short term, the area would appear unnatural while the plantings get established.	Same as Alternative B.

Key Issues	Alternative A No Action	Alternative B	Alternative C
<p>Long-term impacts (>1 year)</p>	<p>There would be continued degradation of channel and banks creating a more visually unattractive area.</p> <p>Alluvial, streamside forests would continue to degrade due to invasive plants resulting in a further loss of natural forest views.</p>	<p>There would be less sediment movement because the banks would be stabilized. Downed trees (woody debris) would still be present but rearranged.</p> <p>There would be improved visual attractiveness because of natural rock placement and native plant placement.</p> <p>Planted banks and areas treated for invasive plants would be more visually attractive and over time, the appearance would be indistinguishable from naturally established vegetation.</p>	<p>Same as Alternative B.</p>
<p>Issue 2: Aquatic Habitats</p>			
<p>Short-term impacts (<1 year)</p>	<p>Eroded stream banks would continue to contribute sediment to the river and degrade aquatic habitat.</p>	<p>Placement of rock vanes and log structures would cause short-term turbidity during construction but enhance aquatic habitat upon completion. Stream bank erosion and subsequent sedimentation would be reduced should flooding occur in the short-term.</p>	<p>Same as Alternative B.</p>

Key Issues	Alternative A No Action	Alternative B	Alternative C
<p>Long-term impacts (>1 year)</p>	<p>Unstable banks would continue to erode causing degradation of aquatic habitats.</p> <p>Alluvial, streamside forests would continue to degrade due to invasive plants resulting in a further loss of “recruitable” large wood to the river.</p>	<p>Rock vanes and log structures would help direct flows away from stream banks, decreasing erosion, sedimentation, and turbidity in stream.</p> <p>Habitat quality would be improved because of the pool habitat formed by the vanes. Roots from new plantings would hold soil thus, reducing sediment and improving aquatic habitat.</p> <p>Treatment of non-native invasive plants, stabilizing stream banks, removal of the gabion baskets, and relocation of trail and parking area, and streamside planting would improve streamside vegetation and large wood recruitment important for aquatic habitat.</p>	<p>Same as Alternative B, except that streamside vegetation and future large woody debris recruitment would not be improved at the parking lot location. Increased runoff from the parking area would continue to drain almost directly to the stream channel.</p>
<p>Issue 3: Hydraulics / Water Quality</p>			

Key Issues	Alternative A No Action	Alternative B	Alternative C
<p>Short-term impacts (<1 year)</p>	<p>The hydraulics of river flow through this reach would not change unless a flood occurred; this could increase bank erosion.</p> <p>Water quality would continue to degrade due to erosion of stream banks during high streamflows.</p>	<p>Construction of rock and log vanes would alter the hydraulics of the reach and help stabilize banks and create and maintain aquatic habitat features.</p> <p>Placement of rock vanes and log structures would cause turbidity during construction but would reduce water quality impacts from stream bank erosion and sedimentation.</p> <p>Treatment of invasive plants mechanically and chemically would not impact water quality due to streamside buffers and the selection of appropriate herbicides and application techniques.</p>	<p>Same as Alternative B.</p>
<p>Long-term impacts (>1 year)</p>	<p>The hydraulics of river flow through this reach could change without stabilizing eroded banks and decomposing gabion baskets.</p> <p>Water quality would continue to degrade due to erosion of stream banks.</p>	<p>Rock vanes and log structures would help direct flows away from stream banks, decreasing erosion, sedimentation, and turbidity in stream. Treatment of invasive plants, stabilizing banks, removal of the gabion baskets, and relocation of trail and parking area, and streamside planting would improve streamside vegetation and improve stream shading and woody debris inputs.</p> <p>Treatment of invasive plants mechanically and chemically would improve stream ecosystem function.</p>	<p>Same as Alternative B, except that streamside vegetation and future large woody debris recruitment would not be improved at the parking lot location. Increased runoff from the parking area would continue to drain almost directly to the stream channel without the benefits of an adequate streamside filter strip (buffer).</p>
<p>Issue 4: Recreation</p>			

Key Issues	Alternative A No Action	Alternative B	Alternative C
<p>Short-term impacts (<1 year)</p>	<p>Recreation associated with the river would continue, somewhat limited by eroding river banks and low habitat diversity.</p> <p>Streamside areas overgrown with invasive plants would continue to limit recreational opportunities.</p>	<p>Work would occur during peak recreation season, one to two weeks at a time, over the next several years. Precautions would be taken to minimize potential hazards through public notification, on-site signing, and lookouts.</p> <p>Turbidity during construction would reduce angling opportunities downstream.</p> <p>Following construction of in-stream structures, angling opportunities would be increased over present.</p>	<p>Same as Alternative B.</p>
<p>Long-term impacts (>1 year)</p>	<p>Recreation associated with the river would continue; somewhat limited by eroding river banks and low habitat diversity.</p> <p>Streamside areas overgrown with invasive plants would continue to limit recreational opportunities.</p>	<p>Construction of in-stream structures would increase angling opportunities and quality of experience.</p>	<p>Same as Alternative B.</p>

Chapter 3 – Environmental Consequences

This chapter forms the scientific and analytical basis for the comparison of alternatives as required by NEPA. Included in this chapter are disclosures of direct, indirect, and cumulative effects of the alternatives on resources relevant to the key issues. Direct and indirect effects occur at, or near the same time and place as a result of the action [40 CFR 1508.8 (a) and (b)]. The direct and indirect effects are combined in this chapter. Cumulative effects result “...from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such action. Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time” (40 CFR 1508.7). A list of past, present, and reasonably foreseeable projects that may have affected stream flow in the project area or may in the future is listed in Table 2.

Table 2 - Past, current, and foreseeable future management activities (anticipated in the next few years) within the analysis area, North Fork Mills River watershed.

Project	Location	Activity	Implementation Date
Private land development	Private property upstream from N. Mills River Rec. Area	Housing development	Foreseeable future
Town of Hendersonville Reservoir Dredging	Hendersonville Reservoir at confluence of Big and Fletcher Creeks	Removal of sediment from behind dam	Foreseeable future
Road Maintenance	Throughout watershed	Road maintenance – clean ditches and culvert inlets and grade roads.	Foreseeable future
Hard Mill Timber Sale	Campground	Timber Harvest	2006 – 2007
Ferrin Knob Road. FSR 5000B Storm Repair	Ferrin Knob Road, FSR 5000B at intersection with Wash Creek Road, FSR 5000	Recondition roadbed, clean and replace culverts	2005
Fletcher Creek Road, FSR 5097 Storm Repair	Fletcher Creek Road FSR 5097	Repair storm damage on Fletcher Creek Road, includes: roadbed reconditioning, slide and slump repair and culvert cleaning and replacement	2004 -2005
Mills River Road Maintenance Project	Yellow Gap Road FSR 1206, Wash Creek Road DSR 5000 & Hendersonville Reservoir Road FSR 142	Recondition roadbed, recut ditches, install new culverts and replace old culverts & pave section of Yellow Gap Road from USFS Bdry to .	2004 -2005
Wash Creek Road	Wash Creek Road FSR 5000	Clean out blocked	2004

Storm Repair	near Kramers Vista	culvert on perennial stream	
Wash Creek Horse Camp	Intersection of Wash Creek and Hendersonville Reservoir Roads on Bear Branch	Convert wildlife food plot into a horse camp.	2004
Roadside Campsite Rehabilitation	Yellow Gap Road, FSR 1206, Wash Creek Road, FSR 5000 & Hendersonville Reservoir Road, FSR 142.	Reconstruct existing road side campsites, construct new roadside campsites and obliterate existing unauthorized roadside campsites.	2003 - 2005
North Mills Timber Sale	Compartments 44 and 45	Timber Harvest, road reconstruction and new road construction.	1996 – 2000
Black Water Timber Sale	Compartment 45	Timber Harvest and road reconstruction	1996 – 1997
Wash Creek Timber Sale	Compartments 37 & 38	Timber Harvest, road reconstruction and new road construction	1989 – 1991
Seniard Ridge Timber Sale	Compartments 35 & 36	Timber Harvest, road reconstruction and new road construction	1987 -1990
Fletcher Creek #2 Timber Sale	Compartments 40 & 41	Timber Harvest, road reconstruction and new road construction	1986 – 1990
Fletcher Creek Timber Sale	Compartments 38, 39 & 40	Timber Harvest, road reconstruction and new road construction	1982 – 1985
Mills River Timber Sale	Compartments 38, 39 & 44	Timber Harvest, Road reconstruction and new road construction	1980 – 1980
Wash Creek Timber Sale	Compartments 46	Timber Harvest & road construction	1974 – 1976

Reports from different resource specialists supplied information for portions of the analysis in this chapter. The project area is the location of the proposal on the North Fork Mills River. The analysis area is the anticipated extent of effects by resource and is generally larger than the project area.

Effects analyses are disclosed by key issue in this chapter. The key issues associated with this project were identified through a public participation process, which included input from Forest Service resource specialists, other government agencies, organizations and individuals (Section 1.7.1, Chapter 1). The key issues were used to develop the proposed action. Other resources and issues (non-key issues) were disclosed in Section 1.7.2, Chapter 1.

3.1 Effects Related to Key Issue #1; Scenic Resources

Issue Statement: Removing gabion baskets, sloping back eroded banks, and design and placement of rock vanes and log structures may adversely affect scenic resources.

Indicator

- Methods of stream bank stabilization; how natural the stream will look after implementation

3.1.1 Existing Condition

The project area is located on the Pisgah Ranger District of the Pisgah National Forest on the North Fork Mills River. This reach of stream is accessed by State Road 1345 near the Pisgah National Forest entrance. Management Areas (MAs) in and immediately adjacent to, the project area include 2A, 12, and 18 (see Section 1.2, Chapter 1). Direction for managing the MAs and the Forest-wide management direction guide scenic objectives for the project area.

Management Area 2A comprises the entire project area. The project area has an emphasis on scenic quality and is assigned a Visual Quality Objective (VQO) of Retention (R) for all distance zones; therefore all activities in MA 2A are required to meet the Retention VQO. Retention provides for management activities which are not visually evident. Activities shall only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes in size, amount, intensity, direction, pattern, etc., should not be evident.

Management Area 12 includes the developed recreation area at Recreation Area. This area extends from the maintained perimeter of the recreation area to the river's edge. This MA has assigned VQOs ranging from Retention to Modification, depending on the characteristics of each site. Recreation Area is characterized as a highly developed recreation area, with a paved loop road and parking areas, a picnic shelter and restrooms. All management activities must be in character with existing structures and setting of the developed recreation site.

Management Area 18 is the riparian zone embedded within other MAs. In the project area, activities within MA 18 should not be generally a dominant feature of the landscape and are required to meet the Retention VQO.

Erosion of river banks along the reach of stream is unsightly but individually do not affect the overall VQOs established for the area since they are small and natural in appearance.

3.1.2 Alternative A – No Action

3.1.2.1 Direct and Indirect Effects

From a scenic standpoint, under this alternative, the North Fork Mills River would continue to maintain its Wild and Scenic River (WSR) eligibility status. Scenery objectives would be met in spite of the lack of repair of erosion on the river banks.

3.1.2.2 Cumulative Effects

As there are no direct or indirect effects with this alternative, there would be no cumulative effects related to Scenery management under the Forest Plan.

3.1.3 Alternative B & C – Proposed Actions

3.1.3.1 Direct and Indirect Effects

Under these alternatives, the proposed activities would improve visual attractiveness by

mitigating the unsightly erosion, removal of degrading gabion baskets, and treatment of invasive plants while meeting all Nantahala and Pisgah National Forests Land and Resource Management Plan (Forest Plan) standards for scenery management. The work and any structures would be of a design and materials, which would be compatible with the assigned VQOs. There would be short term (less than 1 year) adverse impacts on scenic quality from stabilization work. However, once vegetation is established the impacts would not be visually evident to the typical viewer.

Management activities in the North Fork Mills River must meet the “Retention” VQO, which means activities cannot be visually evident to the typical viewer, i.e. vanes must be natural appearing. Alternatives B and C meet this objective by mimicking characteristics of the surrounding natural landscape—considering design elements of form, line, color, texture and scale (Section 3.1.1). The top visible layer of each vane would use logs or weathered boulders of varying size and shape, which are similar in appearance to naturally occurring rock in the area. Boulder and log orientation and placement would appear somewhat random and natural, avoiding repetitive forms or parallel rows. To insure adherence to these criteria, a Forest Service Landscape Architect would be consulted in the final design and construction phases of this project to prevent the vanes from having an “engineered” look.

3.1.3.2 Cumulative Effects

If implemented to meet all design considerations, directions, guides, standards and objectives discussed under the effects analysis above, this alternative would have no adverse cumulative effects to scenic resources under the Forest Plan.

3.2 Effects Related to Key Issue #2; Aquatic Habitat

Issue Statement: Removing gabion baskets, sloping back eroded banks, and constructing rock vanes and log structures may adversely affect aquatic habitats.

Indicators

- Length of stream stabilized and pool habitat created
- Timing of project implementation

3.2.1 Existing Condition

Aquatic habitat in the project area consists primarily of riffle and run habitat with large cobble as the dominant substrate. Sedimentation from unstable, eroding banks is negatively affecting the substrate quality and quantity for many aquatic species, particularly fish, which need clean, sediment free substrate to live and reproduce. This erosion comes primarily from eroding unstable riverbanks during storm events. This problem is exacerbated by encroachment of roads, recreation, and wildlife features on stream banks.

In this reach of the North Fork Mills River, pool habitat most often forms in association with river meander bends, as the flow energy moves to the outside of a bend and scours the stream bottom. Because the natural meander pattern of the river within the recreation area has been reduced by straightening of the river from past management on the floodplain (e.g., farming and road building), pools make up a small percentage of aquatic habitat compared to riffle and run types. Over time, during future flooding events, the North Fork Mills River stream channel is likely to increase its length by recreating a meander pattern in reaches that are now

relatively straight. Thus, stream bank erosion and new floodplain development is anticipated over the next 50 to 100 years.

3.2.2 Alternative A – No Action

3.2.2.1 Direct & Indirect Effects

Under this alternative, channel stabilization actions would not occur. Erosion of the river's stream banks would continue to contribute sediment to the North Fork Mills River, negatively affecting aquatic habitat. Additionally, pool habitat would remain at the current low level or decrease further with continued sedimentation.

3.2.2.2 Cumulative Effects

This alternative would allow continued gradual adjustment of the river channel to a more natural meander pattern. However, due to past modifications of the channel, and recreational and other development, unchecked river adjustment could result in extensive erosion and damage to existing facilities.

Other activities that are likely to occur on public lands in the watershed, e.g., Hard Mill Timber Sale in the Campground, road maintenance, and dredging of the Hendersonville Reservoir, have potential to increase sediment delivery to streams. These activities would be designed to minimize exposure and displacement of soil and sediment to streams by using BMPs designed for those projects. The proposed land development on private land has the potential to increase storm water runoff and erosion, and subsequently increase erosion and sedimentation in the project reach. This alternative would add to the potential adverse effects of this activity.

3.2.3 Alternative B & C – Proposed Actions

3.2.3.1 Direct & Indirect Effects

In-stream sedimentation beyond background levels can reduce habitat quality and quantity for many aquatic species. This is true for all fish species but particularly trout. Adult trout need clean, sediment free, gravel sized substrate for spawning; eggs need this clean substrate for hatching. Without successful spawning, trout populations become unstable and suppressed within as little as two years. Both Alternatives B and C would reduce sedimentation and have a positive effect on trout and on most aquatic species. For further trout protection, in-stream structures would be built outside the North Carolina Wildlife Resources Commission's designated trout spawning moratorium of October 15 through April 15.

Both alternatives would have positive impacts on riparian areas and floodplains within the project area. Riparian areas and floodplains are critical for nutrient input (leaf material) and shade for aquatic organisms. Both alternative would address those needs by restoring streamside vegetation and placing in-stream structures that aquatic species could use as habitat. Rock and log vanes would reestablish pools, which are currently lacking within this stretch of river. Alternative C would be less effective at restoring riparian function since it would not restore an adequate streamside zone to filter runoff and provide future woody debris recruitment at the parking area.

In the short term, there would be displacement of sediment causing a temporary fluctuation of turbidity during installation of in-stream structures. This displacement is expected to last less than a week for each of the next 2 to three years while work is being accomplished.

Long-term benefits of stabilizing stream banks and reducing chronic sediment pulses are expected to more than offset these short-term impacts.

3.2.3.2 Cumulative Effects

Alternatives B and C would facilitate the improvement of habitat for aquatic species, since the actions would reduce erosion and sedimentation and add to pool habitat. Past activities have left a legacy of effects, such as confined channels lacking adequate pool habitat, future activities have a higher risk of having adverse cumulative effects, which makes the proposed activities even more important.

The proposed land development on private land has the potential to increase storm water runoff and erosion, and subsequently increase erosion and sedimentation in the project reach. The construction of proposed stream structures would help to stabilize erosion prone areas and help mitigate potential increases in streamflow from the private development. The contribution of sediment from banks of the North Fork Mills River would be reduced as a result of the placement of the vanes, improving aquatic habitat downstream. The cumulative effects of this alternative would add to the aquatic habitat beneficial effects in the river system.

3.3 Effects Related to Key Issue #3; Hydraulics/Water Quality

Issue Statement – Removing gabion baskets, sloping back eroded banks, and constructing rock vanes and log structures may alter the hydraulics of the North Fork Mills River and increase potential for sediment delivery. Treating invasive plants near streams may affect water quality.

Indicator

- Length of stream stabilized
- Area treated for invasive plants

3.3.1 Existing Condition

The current stream flow regime of the North Fork Mills River is modified by the presence of roads and other compacted areas in the watershed. Such changes to the landscape often result in increased runoff of water and sediment during storm events. Stream flow modifications are likely to increase with storm flow magnitude and result in quicker storm flow peaks.

This reach of North Fork Mills River is a channel with partially reduced access to its normal floodplain with a moderate rate of bank erosion. As a result, flood flows are contained in sections of channel and bank erosion continues due to excessive flow energy. The upper section of the reach is predominantly a transport reach where stream substrate is efficiently transported through the reach. Downstream, at about the middle of the reach, the channel does have access to much of its floodplain and flow energy is dissipated during floods. In this section, the transported material from the upstream reach is deposited on the channel bottom, causing several side and high flow channels. Much of the vegetation on the floodplain area has been altered from desired condition due to invasive plants.

The State of North Carolina, Department of Environment and Natural Resources designates protected water uses (or best uses) for all state waters, including those in the North Fork Mills River drainage. These include aquatic life propagation and maintenance of biological integrity, wildlife, primary recreation (swimming on a frequent basis), agriculture, and domestic water supply. In addition to these protected water uses, water quality in the North Fork Mills River should sustain and allow for trout reproduction and survival of stocked trout on a year-round basis.

The North Fork Mills River is not listed as “water quality limited” by the N.C. Department of Environment and Natural Resources, Division of Water Quality (NCDENR 2003a) as of the latest 303(d) listing of stream channels impaired from meeting State water quality standards. All protected water uses are currently identified as “supported” at some level. The Division of Water Quality (NCDENR 2003b) Basinwide Assessment Report for the French Broad River Basin reported an excellent rating for benthic macroinvertebrates in the North Fork Mills River. These classifications only reflect chemical pollutants and do not address sediment. Although the data does not make clear the current condition of the North Fork Mills River relative to sediment impacts, it is apparent that erosion at the proposed project sites does not meet the desired conditions in a riparian area.

3.3.2 Alternative A – No-action

3.3.2.1 Direct & Indirect Effects

Under this alternative, channel stabilization actions would not occur. Erosion of the river’s stream banks would continue to contribute sediment to the North Fork Mills River, negatively affecting water quality. Under Alternative A, the current rate of bank erosion is expected to continue or increase due to unstable bank conditions. A slight increase in the current rate of erosion could occur as the undercut trees on the bank fall over and expose more soil, putting water quality at risk. The picnic area would be more vulnerable to erosion, ultimately resulting in expensive damage to a heavily used recreation facility. Continued undercutting of the stream bank near the parking area could cause expensive damage and disruption of recreational activity.

3.3.2.2 Cumulative Effects

The No Action Alternative would allow the continued gradual adjustment of the river channel to a more natural meander pattern. However, due to past modifications of the channel, and recreational and other development, unchecked river adjustment could result in extensive erosion and damage to existing facilities.

Other activities that are likely to occur on public lands in the watershed, e.g., Hard Mill Timber Sale in the North Mills River Campground, road maintenance, and dredging of the Hendersonville Reservoir, have the potential to increase sediment delivery to streams. These activities would be designed to minimize exposure and displacement of soil and sediment to streams by using Best Management Practices designed for those projects. The proposed land development on private land has the potential to increase storm water runoff and erosion, and subsequently increase erosion and sedimentation in the project reach. The No Action Alternative would add to the potential adverse effects of this activity.

3.3.3 Alternative B & C– Proposed Actions

3.3.3.1 Direct & Indirect Effects

Alternative B and C would have direct short-term (≤ 1 year) negative effects on turbidity and fine sediment mobilization, but positive, indirect effects on hydrology and water quality of the North Fork Mills River in the long term. Alternative C would be less effective at restoring water quality than Alternative B since it would not restore an adequate streamside zone to filter runoff from the existing parking area.

Under both alternatives, constructed structures would redirect river flow away from stream banks, where it is causing erosion at high stream flows, and back into the middle of the channel. Riverbanks would be sloped back to a stable angle upstream and downstream of each vane where practical. River banks would be seeded, mulched, and planted with native riparian vegetation.

Vane structures would be installed to work with the existing streambed form of the channel. Therefore, location of the vanes would generally coincide with existing riffle and pool habitats. Much of the bed material removed from the channel during construction would be placed on the upstream side of the vanes against the stream bank to enhance the deposition that would naturally occur there. The areas along the bank, both upstream and downstream of the vanes, would fill in after construction as deposition occurs over the years. By doing so, the channel would narrow and generally improve water quality and aquatic habitat. A narrower channel would be deeper and less prone to water temperature warming. Pools and riffles would be well defined and of better quality than currently at the site.

The vanes are not likely to increase peak flow levels or the risk of flooding since they are designed to increase channel efficiency. Following construction of the vanes, the wetted channel width is expected to narrow by approximately 10 feet on average and deepen by about 0.2 feet. As a result, stream flow velocity is expected to increase slightly through the reach. Based on the general USGS safety standard (depth x velocity less than six) the summertime average flows would be safe for wading. The need for public river safety education would not increase with this alternative.

Additionally, the proposed vanes and the associated bank work would help stabilize the North Fork Mills River channel. Stabilizing the bank would reduce the existing chronic source of sediment, improve aquatic habitat, and establish riparian vegetation. A short-term pulse of sediment created from the construction of the vanes is expected but would be outweighed by the long-term benefit of a stable stream channel. Implementation of Forest Plan standards and guidelines requiring erosion control while working in riparian areas would further reduce sediment input.

Alternatives B and C would treat all floodplain areas for non-native invasive plants, a total of approximately 15 acres of area. This activity would include cutting plants by hand and machine, the use of herbicide, and planting of trees and shrubs where appropriate. Machines would be kept out of water and wet soils where hand techniques would be implemented. To protect water quality during herbicide application, direct application methods, such as direct application to a cut stump using a brush, would be used within 50 feet of water. Beyond this streamside zone, basal spraying (thin line method) of herbicides would be allowed. Herbicides would be used that have a low mobility and persistence, and would be applied in

a controlled manner only in areas that require it. Additionally, herbicide would not be applied on windy days or before a predicted rainstorm. Therefore, no adverse effects to water quality are expected from the application of herbicides in both alternatives.

3.3.3.2 Cumulative Effects

Since these alternatives would have positive direct and indirect effects on hydrology and water quality of North Fork Mills River, they are expected to have beneficial cumulative effects, particularly on the sediment regime.

Alternative B and C would facilitate the improvement of hydrology and water quality, since the action would reduce erosion and sedimentation and add to pool habitat. Past activities have left a legacy of effects, such as confined channels lacking adequate pool habitat, future activities have a higher risk of having adverse cumulative effects, which makes the proposed activities even more important.

The proposed land development on private land has the potential to increase storm water runoff and erosion, and subsequently increase erosion and sedimentation in the project reach. The construction of proposed stream structures would help to stabilize erosion prone areas and help mitigate potential increases in streamflow from the private development. The contribution of sediment to the North Fork Mills River would be reduced as a result of the placement of the vanes, improving aquatic habitat downstream. The cumulative effects of both of these alternatives would add to the aquatic habitat beneficial effects in the river system.

3.4 Effects Related to Key Issue #4; Recreation

Issue Statement: Placing rock vanes may negatively impact recreational users, especially fishermen.

Indicator

- Ability of recreationists to use the river after construction, particularly fishermen.

3.4.1 Existing Condition

Recreational Use

Parts of the North Fork Mills River are classified as Roaded Natural 1 (RN 1) in the Recreation Opportunity Spectrum (ROS). Roaded Natural 1 areas have a natural-appearing environment with evidence of the sights and sounds of people and are within ½ mile of improved roads. Opportunities to interact with nature exist but encounters with other users are common.

Recreational uses in the project area includes camping, picnicking, wading, swimming, tubing, fishing, and walking for exercise. Currently, there are campsites, picnic sites, paved roads, trails, shelters and restrooms in the highly developed Recreation Area. These facilities along with the North Fork Mills River attract high public recreation use during the summer with the river being the place where many of these visitors are attracted and focus their play.

A safe river environment, including access to the river, is important to visitors as they wade, fish, swim, tube or just walk the banks and enjoy the sights and sounds of the river.

Wild and Scenic River Status

The North Fork Mills River is very scenic with clear waters, large boulders and outcrops, and cobble dominated substrate. These outstanding values, including its popularity with recreationists, earned the North Fork Mills River consideration as “eligible” for Wild and Scenic River (WSR) (Forest Plan Amendment 5, pg. III-11 and III-14). Forest Plan direction provides interim WSR protection for the North Fork Mills River until designated or formally released from further study (Forest Plan Amendment 5, pg. III-11) to maintain the potential for WSR classification. The river must be maintained in a free-flowing condition, but minor fish habitat structures, such as log deflectors and boulder placement like that proposed in Alternative B and C, are allowed (Forest Plan Amendment 5, pg. III-15).

3.4.2 Alternative A – No Action

3.4.2.1 Direct & Indirect Effects

Alternative A, would maintain North Fork Mills River as eligibility as a WSR. However, some qualities that contribute to its eligibility as a WSR would decline. The safety of the river environment would continue to decline.

3.4.2.2 Cumulative Effects

Cumulative effects would be similar to the direct and indirect effects.

3.4.3 Alternative B & C – Proposed Actions

3.4.3.1 Direct & Indirect Effects

With Alternative B, the proposed activities would improve site conditions, safety, and user experience while meeting all Nantahala and Pisgah National Forests Land and Resource Management Plan (Forest Plan) standards for recreation management. The North Fork Mills River would maintain, and even slightly enhance, its eligibility as a WSR. Proposed naturally appearing vanes allow the river to maintain its “free-flowing” condition but redirect flow to the channel center and allow the reestablishment of vegetation.

Short-term hazards to the public would exist during construction activities. However, safety precautions are designed into the project to mitigate public safety hazards.

3.4.3.2 Cumulative Effects

Cumulative effects would be similar to the direct and indirect effects.

3.5 Other Resource Concerns

Threatened, Endangered and Sensitive Species

3.5.1 Existing Condition

Aquatic habitat within these stretches of the North Fork Mills River primarily consists of riffles with large cobble as the dominate substrate. Portions of the river bank are eroded or have recently failed with very little vegetation stabilizing them.

Aquatic habitat within affected reaches of the North Fork Mills River primarily consists of riffles with large cobble as the dominate substrate. The activity area is heavily disturbed because of high recreational usage. Portions of the river bank are eroded or have recently failed and have very little vegetation stabilizing them. The gabion baskets, which are proposed for removal, have been damaged and are currently hazardous to recreationists.

The proposed activity area is currently managed by the NC Wildlife Resources Commission under *Delayed Harvest* fishing regulations, which means it is stocked with catchable-sized trout (*Oncorhynchus mykiss*, *Salmo trutta*, and *Salvelinus fontinalis*) to provide both catch-and release and harvest opportunities for trout anglers. Other non-game fish inhabit these riffles which include: *Etheostoma blennioides*, *Rhinichthys atratulus*, *Rhinichthys cataractae*, *Catostomus commersoni*, *Hypentelium nigricans*, *Etheostoma flabellare*, *Notropis spectrunculus*, *Ambloplites rupestris*, and *Cottus bairdi*.

The proposed activity area is dominated by Acidic Cove Forest (Schafale & Weakley 1990). This community type is very common within the Southern Appalachians. Generally, this community type has a low association with rare plants. Few rare species have been documented within this area of the Pisgah Ranger District. Proposed, endangered, and threatened (PET) species considered in this analysis are those currently listed by the U.S. Fish and Wildlife Service. Sensitive (S) species are those listed by the Regional Forester in 2001. Potentially affected species were identified by the following methods:

- (1) Reviewing the list of TES species on the Nantahala and Pisgah National Forests and their habitat preferences;
- (2) Consulting element occurrence records of TES species maintained by the North Carolina Natural Heritage Program (NCNHP), the U.S. Fish and Wildlife Service (USFWS), and the North Carolina Wildlife Commission (NCWRC);
- (3) Consulting with individuals both in the public and private sector who are knowledgeable of the area and/or TES species habitat characteristics; and,
- (4) Conducting field surveys for TES species in areas designated for ground disturbing activities. Proposed activity areas were surveyed by David Danley, National Forests in NC botanist, for rare plant species or the presence of special habitats (such as wetlands, boulder fields, caves or mines) that could be adversely affected by project activities. No special habitats were located. A wildlife habitat and species evaluation was conducted by Dennis Danner, USFS Wildlife Biologist. USFS Fisheries Biologists Sheryl Bryan and Lorie Stroup surveyed and evaluated the project area for rare aquatic species. Multiple years of aquatic species data were referenced as well.

A description of the process of species evaluation and the rationale to select potentially affected rare species follows for each of the three biological disciplines.

Aquatic Resources

All aquatic animal species that might occur on the Pisgah National Forest were initially considered. One federally listed and two sensitive aquatic species have been listed by NCWRC, USFWS, or NCNHP as occurring or potentially occurring in Henderson County. All of these species were eliminated from further analysis based on either analysis area surveys or recent project area surveys conducted by the USFS and/or the NCWRC.

Freshwater mussels, Appalachian elktoe (*Alasmidonta raveneliana*, E) and Tennessee heelsplitter (*Lasmigona holstonia*, S) are currently known from the main stem of the Mills River. *L. holstonia* is also known from the lower South Mills River, several miles

downstream of Forest Service ownership, within this area of Henderson County (NCNHP 2003 records). Additionally, relict shells of slippershell mussel (*Alasmidonta viridis*, FC) have been documented in the mainstem of the Mills River, several miles downstream of the project area (Mills River survey for Mussels and Fish, Layzer and Madison 1995). Annual surveys for freshwater mussels are conducted within the Mills River watershed as a cooperative venture between the USFS, Tennessee Valley Authority, Henderson Co. Soil and Water and Land of Sky Conservation Group.

There is suitable habitat for the French Broad River crayfish (*Cambarus reburus*, S) within the analysis area for this project. Within the Pisgah Ranger District, the species was historically located from the mainstem of the Davidson River downstream of the Sycamore Flats Recreation Area; however, it has not been found there in over 50 years, despite extensive work on range of the species. The species was found in the upper Davidson River in 1993. Other records of *C. reburus* on or adjacent to the Pisgah Ranger District include the West Fork French Broad River, which is significantly upstream of this aquatic analysis area). Despite extensive surveys across the potential range of the species over the last decade, there are no records of *C. reburus* within the Mills River drainage.

There will be no direct, indirect, or cumulative effects to these three species since they do not or are not likely to occur within aquatic biological analysis area. Therefore, these species will not be analyzed further in this document.

Botanical Resources

Previous botanical surveys within this area of the forest have not located any federally-listed or sensitive plant species. Field surveys during the spring and late summer of 2005 did not locate any populations of, or any suitable habitat for, any federally-listed or sensitive plant species within the analysis area. A site specific survey was conducted in February of 2007 for habitat and no special habitat was located for rare botanical species. This project is located within an “acidic cove-hardwood” habitat type which is generally associated with a low probability of rare plant occurrences. There will be no direct, indirect, or cumulative effects to any plant species with implementation of this proposed watershed restoration project.

Wildlife Resources

One federally listed and six sensitive terrestrial animal species that might occur on the Pisgah National Forest in Henderson County were initially considered for analysis for the proposed project. All six sensitive species were dropped based on habitat requirements, surveys, and information from the North Carolina Wildlife Resources Commission (NCWRC), North Carolina Natural Heritage Program (NCNHP), and the US Fish and Wildlife Service (USFWS).

The affected land area is a relatively small section of riparian habitat along the North Fork Mills River. The bog turtle (*Glyptemys muhlenbergii*) is the only rare species carried forward for further analysis of effects. It is federally-listed as Threatened (because of similarity of appearance), and is also listed as Threatened by the State of North Carolina.

Allen Ratzlaff and Carolyn Wells (USFWS biologists), and Lori Williams (NCWRC wildlife diversity biologist) were contacted on March 12, 2007 to obtain the most current information regarding bog turtle habitat and species occurrence in or near the project area.

There is a 1983 record for this species approximately two miles east of the project area in an agricultural field where suitable habitat is no longer present. However, the eastern edge of the project area does contain a beaver created, marshy bog that is suitable bog turtle habitat. Recent trapping efforts within this habitat in 2006 failed to collect any bog turtles (Lori Williams, personal communication), but the species could easily be present there.

Table 3 - Known and potential TES species evaluated for this project.

Bog Turtle (<i>Glyptemys muhlenbergii</i>)	Reptile	Wet, boggy areas	May occur
---	---------	------------------	-----------

3.5.2 Alternative A – No Action

3.5.2.1 Direct, Indirect & Cumulative Effects to Wildlife Resources

The no-action alternative would have no affect on any federally listed species since no TE species or their associated habitats occur within the project area at this time based on preferred habitat elements and survey results.

Implementation of the no-action alternative would perpetuate the existing condition within the North Fork Mills River and could impact bog burtle (*Glyptemys muhlenbergii*) habitat. The negative impact of canopy closure would continue if exotic invasive species are not treated within the area.

Also, there could be an increase in the current rate of erosion could occur as the undercut trees on the bank fall over and expose more soil, the stream could become more incised, and adverse effects to channel integrity would continue and water quality would be at risk. Aquatic habitat quality directly downstream of these sites would continue to be degraded.

3.5.3 Alternative B & C – Proposed Actions

3.5.3.1 Direct, Indirect & Cumulative Effects by Wildlife Species

Bog Turtle (*Glyptemys muhlenbergii*)

Direct and Indirect effects –The stream bank restoration activities will have no effect on the bog habitat within the project area. However, the treatment of noxious, non-native invasive plants has the potential for slight improvement of the habitat by opening the canopy above it.

Cumulative Effects of Past, Ongoing, and Future Projects – Bog turtle habitat on nearby private lands (downstream of the activity area) has been diminished due to agricultural development. Ongoing activities associated with agriculture including the use of fertilizers and pesticide could be impacting water quality within the drainage, and therefore the water quality of the analysis area containing the bog turtle.

The Hendersonville Reservoir is located upstream of the wildlife analysis area. Dredging of this water supply reservoir has been evaluated as a “future or reasonably foreseeable project” within the area on National Forest. This project will have no impact on the bog turtle habitat within the North Fork Mills River Stream Restoration Project area. Another project that has been considered as foreseeable is the development of the 84-acre inholding of private lands immediately upstream of the project area. There is a proposal to develop this property with residential homes (several within the riparian area of North Fork Mills River and Rocky Fork). This development has the potential to impact water quality within the North Fork Mills River watershed and therefore could impact the water quality of habitat for the bog turtle.

Determination of Effect – Although the bog turtle has not been collected within the proposed project area, the presence of suitable habitat and the proximity of the 1983 record of occurrence make it highly probable that the species is present within the site. The stream bank restoration activities will have no effect on the bog habitat within the project area. However, the treatment of noxious, non-native invasive plants has the potential for slight improvement of the habitat by opening the canopy above it. Consequently, the project **may affect, but is not likely to adversely affect** this species. No consultation is required on species listed due to similarity of appearance.

Proposed, Endangered, Threatened, and Sensitive Species Determination of Effects

The North Fork Mills River Stream Restoration Project will have **no effect** on any proposed, endangered, threatened, or sensitive (PETS) aquatic or plant species since none are known or likely to occur within the aquatic analysis area.

This project is **may affect, but is not likely to adversely affect** the bog turtle (*Glyptemys muhlenbergii*) because habitat for the species will be improved by the implementation of this project. No consultation is required on species listed due to similarity of appearance.

Forest Concern Species

3.5.4 Existing Condition

The Nantahala and Pisgah National Forests list of Forest Concern species includes 262 plants, 56 terrestrial animals, and 87 aquatic animals. These species either are known or could occur on the Forests. All of these species were initially considered for this analysis. The following discussion analyzes each of the three biological resources.

Botanical Resources

All Forest Concern plant species for the Pisgah and Nantahala National Forests have been considered for the North Fork Mills River Enhancement Project. Numerous field surveys did not locate any of these forest concern species. Many of these species previously documented in other portions of the Forest occur in habitats, such as Spruce-Fir Forest, Spray Cliffs, rock outcrop communities, or Southern Appalachian Bogs, that will not be affected by project activities. Previous surveys within this area of the forest by David Danley have not located any rare plant species or rare habitat types. The predominate habitat type is acidic cove

hardwoods which generally does not support rare species. There will be no direct, indirect, or cumulative effects to any Forest Concern plant species with implementation of this proposed channel improvement project.

Wildlife Resources

All Forest Concern terrestrial animal species that might occur on the Pisgah and Nantahala National Forests were initially considered for analysis for the proposed project. These were listed by the North Carolina Wildlife Resources Commission (NCWRC), North Carolina Natural Heritage Program (NCNHP), and the US Fish and Wildlife Service (USFWS) as occurring or probably occurring in Henderson County. Most of these species occur within high elevation forests or openings, in Southern Appalachian Bogs, in vernal pools or woodland pools, or in wet rock outcrops. None of these habitats are present within the two proposed activity areas. Previous surveys by the former wildlife biologist on the Pisgah Ranger District, Chris Kelly, and project specific surveys by the current Pisgah District Wildlife Biologist did not locate any rare species. Thus, the proposed river stabilization project will have no direct, indirect, or cumulative effects to any Forest Concern terrestrial wildlife species.

Aquatic Resources

All Forest Concern aquatic animal species that might occur on the Pisgah National Forest were initially considered. Sixteen species have been listed by NCWRC or NCNHP as occurring or potentially occurring in Henderson County. Surveys are conducted each year at the North Mills Recreation Area in cooperation with the Tennessee Valley Authority and Henderson County Soil and Water for aquatic species within the North Fork Mills River project. A district evaluation of hellbenders and their habitat from 2005 and 2006 only located habitat for hellbenders (*Cryptobranchus alleghaniensis*). Hellbenders are historically known to occur in the project area though no hellbenders were found during recent surveys; it is likely that they avoid the area due to the high recreation use particularly during their fall breeding season. Thus, the species is not expected to occur within or downstream of the activity area.

Since habitat for this species was found in the project area, the effects of the project on hellbenders will be analyzed (Table 4).

Table 4 - Habitat for Forest Concern rare species likely to occur within the activity areas affected by the North Fork Mills River stabilization project.

Forest Concern Species	Type	Habitat	Occurrence
<i>Cryptobranchus alleghaniensis</i> (Hellbender)	Amphibian	Large and clear fast flowing streams	Known to occur

3.5.5 Alternative A – No Action

3.5.5.1 Direct, Indirect & Cumulative Effects- Hellbender (*Cryptobranchus alleghaniensis*)

With the no-action alternative, there will be no activities to stabilize the North Fork Mills River. The channel will continue to be unstable and sediment could reach the North Fork Mills River during storm events. If any individual hellbenders are present, they could be indirectly affected by loss of suitable habitat. Suitable habitat for these species will not be increased with the no-action alternative.

3.5.6 Alternative B – Proposed Action

3.5.6.1 Direct & Indirect Effects- Hellbender (*Cryptobranchus alleghaniensis*)

Hellbenders prefer rocky, clear creeks and rivers where there are submerged logs or rock shelters present. This species could be present within North Fork Mills River activity areas. If individuals of this species are present within the activity area, they could be crushed by the heavy equipment necessary to construct the rock vanes and place downed woody debris. In order to diminish any negative impacts to the population within the North Fork Mills River , on the day prior to construction a river survey will be completed in order to collect and move any individuals upstream away from the disturbance. If any hellbenders exist and are found during surveys, the collection and movement may stress a few individuals and could result in a death, however it is expected the vast majority will survive the relocation.

The stabilization of the existing sedimentation problem along the North Fork Mills River will indirectly affect hellbender by improving suitable habitat for this species. The placement of the rocks and woody debris should provide more habitat for egg rearing nests under the flat rocks and submerged logs.

3.5.6.2 Cumulative Effects- Hellbender (*Cryptobranchus alleghaniensis*)

The existing condition of the aquatic resource is the result of all past and on-going activities. Channelization of the North Fork Mills River, and the development of the recreation site are existing impacts that have contributed to negative impacts to the species. Recreationists influence various segments of the North Fork Mills River and it is reasonable to assume hellbenders are moving up or down stream to avoid human contact. The proposed activities should cumulatively add to the increase in suitable habitat for hellbenders.

Determination of Effect – Hellbenders are known from 17 counties within western North Carolina. This widely distributed species has 14 populations occurring in streams adjacent to

USFS lands. Both Transylvania and Graham Counties have the greatest concentration of documented hellbender populations.

The proposed activities may have minimal impact to individuals since hellbenders will be collected and relocated upstream prior to project implementation. The project will improve suitable habitat for this species within the North Fork Mills River. This project may impact individuals of this species but the negative effects to potential habitat will be very minor considering the habitat present for this species within this watershed and across the Forest (Table 4).

Forest Concern Species Determination of Effects

The North Fork Mills River channel stabilization project may impact individuals of *Cryptobranchus alleghaniensi*, but will not reduce the stability of populations within this area of the Pisgah Ranger District. Any impacts will be greatly reduced since individual hellbenders will be collected and placed upstream prior to project implementation. There will be a cumulative improvement of suitable habitat for this species with implementation of the project. This project will not impact any other Forest Concern species.

3.6.1 Introduction & Existing Condition

Management Indicator Species (MIS) serve as the system to monitor Forest Plan implementation and effects on diversity and population viability of all native and desirable non-native plants and animals. At the project scale, MIS are used to focus the effects of proposed activities on habitat types. When these effects are evaluated within a forest wide context, it is determined whether any trends for MIS would change. An assessment of habitat changes linked to management indicator species (MIS) is documented in this section. The assessment provides an evaluation of project level activities, the change in habitat used by MIS, and the likely contribution to forest wide trends.

The amount of habitat changed by the project is checked for consistency with the Forest Plan and the recent trends in activities. If any inconsistencies are uncovered, then further investigation should be made to determine effects on MIS. However, if the project activities are consistent with recent trends, then effects of habitat changes to MIS should remain constant. Tables 5 and 6 list each MIS species and the biological communities and special habitats they are indicating. For the North Fork Mills River channel stabilization project, five separate species were selected to represent the two habitats that potentially could be impacted. Acadian flycatchers will represent riparian forests. Brook, brown, and rainbow trout and blacknose dace represent the coldwater stream component for the Nantahala and Pisgah National Forest. Within this area of the North Fork Mills River, rainbow trout is the predominant species with lesser amounts of brown trout. Both species have their populations enhanced by hatchery inputs for this delayed harvest section, although both are able to reproduce to a limited extent within this length of the North Fork Mills River.

Communities and Special Habitats Effects

Most of the biological communities and special habitats in the project area are not affected by management activities proposed by the preferred alternative. What changes that are anticipated to occur, and discussed above, are consistent with the Nantahala and Pisgah Forest Plan. Most of the projected habitat changes are needed to accomplish the multiple-use

goals of the Plan. The cumulative effect of the implementation of this project, along with other similar projects, would change habitats in amounts close to/consistent with forest-wide averages of the recent past. Therefore, population trends of MIS related to habitat changes on the Forest would continue as cited in the most recent update of the MIS assessment.

Coldwater Streams

There are approximately 5100 miles of coldwater stream on the Nantahala and Pisgah National Forests. Implementation of the proposed project will be affecting less than 0.2 mile length of these streams. For cold-water streams, the forest-wide trend is increasing quality, due to improved efforts at erosion control and a reduction in new road construction. The proposed project will add to this trend but will not significantly change the forest-wide trend considering the minor amount of stream reach (<0.01% of the forest-wide streams) the project will affect.

Riparian Forests

Riparian forests are protected by standards in the Pisgah and Nantahala National Forest Land and Resource Management Plan. These forests, approximately 95,000 acres in extent, currently are static, i.e. they are not expanding or being reduced in extent. As a result, there is no reduction in the quantity of habitat and a gradual increase in quality as the forests are aging and developing more characteristics of high-quality riparian forests and only activities that enhance riparian benefits are permitted forest-wide. The current project will negatively impact riparian forest within the access routes. The amount of impact will be less than 0.1 acre and will not significantly modify the gradual increase in quality for riparian forests across the Nantahala and Pisgah National Forest.

Table 5 - Biological communities and associated MIS (using Forest Plan EIS, Table III-8).

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	Brook, brown, and rainbow trout; blacknose dace	Yes
Coolwater streams	Smallmouth bass	No/1
Warmwater streams	Smallmouth bass	No/1

*1 Biological community and its represented species do not occur in the project area; therefore, this biological community will not be affected. Given no effects to the community, the action alternative will not cause changes to forest-wide trends or changes in population trends of species associated with this community.

Table 6 - Special Habitats and associated MIS (using Forest Plan EIS, Table III-9).

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/1
Permanent grass/forb openings	White-tailed deer	No/2
Downed woody debris	Ruffed Grouse	No/1
Snags	Pileated woodpecker	No/1

*1 Biological community and its represented species do not occur in the project area; therefore, this biological community will not be affected. Given no effects to the community, the action alternative will not cause changes to forest-wide trends or changes in population trends of species associated with this community.

*2 Special Habitat and its represented species will be protected in accordance with Forest Plan standards and guidelines (open road density will not change, snags, and den trees will be retained); therefore, this special habitat will not be affected by any of the alternatives. Given no effects to the habitat, this project will not cause changes to forest-wide trends or changes in population trends of species associated with this habitat.

Table 7 - Biological communities and special habitats, and estimated change in each alternative.

Biological Community	No Action	Action Alternatives
Fraser fir forests	None affected.	None affected.
Northern hardwood forests	None affected.	None affected.
Carolina hemlock bluff forests	None affected.	None affected.
Rich cove forests	None affected.	None affected.
Yellow pine successional communities	None affected.	None affected.
Reservoirs	None affected.	None affected.
Riparian forests	None affected.	Minor affect, < 0.1 acre
Cold water streams	Short and long-term affects, ~ 0.2 stream mile	Short and long-term affects, ~ 0.5 stream mile
Warm water streams	None affected.	None affected.
Special Habitats		
Old forest communities (100+ years old)	None affected.	None affected.
Early successional communities (0-10 yr)	None affected.	None affected.
Early successional communities (11-20 yr)	None affected.	None affected.
Soft mast-producing species	None affected.	None affected.
Hard mast-producing species (>40 yr)	None affected.	None affected.
Contiguous areas with low disturbance (< 1 mi. open road / 4 sq. miles)	None affected.	None affected.
Large contiguous forest	None affected.	None affected.
Permanent grass/forb openings	None affected.	None affected.
Snags and dens (>22" dbh)	None affected.	None affected.
Down woody material	None affected.	None affected.

Species Evaluated and Rationale

The proposed project is channel stabilization bank improvement work on the North Fork Mills River. All management indicator species whose habitat is potentially affected by project activities were evaluated (see Tables 5-7). This includes the brook, brown, and rainbow trout, blacknose dace, and Acadian flycatcher. Information about forest-wide MIS habitats and population trends is contained in the Forest MIS report, “**Management Indicator Species Habitat and Population Trends**”, which is available for review by contacting the National Forest Office.

3.6.2 Alternative A – No Action

3.6.2.1 Direct, Indirect & Cumulative Effects by MIS Species

1) Acadian Flycatcher (*Empidonax virescens*)

The no-action alternative will have no direct or indirect impact on Acadian flycatcher since potential habitat for this species within the forest adjacent to the North Fork Mills River will not change. There will be no cumulative effect with implementation of the activities associated with project.

2) Rainbow Trout (*Oncorhynchus mykiss*), Brown Trout (*Salmo trutta*), and Blacknose Dace (*Rhinichthys atratulus*)

With the no-action alternative, there will be no activities to stabilize the existing eroding stream banks. Given the lack of any stream bank restoration, the three aquatic species occurring downstream of the proposed activity areas would continue to be directly impacted by periodic sedimentation following rain events. The greater turbidity and sediment loading could result in negative affects to all three species by injuring and stressing individuals or smothering eggs and juveniles. Available habitat, including the interstitial space within the substrate used as spawning and rearing areas, may be covered with sediments. Thus, suitable habitat for these species will not be increased with the no-action alternative. The chronic long-term affects of sedimentation may lead to localized extirpation of subpopulations.

3.6.3 Alternative B – Proposed Action

3.6.3.1 Direct, Indirect& Cumulative Effects by MIS Species

1) Acadian Flycatcher (*Empidonax virescens*)

The proposed watershed improvement activity area is dominated by riparian vegetation and Acidic Cove Forest. Direct impacts to any canopy trees will be primarily limited to this area since the adjacent forest within the North Fork Mills Recreation Area is already heavily disturbed and partially open. It is conceivable that Acadian flycatcher individuals may occur within the activity area on or adjacent to the North Fork Mills River recreation site. If eggs are present within the nest, there could be a direct affect on potential recruitment. If the species is nesting within some of the trees that may have to be removed to access the streams, there could be an indirect affect in loss of habitat for the species.

Forest riparian regulations have reduced any negative impacts to Acadian flycatcher from past and on-going projects within the Bent Creek watershed. Habitat has been lost in the past with the previous timber sale due to road construction activities. Disturbance from past storm events during the mid 1990's may have affected scattered riparian canopy trees and indirectly affected this species. Future projects within the watershed should not affect this species on public land. The cumulative negative impact to Acadian flycatcher from the proposed project should be minimal and localized primarily to the activity area. While the project may impact a small amount of habitat for Acadian flycatcher along a small portion of the riparian forests for the North Fork Mills River, this small potential impact in habitat loss will not change the overall static population trend for Acadian flycatcher across the Forest.

2) Rainbow Trout (*Oncorhynchus mykiss*), Brown Trout (*Salmo trutta*), and Blacknose Dace (*Rhinichthys atratulus*)

All three species are known from this segment of the river and could be affected by project activities within the activity areas. Management most likely to impact suitable habitat for this species would be ground disturbing activities such as the re-contouring of the river banks and construction of the rock vanes.

This disturbance within the stream or on the stream bank could result in direct short term (< 1 year) impacts by smothering fish eggs and/or juveniles result in a short term impact. Adults of all three species should be unaffected by the project since they have the ability to swim away from the disturbance area. Long term benefits of stabilizing the existing erosion

problems within the two activity areas should indirectly enhance suitable habitat for all three species within this reach of the North Fork Mills River.

The existing condition of the aquatic resource is the result of all past and on-going activities. The Hendersonville Reservoir is located upstream of the wildlife analysis area. Dredging of this water supply reservoir has been evaluated as a “future or reasonably foreseeable project” within the area on National Forest. Episodic fluctuations in sediment could occur during the dredging process that could impact this section of the North Fork Mills River. Visual sediment will be monitored during the dredging process so that it does not exceed an acceptable level as determined by the NC Division of Water Quality. This project will have no long term impact on the trout habitat within the North Fork Mills River Stream Restoration Project area. Another project that has been considered as foreseeable is the development of the 84-acre inholding of private lands immediately upstream of the project area. There is a proposal to develop this property with residential homes (several within the riparian area of North Fork Mills River and Rocky Fork). This development has the potential to impact water quality within the North Fork Mills River watershed and therefore could impact the water quality of habitat for the aquatic MIS species.

3.7 Heritage Resources

3.7.1 Existing Condition

The project area has a high probability for heritage sites. The area has a long history of use by prehistoric and historic peoples. There many known sites along the North Fork Mills River area due to the flat terrain and proximity to water. These sites consist of eligible, not eligible, and unevaluated sites. Past management practices have not always evaluated these properties for eligibility to the National Register of Historic Places (NRHP). Historic properties that are unevaluated are managed as if eligible, and mitigations for these properties follow management prescriptions as specified in the next section. Currently, the Heritage Program management attempts to relocate sites, monitor the sites for damage and deterioration, evaluate the sites for NRHP eligibility, and preserve and protect sites.

3.7.2 Alternative A – No Action

3.7.2.1 Direct and Indirect Effects

The project would not be implemented under the No Action Alternative. There would be no direct immediate negative effects to most heritage resources in the project area. However, some heritage sites located adjacent to the project area will continue to be negatively affected, and possibly lost, by increased erosion and sedimentation over time if the No Action Alternative is selected.

3.7.2.2 Cumulative Effects

Under the No Action Alternative, historic properties within the project area would be expected to continue to experience effects from other past, present, and reasonably foreseeable future actions.

3.7.3 Alternative B & C – Proposed Actions

3.7.3.1 Direct and Indirect Effects

Under the National Historic Preservation Act (NHPA), a significant or adverse effect is one which may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or associations (36 CFR 800.9[b]). Heritage resource sites would be protected. No negative effects to heritage sites would occur if project design features are applied as specified. Protection of some of these sites will occur under these alternatives.

3.7.3.2 Cumulative Effects

If the Proposed Action is implemented, historic properties within the project area would not be negatively impacted by the planned actions. Design features of the proposed action, if followed, would insure that no negative impacts to heritage resources would occur. Some of the heritage resources that have been identified will continue to experience the normal effects from recreation and other ongoing actions while some could be protected.

CHAPTER 4 – PREPARERS AND PUBLIC INVOLVEMENT

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes, and non-Forest Service persons during the development of this environmental assessment:

4.1 ID Team Members

4.1.1 Core IDT:

Brady Dodd – Forest Hydrologist, Project Leader, NEPA Writer-Editor
Dave Danley – Zone Botanist
Dave Wright – Forest Developed Recreation Coordinator
Dennis Danner – Wildlife Biologist
Lorie Stroup – Zone Fisheries Biologist
Scott Ashcraft – Archaeologist

4.1.2 Other Forest Service Personnel Providing Input:

Gary Kauffman – Forest Botanist
Erik Crews – Forest Landscape Architect
Randy Burgess – Pisgah District Ranger
Rodney Snedecker – Forest Archaeologist

4.2 Federal, State, and Local Agencies

U.S. Fish and Wildlife Service
Army Corps of Engineers
North Carolina Wildlife Resources Commission
North Carolina Department of Water Quality

Literature Cited

N.C. Department of Environment and Natural Resources, Division of Water Quality. 2003a. Water Quality Limited 303(d) listing.

N.C. Department of Environment and Natural Resources, Division of Water Quality. 2003b. Basinwide Assessment Report for the French Broad River Basin. 55 pp.

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.

USDA Forest Service. 1994. Land and Resource Management Plan for the Nantahala and Pisgah National Forests. National Forests in North Carolina. Asheville, NC.

U.S. Fish and Wildlife Service. 2000. Federal Endangered and Threatened Species of North Carolina. Asheville, NC.

USDA Forest Service, National Forests in North Carolina. 2004. Management indicator species habitat and population trends-Nantahala and Pisgah National Forests. 829 pp.