CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4631**
WBS No.	**33805.1.1**
State Project No.	**8.2891801**
Federal Project No.	**BRZ-1347 (3)**

A. Project Description:

The purpose of this project is to replace Rutherford County Bridge No. 526 on SR 1347 (Parris Road) over West Branch Creek. The replacement structure will be a triple barrel, twelve-foot wide by nine-foot high reinforced concrete box culvert (RCBC). The culvert size is based on preliminary design information and is set by hydraulic requirements. This structure will be of sufficient length to provide two 11-foot travel lanes and 6-foot shoulders on each side, 9-foot where guardrail is present. The roadway grade of the new structure will be raised approximately 2 feet in the vicinity of the proposed reinforced concrete box culvert. A minor adjustment of the horizontal alignment is also warranted.

The approach roadway will extend approximately 600 feet from the west side of the new structure and approximately 500 feet from the east side of the new structure. The roadway will be designed as a Rural Local Route with a 60 mile per hour design speed.

Traffic will be detoured off-site during construction (See Figure 1).

B. Purpose and Need:

NCDOT Bridge Maintenance Unit records indicate Bridge No. 526 has a sufficiency rating of 55.6 out of a possible 100 for a new structure. This bridge was added to the TIP November 23, 1999 with a sufficiency rating of 40. Since that time, replacing the deck has reinforced the superstructure, which has resulted in the increased sufficiency rating. Bridge No. 526 is structurally deficient and functionally obsolete due to the deck geometry appraisal of 3 out of 9 according to Federal Highway Administration (FHWA) standards and therefore eligible for FHWA's Highway Bridge Replacement and Rehabilitation Program.

Bridge No. 526 has a thirty-five year old timber substructure with a typical life expectancy between 40 to 50 years due to the natural deterioration rate of wood. Rehabilitation of a timber structure is generally practical only when a few members are damaged or prematurely deteriorated. However, past a certain degree of deterioration, timber structures become impractical to maintain and upon eligibility are programmed for replacement. Bridge No. 526 is approaching the end of its useful life.

C. Proposed Improvements:

The following Type II improvements which apply to the project are circled:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).

   a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
   b. Widening roadway and shoulders without adding through lanes
   c. Modernizing gore treatments
   d. Constructing lane improvements (merges, auxiliary, and turn lanes)
   e. Adding shoulder drains
   f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
   g. Providing driveway pipes
   h. Performing minor bridge widening (less than one through lane)
   i. Slide Stabilization
   j. Structural BMP's for water quality improvement

2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

   a. Installing ramp metering devices
   b. Installing lights
   c. Adding or upgrading guardrail
   d. Installing safety barriers including Jersey type barriers and pier protection
   e. Installing or replacing impact attenuators
   f. Upgrading medians including adding or upgrading median barriers
   g. Improving intersections including relocation and/or realignment
   h. Making minor roadway realignment
   i. Channelizing traffic
   j. Performing clear zone safety improvements including removing hazards and flattening slopes
   k. Implementing traffic aid systems, signals, and motorist aid
   l. Installing bridge safety hardware including bridge rail retrofit

(3.) Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

   a. Rehabilitating, reconstructing, or replacing bridge approach slabs
   b. Rehabilitating or replacing bridge decks
   c. Rehabilitating bridges including painting (no red lead paint) scour repair, fender systems, and minor structural improvements
   (d.) Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.

5. Construction of new truck weigh stations or rest areas.

6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks, and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

13. Acquisition and construction of wetland, stream and endangered species mitigation sites.

14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

Estimated Costs:

Total Construction	$ 900,000
Right of Way	$ 47,000
Total	**$ 947,000**

Estimated Traffic:

Current	-	300 vpd
Year 2025	-	500 vpd
TTST	-	1%
Dual	-	2%

Accidents: Traffic Engineering has evaluated a recent three year period and found no accidents occurring in the vicinity of the project.

Design Exceptions: Design exceptions for horizontal and vertical alignments will be required.

Bridge Demolition: Bridge No. 526 is constructed entirely of timber and steel and should be possible to remove with no resulting debris based on standard demolition practices.

Alternatives Discussion:

No Build – No Build would result in eventually closing the road which is unacceptable given the volume of traffic served by SR 1347.

Rehabilitation – The bridge was constructed in 1970 and the timber materials within the bridge are reaching the end of their useful life. Rehabilitation would require replacing the timber components which would constitute effectively replacing the bridge.

Offsite Detour – Bridge No. 526 will be replaced on the existing alignment. Traffic will be detoured offsite (see Figure 1) during the construction period. NCDOT Guidelines for Evaluation of Offsite Detours for Bridge Replacement Projects considers multiple project variables beginning with the additional time traveled by the average road user resulting from the offsite detour. The offsite detour for this project would include SR 1001 (Cove Road) and SR 1331 (Piney Knob Road). The detour for the average road user would result in less than 2 minutes additional travel time (1.6 miles additional travel). Up to a seven-month duration of construction is expected on this project. Based on the guidelines, the delay is acceptable for the average road user.

In this case, maintaining traffic onsite would result in higher project costs and environmental impacts from construction of an onsite detour. Rutherford County Emergency Services has indicated that an offsite detour is acceptable and that services can be adequately re-routed during construction. The condition of all roads and bridges on the offsite detour are acceptable without improvement. Rutherford County School Transportation has indicated that rerouting buses around this project would cause minimal problems and can be accomplished safely. In view of the lower impacts to environment and property, project cost savings and no major opposition, an offsite detour is recommended. NCDOT Division 13 concurs in these recommendations.

Onsite Detour – An onsite detour was not evaluated due to the presence of an acceptable offsite detour.

Staged Construction – Staged construction was not considered because of the availability of an acceptable offsite detour.

New Alignment – There are 35 mph curves at each end of the project vicinity as well as at the bridge site. Minor improvements are included to the horizontal alignment.

Other Agency Comments:

The **N.C. Wildlife Resource Commission** and **U.S. Fish & Wildlife Service** in standardized letters provided a request that they prefer any replacement structure to be a spanning structure.

Response: At smaller stream crossing it is more economical to replace bridges with box culverts. Culverts cost less than bridges, require less maintenance throughout their service life than bridges, and last longer than bridges. Therefore, where appropriate NCDOT prefers to use box culverts to replace bridges. As there are no protected resources at this site, the proposed culvert will be designed according to current NCDOT design practices which include such measures as buried box bottoms to facilitate fish passage, dry cell(s) to allow wildlife passage, and placement to minimize channel widening and realignment.

NC Department of Cultural Resources (SHPO) – No historic architectural nor archaeological surveys required.

Public Involvement: A letter was sent by the Location & Surveys Unit to all property owners affected directly by this project. Property owners were invited to comment. No comments have been received to date.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions

ECOLOGICAL		YES	NO
(1)	Will the project have a substantial impact on any unique or important natural resource?		X
(2)	Does the project involve habitat where federally listed endangered or threatened species may occur?	X	
(3)	Will the project affect anadromous fish?		X
(4)	If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-third (1/3) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	

(5)	Will the project require the use of U. S. Forest Service lands?		X
(6)	Will the quality of adjacent water resources be adversely impacted by proposed construction activities?		X
(7)	Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?		X
(8)	Will the project require fill in waters of the United States in any of the designated mountain trout counties?	X	
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous material sites?	X	

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?		X
(11)	Does the project involve Coastal Barrier Resources Act resources?		X
(12)	Will a U. S. Coast Guard permit be required?		X
(13)	Will the project result in the modification of any existing regulatory floodway?		X
(14)	Will the project require any stream relocations or channel changes?		X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?		X
(16)	Will the project require the relocation of any family or business?		X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?		X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	

(19)	Will the project involve any changes in access control?		X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?		X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?		X
(22)	Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	
(23)	Is the project anticipated to cause an increase in traffic volumes?		X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	
(26)	Is there substantial controversy on social, economic, or environmental grounds concerning the project?		X
(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?		X
(29)	Will the project affect any archaeological remains, which are important to history or pre-history?		X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?		X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation		

	Act of 1965, as amended?	☐	X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the Natural System of Wild and Scenic Rivers?	☐	X

F. **Additional Documentation Required for Unfavorable Responses in Part E**
(Discussion regarding all unfavorable responses in Part E should be provided below. Additional supporting documentation may be attached, as necessary.)

Item (2) Threatened and Endangered Species Habitat
The project study area does contain potential suitable habitat for dwarf-flowered heartleaf and small whorled pogonia. The project will have no effect on populations of dwarf-flowered heartleaf due to the absence of any species of Hexastylis within the project study area. A survey was conducted on May 11, 2005 for the small whorled pogonia and a biological conclusion of no effect was rendered due to the absence of any species within the project study area.

Item (8) Mountain Trout County
Rutherford County is listed as a mountain trout county. West Branch Creek does not have a water resource classification involving trout and the NC Wildlife Resources Commission states this stream is not designated as trout water.

Item (9) GeoEnvironmental Concerns
Two known aboveground storage tanks (AST) sites were identified within the proposed project corridor. These appear to be farm tanks used to mix herbicides and/or pesticides to spray on the adjacent fields. Monetary and scheduling impacts resulting from these sites are anticipated to be low to moderate. The GeoEnvironmental Section will provide soil and groundwater assessments on each of the above properties before right of way acquisition.

G. CE Approval

TIP Project No.	**B-4631**
WBS No.	**33805.1.1**
State Project No.	**8.2891801**
Federal Project No.	**BRZ-1347 (3)**

Project Description:

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The approach roadway will extend approximately 600 feet from the west side of the new structure and approximately 500 feet from the east side of the new structure. The roadway will be designed as a Rural Local Route with a 60 mile per hour design speed.

Traffic will be detoured off-site during construction (See Figure 1).

Categorical Exclusion Action Classification:

____ TYPE II(A)
_X_ TYPE II(B)

Approved:

1-5-06 — Date
William T. Goodwin, Jr.
Bridge Project Development Unit Head
Project Development & Environmental Analysis Branch

1-05-06 — Date
Bridge Project Development Group Leader
Project Development & Environmental Analysis Branch

1-5-06 — Date
Mary Scott
Bridge Project Development Engineer
Project Development & Environmental Analysis Branch

For Type II(B) projects only:

1-5-2006 — Date
for John F. Sullivan, III, Division Administrator
Federal Highway Administration

PROJECT COMMITMENTS

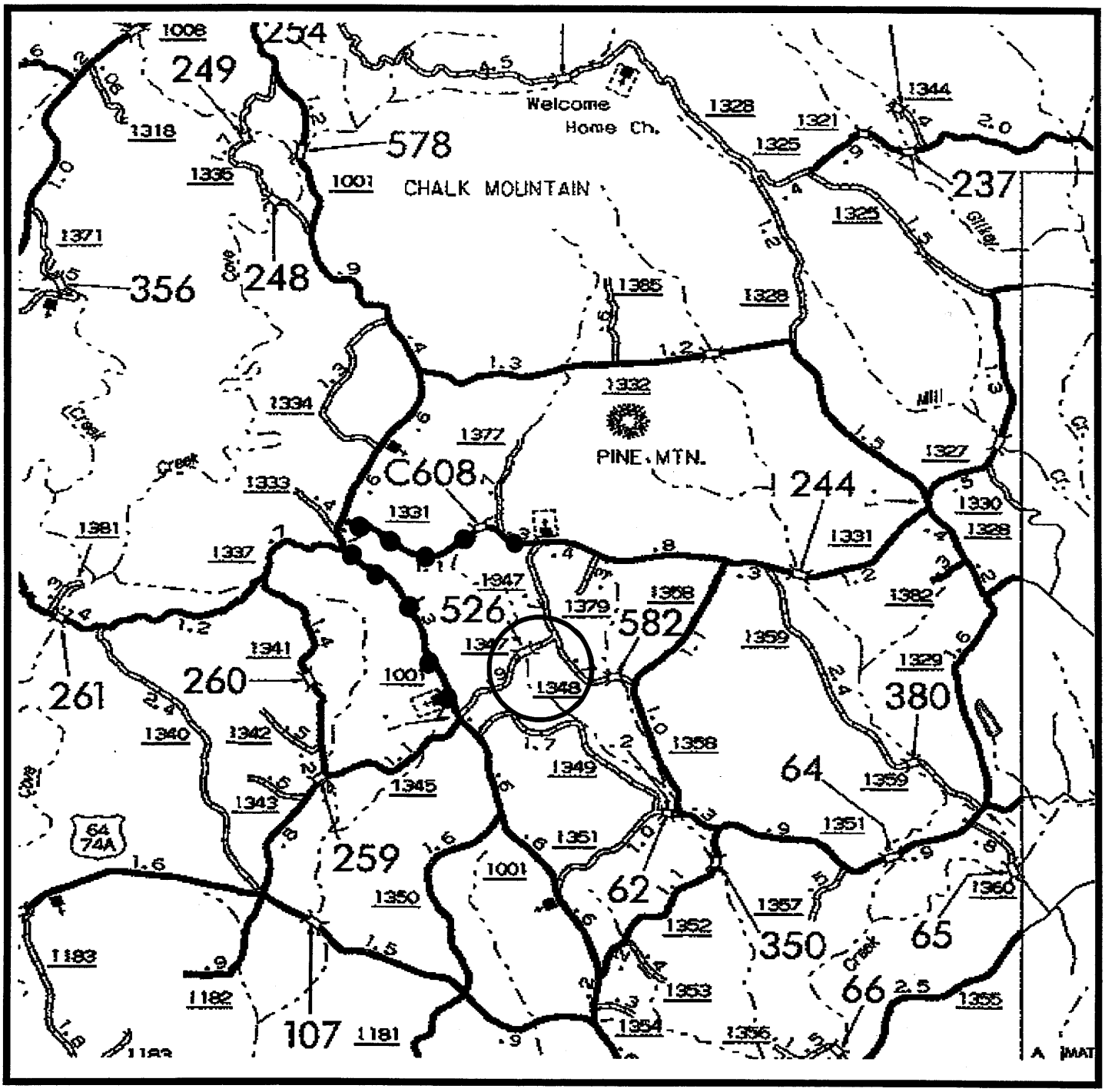
Rutherford County
Bridge No. 526 on SR 1347
Over West Branch Creek
Federal Project BRZ-1347 (3)
WBS 33805.1.1
State Project 8.2891801
TIP No. B-4631

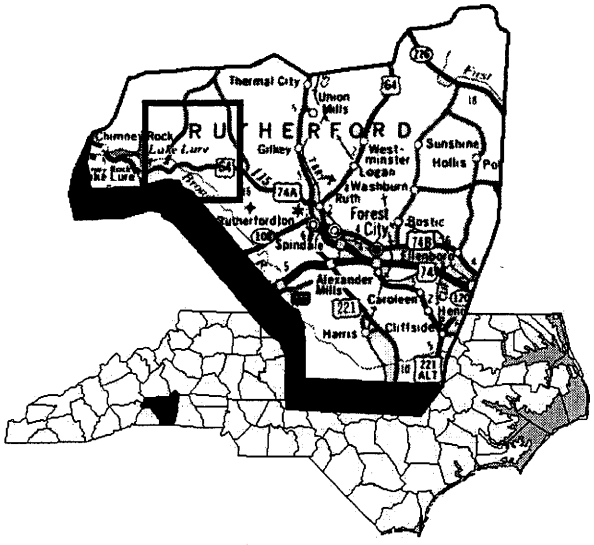
Geotechnical Unit / GeoEnvironmental Section

Two known aboveground storage tanks (AST) sites were identified within the proposed project corridor. These appear to be farm tanks used to mix herbicides and/or pesticides to spray on the adjacent fields. The GeoEnvironmental Section will provide soil and groundwater assessments on each of the above properties before right of way acquisition.

Natural Environment Unit – Bridge Demolition

The entire bridge is constructed of timber and steel. Therefore, it is unlikely that there will be any temporary fill resulting from bridge demolition.



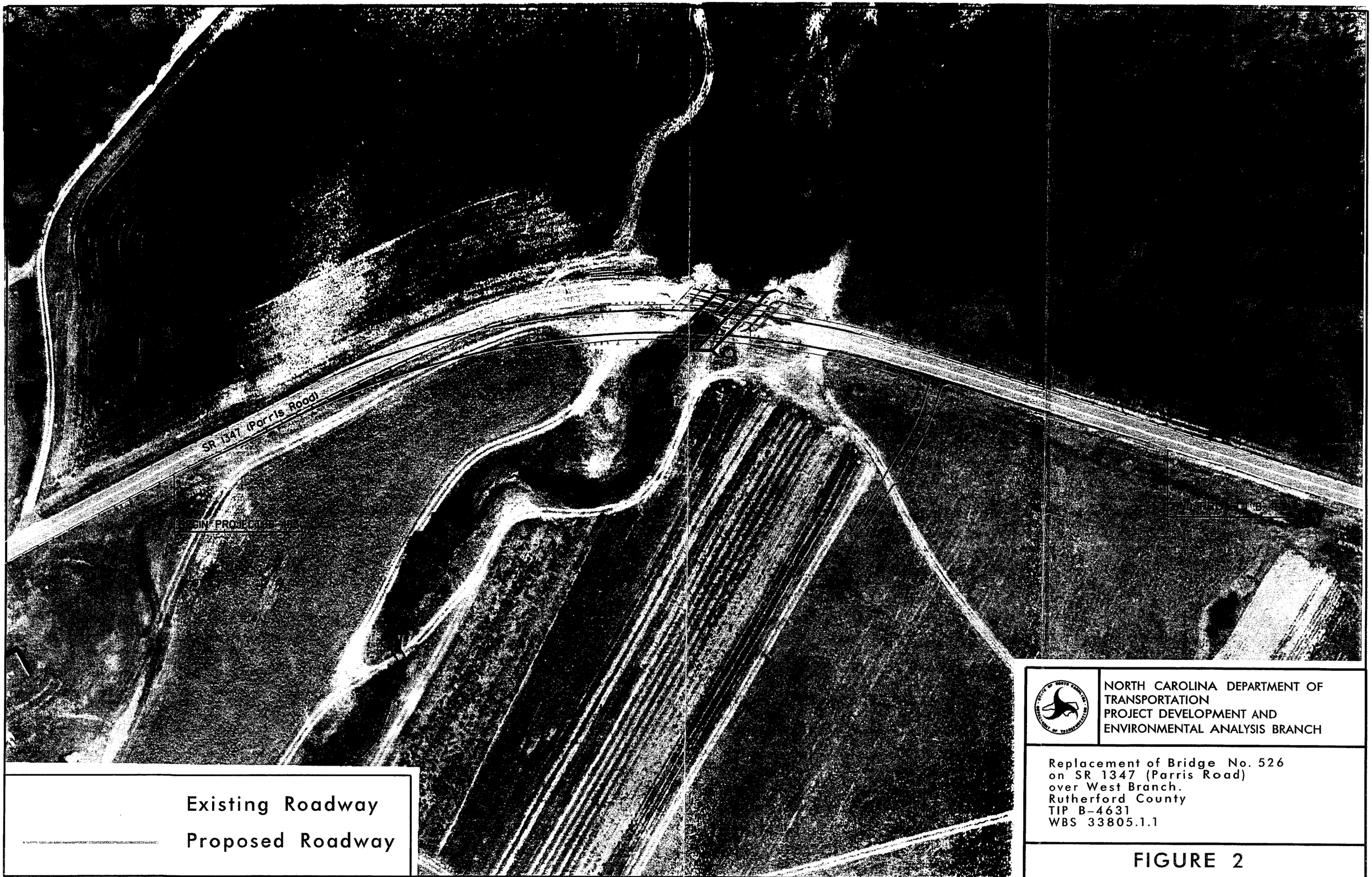


STUDIED DETOUR ROUTE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

RUTHERFORD COUNTY
REPLACE BRIDGE NO. 526 ON SR 1347
OVER A CREEK
B-4631

Figure 1



Existing Roadway

Proposed Roadway

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

Replacement of Bridge No. 526
on SR 1347 (Parris Road)
over West Branch.
Rutherford County
TIP B-4631
WBS 33805.1.1

FIGURE 2

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RECEIVED
AUG 19 2004
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

August 12, 2004

MEMORANDUM

TO: Gregory Thorpe, Ph.D., Director
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: Peter B. Sandbeck PBS for Peter Sandbeck

SUBJECT: 2004 Bridge Projects, including B-3492, B-4408, B-4409, B-4410, B-4446, B-4466, B4469, B-4518, B-4545, B-4573, B-4631, B-4423, B-4424, B-4454, B-4520, B-4538, B-4540, B-4548, B-4549, B-4567, B-4578, B-4648, B-4664, B-4665, B-4504, B-4560, B-4587, B-4618, B-4644, B-4649, B-4651, B-4658, B-4671, B-3624, B-3819, B-3911, B-4404, B-4552, B-4613, B-4646, B-4675 B-3169, B-3606, B-3802, B-3803, B-3804, B-4523, B-4524, B-4525, B-4526, Multi-county, ER 04-1280-ER 04-1330

On July 28, 2004, Sarah McBride, our preservation specialist for transportation projects, met with the North Carolina Department of Transportation (NCDOT) staff for a meeting of the minds concerning the above projects. We reported on our available information on historic architectural and archaeological surveys and resources along with our recommendations. NCDOT provided project descriptions, area photographs, and aerial photographs at the meeting.

Based on our review of the photographs and the information discussed at the meeting, we have included our comments for each bridge project on a spreadsheet attached to this letter. These comments are provided for each project as proposed.

If an archaeological survey is requested on the spreadsheet, a separate memorandum from the Office of State Archaeology, explaining whether a general survey is required or if the survey is predicated upon an off-site detour or new location, is attached.

Having provided this information, we look forward to receipt of either a Categorical Exclusion or Environmental Assessment which indicates how NCDOT addressed our comments.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and considerations. If you have any questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

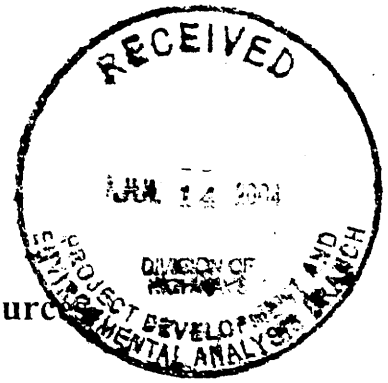
PBS:w

Attachments
1 Spreadsheet
16 Memos

cc: Matt Wilkerson, NCDOT
Mary Pope Furr

	TIP	BRIDGE	COUNTY	DIVISION	BUILT	PDE	Architecture	Archaeology
ER04 1314	B-3492	580056	McDOWELL	13	1962	Hancock	Yes	No
ER04 1285	B-4408	030265	ANSON	10	1961	Hancock	No	No
ER04 1286	B-4409	030308	ANSON	10	1922	Hancock	No	No
ER04 1287	B-4410	030307	ANSON	10	1931	Hancock	Yes	No
ER04 1301	B-4446	100227	BUNCOMBE	13	1956	Hancock	No	No
ER04 1290	B-4466	210004	CLAY	14	1952	Hancock	No	No
ER04 1291	B-4469	220219	CLEVELAND	12	1952	Hancock	No	No
ER04 1288	B-4518	350110	GASTON	12	1962	Hancock	No	No
ER04 1307	B-4545	440072	HENDERSON	14	1963	Hancock	No	No
ER04 1300	B-4573	540183	LINCOLN	12	1965	Hancock	No	No
ER04 1306	B-4631	800526	RUTHERFORD	13	1970	Hancock	No	No
ER04 1329	B-4423	060067	BEAUFORT	2	1965	Capps	No	No
ER04 1330	B-4424	060068	BEAUFORT	2	1966	Capps	No	No
ER04 1302	B-4454	150043	CARTERET	2	1963	Capps	No	No
ER04 1292	B-4520	360032	GATES	1	1952	Capps	Yes	No
ER04 1280	B-4538	410025	HALIFAX	4	1965	Capps	No	No
ER04 1281	B-4540	410142	HALIFAX	4	1962	Capps	Yes	Yes
ER04 1303	B-4548	450002	HERTFORD	1	1960	Capps	No	Yes
ER04 1309	B-4549	450042	HERTFORD	1	1960	Capps	Yes	Yes
ER04 1299	B-4567	530069	LENOIR	2	1971	Capps	Yes	Yes
ER04 1298	B-4578	570008	MARTIN	1	1974	Capps	No	No
ER04 1325	B-4648	880017	TYRRELL	1	1977	Capps	No	No
ER04 1317	B-4664	920025	WARREN	5	1957	Capps	Yes	Yes
ER04 1318	B-4665	920036	WARREN	5	1955	Capps	No	Yes
ER04 1305	B-4504	320052	EDGECOMBE	4	1964	Johnson	No	Yes
ER04 1312	B-4560	500102	JOHNSTON	4	1956	Johnson	Yes	Yes
ER04 1297	B-4587	630082	NASH	4	1961	Johnson	No	Yes
ER04 1326	B-4618	770445	ROBESON	6	1955	Johnson	Yes	No
ER04 1284	B-4644	830057	STANLY	10	1961	Johnson	No	No
ER04 1324	B-4649	890377	UNION	10	1962	Johnson	No	No
ER04 1323	B-4651	890251	UNION	10	1957	Johnson	No	No
ER04 1315	B-4658	910345	WAKE	5	1960	Johnson	No	No
ER04 1313	B-4671	950035	WAYNE	4	1961	Johnson	No	Yes
ER04 1327	B-3624	130190	CALDWELL	11	1981	Pipkin	No	No
ER04 1328	B-3819	130184	CALDWELL	11	1962	Pipkin	No	No
ER04 1320	B-3911	850038	SURRY	11	1923	Pipkin	Yes	No
ER04 1286	B-4404	000102	ALAMANCE	7	1968	Pipkin	Yes	No
ER04 1310	B-4552	480100	IREDELL	12	1963	Pipkin	Yes	No
ER04 1295	B-4613	750415	RANDOLPH	8	1959	Pipkin	No	Yes
ER04 1294	B-4646	850132	SURRY	11	1962	Pipkin	Yes	No
ER04 1311	B-4675	960034	WILKES	11	1960	Pipkin	No	No
ER04 1293	B-3169	310158	DURHAM	5	1960	Williams	Yes	No
ER04 1303	B-3606	040070	ASHE	11	1963	Williams	Yes	No
ER04 1282	B-3802	040229	ASHE	11	1960	Williams	No	No
ER04 1304	B-3803	040334	ASHE	11	1966	Williams	Yes	No
ER04 1283	B-3804	040296	ASHE	11	1964	Williams	Yes	No
ER04 1319	B-4523	380164	GRANVILLE	5	1955	Williams	No	Yes
ER04 1320	B-4524	380193	GRANVILLE	5	1956	Williams	No	Yes
ER04 1321	B-4525	380133	GRANVILLE	5	1960	Williams	No	Yes
ER04 1322	B-4526	380200	GRANVILLE	5	1957	Williams	No	Yes

(Goodwin)
By E



North Carolina Department of Cultural Resources

State Historic Preservation Office

David L.S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources

July 8, 2004

MEMORANDUM

TO: Greg Thorpe, Ph.D
Project Development and Environmental Analysis Branch
Division of Highways
Department of Transportation

FROM: David Brook RSE for David Brook

SUBJECT: Replace Bridge No. 56 on SR 1006 over N. Branch Hungry Creek, B-4145, Henderson County, ER03-0941

On March 3, 2004, Sarah McBride of our staff met with North Carolina Department of Transportation (NCDOT) staff concerning the above project.

Staff discussed the project and reviewed photographs and an aerial photograph. Based upon this review we are aware of no historic structures that would be affected by this project.

There are no recorded archaeological sites within the proposed project area. If the replacement is to be located along the existing alignment with traffic detoured off-site, no archaeological survey is recommended. If the project requires an on-site detour or realignment, an archeological survey is recommended.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Mary Pope Furr
Matt Wilkerson
Robin Hancock, PDEA

NATURAL RESOURCES TECHNICAL REPORT

REPLACEMENT OF BRIDGE NO. 526 ON SR 1347 OVER WEST BRANCH MOUNTAIN CREEK RUTHERFORD COUNTY, NORTH CAROLINA

T.I.P. No B-4631
State Project No. 8.2891801
Federal Aid Project No. BRZ-1347(3)

NCDOT Consulting Project No. 02-ES-03

Prepared for:

The North Carolina Department of Transportation
Raleigh, North Carolina

August 2004

NATURAL RESOURCES TECHNICAL REPORT

Replacement of Bridge No. 526
on SR 1347 over West Branch Mountain Creek

Rutherford County, North Carolina
(T.I.P. No. B-4631)
State Project No.: 8.2891801
Federal Aid Project No.: BRZ-1347(3)
WS Element: 33805.1.1

ESI Project ER02-026.03
Task 33

Prepared for:

The North Carolina Department of Transportation
Raleigh, North Carolina

Prepared by:

ENVIRONMENTAL SERVICES, INC.
524 South New Hope Road
Raleigh, NC 27610
Tel (919) 212-1760 Fax (919) 212-1707

August 2004

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1.0 INTRODUCTION

1.1 Project Description

The North Carolina Department of Transportation (NCDOT) is evaluating the replacement of Bridge No. 526 on SR 1347 over West Branch Mountain Creek in Rutherford County, North Carolina (TIP B-4631). Environmental Services, Inc., (ESI) was tasked with completing an assessment of the existing environmental conditions within the detailed project study area. At the time of this report, specific alternatives have not been developed for this project.

1.2 Definitions

The project study area consists of a bubble that extends approximately 0.5 mile along SR 1347 centered on the existing bridge in Rutherford County (Figure 1). For the purposes of this study, the project study area width is approximately 700 feet (ft). The project vicinity describes an area extending 0.5 mile on all sides of the project study area. Project region describes the area represented by a 7.5 minute USGS quadrangle map with the project study area occupying the central position, approximately 60 square miles.

1.3 Purpose

This Natural Resources Technical Report (NRTR) is intended to document existing natural resources in the project study area in order to assist in the preparation of an Environmental Assessment (EA) and to aid in the design of alternatives. Specifically, the tasks performed for this study include: 1) an assessment of biological features within the project study area including descriptions of vegetation, wildlife, protected species, jurisdictional surface waters and wetlands, and water quality issues; 2) mapping of specific resources including plant community distribution, jurisdictional surface waters and wetlands, and potential habitat for endangered species; 3) an evaluation of potential impacts resulting from construction; and 4) a preliminary determination of permit needs. The environmental impact analysis is based on the mapped project study area and does not take into account final design or limits of construction.

1.4 Methodology

Materials and research data in support of this investigation have been derived from a number of sources. The U.S. Geologic Survey (USGS) 7.5-minute [Shingle Hollow, NC] topographic quadrangle map was consulted to determine physiographic relief and to assess landscape characteristics (USGS 1982). The National Wetland Inventory (NWI) map of this same quadrangle was reviewed prior to the initiation of field studies (USFWS 1994). Additional information on soils, topography, and physiography was obtained from the county soil survey available through the Natural Resource Conservation Service (NRCS) (formerly Soil Conservation Service) for Rutherford County (maps unpublished) (USDA 2000). Field investigations were conducted in March 2004.

The USGS 1998 Digital Orthophotos (1:4800) provided an overview of baseline features in the project study area (USGS 1998). These photographs served as the basis for mapping plant community distributions. Plant community distributions were delineated from available mapping sources and verified in the field. Dominant components of these communities were examined and the species composition of each was recorded. Plant community descriptions are based on the classification system developed by the N.C. Natural Heritage Program (NCNHP) (Schafale and Weakley 1990). When appropriate, community descriptions have been modified to better reflect field observations. Vascular plant names generally follow Radford *et al.* (1968).

Surface waters within the project study area were visited and evaluated to ascertain physical characteristics. All stream channel segments with the project study area were classified using the Natural Stream Channel Classification System (Rosgen 1996) and Cowardin Classification (Cowardin *et al.* 1979). Water quality information for streams and tributaries within the project study area were derived from available sources provided through the N.C. Department of Environment and Natural Resources (DENR), formerly the N.C. Department of Environment, Health and Natural Resources (DEHNR) (DWQ 1997, DWQ 1998, DWQ internet updates March 2004). Quantitative sampling was not undertaken to evaluate the DENR data.

Jurisdictional wetlands were identified using the three-parameter approach (hydrophytic vegetation, hydric soils, and evidence of hydrology) outlined in the *Corps of Engineers Wetlands Delineation Manual* (DOA 1987). Jurisdictional wetlands and surface waters within the project study area were field-delineated and mapped using Global Positioning System (GPS) on 24 March 2004. The jurisdictional delineation information has been submitted to the U.S. Army Corps of Engineers (USACE). However, at the time of this report the jurisdictional determination has not been received.

Wildlife distribution and habitat use were determined through field observation, evaluation of habitat type distributions, and a review of supporting literature (Martof *et al.* 1980, Potter *et al.* 1980, Lee *et al.* 1980, Webster *et al.* 1985, Menhinick 1991, Hamel 1992, Rohde *et al.* 1994, Palmer and Braswell 1995). Techniques used to document terrestrial fauna included visual observation, identification of bird calls and songs, and identification of tracks.

The current list (29 January 2003) provided by the U.S. Fish and Wildlife Service (USFWS) of federally protected species with ranges extending into Rutherford County was reviewed prior to initiation of field studies (USFWS 2003). Records maintained by the NCNHP were consulted on 22 March 2004 for documented occurrences of federal-listed and state-listed species before commencing the field effort (NCNHP 2004a). A general literature review provided information on the distribution and ecological requirements of various taxa.

1.5 Qualifications

ESI Personnel

Investigator:	Gail Tyner
Education:	B.S. Wildlife and Fisheries Science, North Carolina State University
Experience:	Senior Scientist, 6 years
Expertise:	Natural resource investigations, wetland delineation
Investigator:	Stuart Bryan
Education:	B.S. Natural Resources, North Carolina State University
Experience:	Senior Scientist, 6 years
Expertise:	Natural resource investigations, wetland delineation
Investigator:	Tyler McEwen
Education:	B.S. Environmental Science (Watershed Hydrology), North Carolina State University
Experience:	Project Scientist, 2 years
Expertise:	Natural resource investigations, wetland delineation

2.0 PHYSICAL RESOURCES

The project study area is located in the Mountain physiographic province near the Piedmont boundary of North Carolina. Topography in the project study area is generally characterized as gently sloping to moderately steep. Elevations within the project study area range from 960 ft above mean sea level along the West Branch of Mountain Creek to 1,000 ft above mean sea level (USGS 1982).

The project study area is dominated by residential and agricultural land uses. The majority of the project vicinity and project region are rural in nature.

2.1 Soils

Soil development is dependent upon biotic and abiotic factors which include past geologic activities, nature of parent material, environmental and human influences, plant and animal activity, age of sediments, climate, and topographic position. Mapping units are named for the major soil or soils within the unit, but may contain minor inclusions of other soils (USDA 2000). There are no hydric soil mapping units within the project study area (USDA 1993). The project study area contains two non-hydric soil mapping units that may contain hydric inclusions, Chewacla loam 0 to 2 percent slopes and Dogue loam 1 to 6 percent slopes, and three other non-hydric soil mapping units, Pacolet sandy clay loam 8 to 15 percent slopes eroded, Pacolet sandy clay loam 15 to 25 percent slopes eroded, and Skyuka loam 2 to 8 percent slopes (USDA 2002). Soil mapping can be found in Figure 2 in Appendix A. There is no published soil survey available for Rutherford County.

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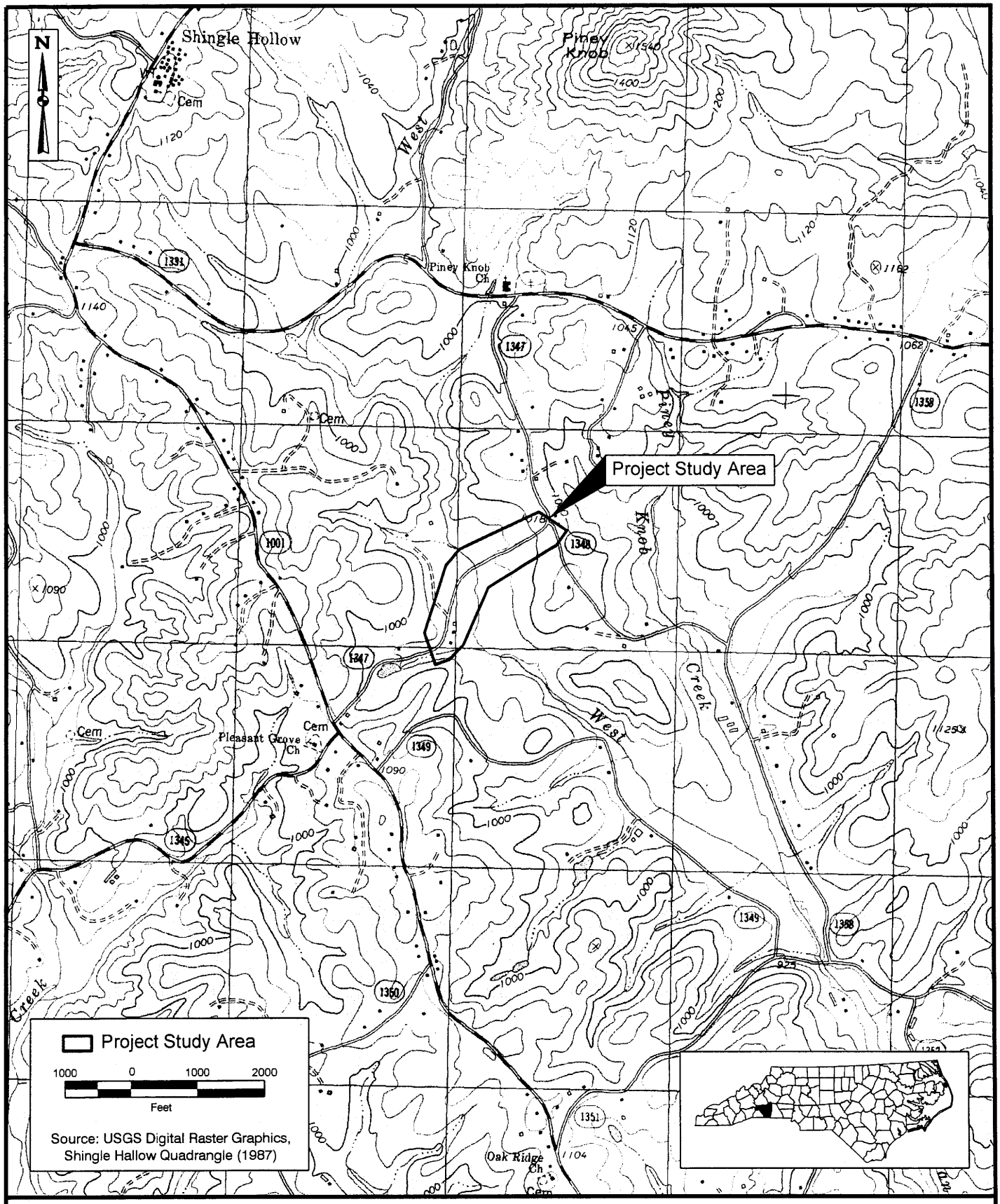

Environmental Services, Inc.

Project Location
Bridge No. 526 on SR 1347
over West Branch Mountain Creek
Rutherford County, North Carolina
T.I.P. B-4631

Figure:	1
Project:	ER02026.03
Date:	August 2004

- **Chewacla loam (*Fluvaquentic Dystrochrepts*), somewhat poorly drained (ChA)** is mapped in the center and southwest corner of the project study area along West Branch Mountain Creek and the unnamed tributary to West Branch Mountain Creek (UTWBMC). The majority of the soil mapping unit is under agricultural land use. There are no wetland areas associated with this soil mapping unit. This soil is occasionally flooded under undisturbed conditions and gently sloping. Slopes are 0 to 2 percent. This soil mapping unit is non-hydric with hydric inclusions of Wehadkee silt loam and tends to average a depth to high water table between 0.5 and 1.5 ft (USDA 1993, USDA 2002).

- **Dogue loam (*Aquic Hapludults*), moderately well drained (DoB)** is located in the central portion of the project study area and is under agricultural land use. This soil is found on stream terraces and is rarely flooded. Slopes are 1 to 6 percent. This soil mapping unit is non-hydric with hydric inclusions of poorly drained soils and tends to average a depth to high water table between 1.5 and 3.0 ft (USDA 1993, USDA 2002).

- **Pacolet sandy loam (8 to 15 percent slopes) (*Typic Kanhapludults*), well drained (PaC2)** is mapped in the northeastern corner of the project study area. This soil is well drained and moderately steep with 8 to 15 percent slopes. This soil mapping unit is non-hydric and tends to average a depth to high water table of over 6.0 ft (USDA 1993, USDA 2002).

- **Pacolet sandy loam (15 to 25 percent slopes) (*Typic Kanhapludults*), well drained (PaD2)** is mapped throughout the project study area. This soil is well drained and moderately steep with 15 to 25 percent slopes. This soil mapping unit is non-hydric and tends to average a depth to high water table of over 6.0 ft (USDA 1993, USDA 2002).

- **Skyuka loam (2 to 8 percent slopes) (*Ultic Hapludalfs*), well drained (SkB)** is mapped in the southwest corner of the project study area. This soil is well drained with gentle slopes of 2 to 8 percent. This soil mapping unit is non-hydric and tends to average a depth to high water table of over 6.0 ft (USDA 1993, USDA 2002).

2.2 Water Resources

Brief descriptions of water resource characteristics are provided for the principle streams within the project study area. Principle streams are defined here as named rivers and creeks depicted on USGS 7.5-minute (1:24000 scale) topographic quadrangles. All streams were delineated in the field and mapped using GPS. Physical characteristics of stream channels are described in Section 2.2.2 and mapping depicting stream locations is presented in Figure 3 in Appendix A.

2.2.1 Water Quality Classification

The project study area is located within sub-basin 030802 of the Broad River Basin (DWQ 1997, DWQ 2001) and is part of the USGS hydrologic unit 03050105 (USGS 1974). Drainages within the project study area are all part of the Mountain Creek watershed.

Best Usage Classifications (BUC) and Stream Index Numbers (SIN) follow *Classifications and Water Quality Standards* published for each river basin (DEM 1993), as updated through 25

March 2004. There are two streams within the project study area; West Branch Mountain Creek and UTWBMC (Figure 3 in Appendix A). West Branch Mountain Creek has been assigned SIN 9-25-3 and a BUC of **C** from its source to Mountain Creek (DWQ 2004a). West Branch of Mountain Creek originates approximately 3.5 miles north of the project study area and flows in a southerly direction to its confluence with Mountain Creek approximately 3.5 downstream of the project study area. UTWBMC originates west of the project study area and flows in a east direction through the project study area to its confluence with West Branch Mountain Creek. The UTWBMC within the project study area has not been assigned a SIN, but carries the same BUC as West Branch Mountain Creek. Physical descriptions of these streams can be found in section 2.2.2.

Class **C** waters are freshwaters protected for secondary recreation, fishing, aquatic life (including propagation and survival), and wildlife. Secondary recreation is any activity involving human body contact with water on an infrequent or incidental basis (DEM 1993).

There are no Outstanding Resource Waters (**ORW**), High Quality Waters (**HQW**), Water Supplies in natural and undeveloped watersheds (**WS-I**), or Water Supplies in predominantly undeveloped watersheds (**WS-II**) within 3.0 miles upstream or downstream of the project study area (DEM 1993, DWQ 2004a). No stream that flows through the project study area is designated as a National Wild and Scenic River or a state Natural and Scenic River (DEM 1993, DWQ 2004a).

DWQ has compiled a comprehensive list of impaired waterbodies according to the Clean Water Act Section 303(d) and 40 CFR 130.7 [Section 303(d) list]. A waterbody that does not meet its water quality standards for its designated uses is considered to be impaired. No streams in the project study area or within 3.0 miles of the project study area have been listed as impaired waters according to the 303(d) list (DWQ 2004b).

Rutherford County is a county in which Mountain Trout Waters have been designated. The stream reaches in the project study area have not been designated as Mountain Trout Waters (Tr) (DEM 1993, DWQ 2004a).

Water Quality Information

One method used by DWQ to monitor water quality is through long-term monitoring of macroinvertebrates (DEM 1989). Bioclassification of benthic macroinvertebrate assemblages is based on monitoring at long-term monitoring stations (formerly part of the Benthic Macroinvertebrate Ambient Network [BMAN]). There are no benthic macroinvertebrate monitoring stations within the project study area (DWQ 2001). The closest benthic macroinvertebrate monitoring station is located approximately 10.0 miles downstream from the project study area in Mountain Creek at SR 1149 near Union, NC. This station was monitored in 1995 and 2000. This site was rated Good in 1995, and declined to Good/Fair rating in 2000 (DWQ 2001). It is unknown whether the decline in the bioclassification rating is due to a

decrease in water quality or to the heavy rains prior to sampling which increased sedimentation and scour (DWQ 2001).

Another measure of water quality used by the DWQ is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish communities. There are no fish sampling stations within the project study area or within any of the project study area streams as part of the DWQ Basinwide Fish Community Assessment (DWQ 2001, DWQ 2004c).

Permitted Discharges

Discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge are broadly referred to as "point sources." Wastewater point source discharges include municipal (city and county), industrial wastewater treatment plants, and small domestic wastewater treatment systems serving schools, commercial offices, residential subdivisions, and individual homes (DWQ 2004d). Stormwater point source discharges include stormwater collection systems for municipalities and stormwater discharges associated with certain industrial activities. Certain dischargers in North Carolina must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit. According to 40 CFR Section 122.3, certain discharges are exempt from NPDES permits. Point source discharges are regulated through the NPDES program. Permitted discharges not subject to NPDES permits are provided in NCAC T15A2H.0106 (f).

Seventeen permitted discharges are located within the 030802 sub-basin. However, there are no permitted discharges located within the project study area or on any of the project study area streams (DWQ 2004d). The nearest permitted discharge is located on the Broad River more than 15.0 miles downstream of the project study area.

Nonpoint Source Discharges

Nonpoint source (NPS) pollution is described as pollution contained in stormwater and snowmelt runoff from agricultural, urban, mined, and other lands (DWQ 1996). NPS pollution comes from diffuse sources in contrast to "point" source pollution, which is discharged through a pipe or outlet. Surface water as well as leachate to groundwater can be impacted by NPS pollution (DWQ 1996). Evidence of NPS discharges observed within the project study area includes stormwater runoff and sedimentation from agricultural areas.

2.2.2 Surface Water Characteristics

There are two streams, West Branch Mountain Creek and UTWBMC, located within the project study area (Figure 3 in Appendix A).

In the western portion of the project study area UTWBMC has a substrate consisting of sand and gravel. At the time of the field visit, the water was approximately 2 to 4 inches deep and 1.5 ft across with little flow and little to no turbidity. In the central portion of the project study area

West Branch Mountain Creek has a substrate of sand, gravel, and rock. This stream was approximately 4 to 8 inches deep and 10 to 17 ft wide with little to no turbidity.

As part of the NRTR, all surface waters were classified using the Natural Stream Channel Classification System (Rosgen 1996) and Cowardin Classification (Cowardin *et al.* 1979). The Natural Stream Channel Classification effort was a Level 1 classification, and consisted of a general description of channel type without detailed measurements.

Natural Stream Channel Classification

The Natural Stream Channel Classification System uses several definitive criteria for classification: 1) number of channels associated with a stream; 2) slope; 3) width-to-depth ratio; 4) entrenchment ratio; 5) sinuosity; and 6) bed material. This classification system uses the first five criteria to assign one of eight channel types to a reach of a stream. The eight types are designated A, B, C, D, DA, E, F, and G. Use of the Natural Stream Channel Classification System for a Level 1 classification requires the identification of several features in the field including bankfull width and depth (the stage at which the controlling channel forming flow occurs), slope, sinuosity, and valley morphology.

Prior to initiation of field efforts, available mapping of stream channel segments within the project study area was reviewed to estimate sinuosity. In the field, all stream channels were traversed to identify any significant changes in channel type. Estimations of channel width, bankfull depth, and flood-prone width were made at selected locations to verify channel type. These locations were selected because they were either representative of the stream as a whole or of a specific reach. Sinuosity was estimated in the field and compared to estimated sinuosity from the available mapping. Slope was also estimated in the field. Three channel types were identified within the project study area: B, C, and F. A brief description of each channel type found in the project study area follows.

- West Branch Mountain Creek is characterized as a "F" type stream upstream of Bridge No. 526 and a "C" type stream downstream of Bridge No. 526. "F" type streams typically have a low gradient channel entrenched in highly weathered material with moderate sinuosity. "F" type channels are characterized by meandering, laterally unstable channel with high bank erosion rates. "C" type streams typically have a gently sloped, relatively wide and shallow, slightly entrenched channel with moderate to high sinuosity. "C" type channels are characterized by riffle-pool sequences, well-defined meanders, and a well-developed floodplain.
- The UTWBMC is characterized as a "B" type stream. "B" type streams have a moderately sloped, relatively wide and shallow, somewhat entrenched channel with moderate sinuosity. "B" type channels are characterized by step-pool sequences, somewhat well defined meanders, and lack a well-developed floodplain.

Cowardin Classification

All streams within the project study area are considered to be riverine systems (Cowardin *et al.* 1979). Riverine systems may be perennial or intermittent and are identified as those areas contained within a channel that are not dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and contain less than 0.5 parts per thousand ocean-derived salts (Cowardin *et al.* 1979).

The streams have been classified as upper perennial riverine systems (R3). R3 systems have no tidal influence, and generally have fast flowing water all year, usually with very little floodplain development (Cowardin *et al.* 1979). Stream lengths and flow characteristics (perennial or intermittent) are provided in Table 2. Mapping of stream features is provided in Figure 3 in Appendix A.

Stream Importance

To aid in alternative analyses and to help determine stream mitigation requirements, the USACE designates streams as either important or unimportant. Streams that have perennial flow, associated wetlands, significant aquatic fauna, or associated Threatened and Endangered Species are generally considered to be important, and impacts to these streams would require mitigation. Intermittent streams may be considered important if the associated wetlands, significant aquatic fauna, or Threatened and Endangered Species criteria are met. Streams designated as unimportant do not typically require mitigation. Unimportant streams tend to be very small intermittent channels with undefined bed and bank or excavated ditches that have captured groundwater flow. USACE Stream Quality Assessment Worksheets were completed for all project study area streams. Each stream is numerically rated using these worksheets and are intended to be used as a guide to environmental professionals in gathering data required by the USACE to make a preliminary assessment of stream quality (Important vs. Unimportant). The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement (USACE 2003). At the time of this report a USACE field review has not been held. ESI has included recommendations as to the important or unimportant stream designation based on the field investigation; however the final decision lies with the USACE. Both of the project study area streams have been designated as important and mitigation would be required for impacts.

2.2.3 Water Resource Impacts

There are approximately 1,565 linear ft of perennial stream channel within the project study area. Section 402-2 of NCDOT's *Standard Specifications for Roads and Structures* is labeled **Removal of Existing Structure**. This section outlines restrictions and Best Management Practices for Bridge Demolition and Removal (BMP-BDRs), as well as guidelines for calculating maximum potential fill in the creek resulting from demolition. Bridge No. 526 is approximately 60 ft in length and 18 ft in width. The superstructure consists of a timber floor on I-beams. The

substructure is composed of end bents, interior end bents with timber caps on timber piles on 7-foot centers. No fill is anticipated by removing the deck and timber piles.

This project can be classified as a Case 3 by the BMPs for Bridge Demolition and Removal (NCDOT 1999). Case 3 places no special restrictions beyond those outlined in BMPs for Protection of Surface Waters. However, in stream work should be coordinated with the North Carolina Wildlife Resource Commission (NCWRC).

Construction of the proposed project may impact water resources by one or more of the following processes: bridge and causeway widening, box culvert and/or pipe construction, and box culvert and pipe extension. Construction activities could alter and/or interrupt stream flows and water levels at each stream crossing. This type of disruption to a stream reduces stream flow downstream of the project. Temporary diversions of water flow tend to raise the water level upstream of the project and lower the water level downstream of the project. Stream crossing location/extent can not be determined until a final design project is completed. A discussion of physical impacts to jurisdictional streams and wetlands can be found in Section 4.3.

Project construction may result in the following impacts to surface waters:

- Increased sedimentation and siltation from construction and/or erosion.
- Alteration of water levels and flows due to interruptions and additions to surface and ground water flow from construction.
- Changes in light incidence and water clarity due to increased sedimentation and vegetation removal.
- Changes in water temperature due to vegetation removal.
- Increased nutrient loading during construction via runoff from exposed areas.
- Increased concentration of toxic compounds from highway runoff, construction, toxic spills, and increased vehicular use.

Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and use of best management practices. The contractor will be required to follow contract specifications pertaining to erosion control measures (as outlined in 23 CFR 650, Subpart B and Article 107-13) entitled *Control of Erosion, Siltation, and Pollution* (NCDOT, Specifications for Roads and Structures). These measures include:

- Use of dikes, berms, silt basins, and other containment measures to control runoff during construction. Regular maintenance and inspection of these structures to insure effectiveness.
- Elimination of construction staging areas in floodplains or adjacent to streams and tributaries will help reduce the potential for petroleum contamination or discharges of other hazardous materials into receiving waters.

- Rapid re-seeding of disturbed sites to help alleviate sediment loadings and reduce runoff. Partial mitigation of increased runoff from new highway surfaces by providing for grassed road shoulders and limited use of ditching.
- Careful management and use of herbicides, pesticides, de-icing compounds, or other chemical constituents to minimize potential negative impacts on water quality. Roadside maintenance crews well versed in the use of these chemicals.
- Avoid direct discharges into streams whenever feasible. Filtering runoff effluent through roadside vegetation in order to remove contaminants and to minimize runoff velocities.

At this stage of the planning process, the need for stream relocation has not been determined, but seems unlikely.

3.0 BIOTIC RESOURCES

3.1 Terrestrial Communities

Terrestrial community descriptions are presented in the following sections describing existing plant communities (3.1.1) and wildlife (3.1.2). Impacts to terrestrial communities are discussed in Section 3.1.3.

3.1.1 Plant Communities

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past or present land use practices. Logging, farming, selective cutting, and natural succession after farming, fires, and other disturbances have resulted in the present vegetative patterns.

Three terrestrial plant communities were identified within the project study area and two additional communities (maintained/disturbed land and agricultural land) are the result of human activities. Plant community mapping is shown in Figure 4 in Appendix A. The plant community names have been adopted from the NCNHP classification system units (Schafale and Weakley 1990) and the descriptions written to reflect local variations within the project study area.

Piedmont/Mountain Bottomland Forest

This community is located north of SR 1347 along West Branch Mountain Creek and is dominated by hardwoods with few scattered pines. Typical canopy vegetation includes tulip poplar (*Liriodendron tulipifera*), American sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), river birch (*Betula nigra*), black willow (*Salix nigra*), black cherry (*Prunus serotina*), persimmon (*Diospyros virginiana*), and scattered Virginia pine (*Pinus virginiana*). Midstory vegetation includes sapling-sized overstory species as well as musclewood (*Carpinus caroliniana*), American holly (*Ilex opaca*), tag alder (*Alnus serrulata*), Chinese privet (*Ligustrum sinense*), eastern red cedar (*Juniperus virginiana*), and spicebush (*Lindera benzoin*). The sparse

herbaceous layer consists of wild onion (*Allium canadense*), Japanese honeysuckle (*Lonicera japonica*), common greenbrier (*Smilax rotundifolia*), Christmas fern (*Polystichum acrostichoides*), multiflora rose (*Rosa multiflora*), wild grape (*Vitis rotundifolia*), with scattered river oats (*Chasmanthium latifolium*), dog-hobble (*Leucothoe* sp.) and yellowroot (*Xanthorhiza simplicissima*).

Mesic Mixed Hardwood Forest (Piedmont subtype)

This community occupies the southwest corner and a portion of the northeast portion of the project study area. This community occurs on the north facing slopes within the project study area. These areas are characterized by mesophytic trees in the canopy with scattered Virginia pine. Typical overstory vegetation in these areas includes tulip poplar, American beech (*Fagus grandifolia*), northern red oak (*Quercus rubra*), mockernut hickory (*Carya tomentosa*), red maple, and scattered black cherry and eastern red cedar. Shrub vegetation occurring in these areas includes sapling-sized overstory species, as well as musclewood, flowering dogwood (*Cornus florida*), American holly, mountain laurel (*Kalmia latifolia*), wild hydrangea (*Hydrangea arborescens*), tag alder and scattered rhododendron (*Rhododendron* sp.). The herbaceous layer consists of blackberry (*Rubus* sp.), Christmas fern, multifora rose, Japanese honeysuckle, common greenbrier, groundpine (*Lycopodium* sp.), and scattered white pine (*Pinus strobus*) saplings.

Pine Woodland

This community occupies three small areas along the north side of SR 1347. These areas are most likely planted pine stands. The canopy is dominated by Virginia pine with a sparse understory of American beech, water oak (*Quercus nigra*), eastern red cedar, Japanese honeysuckle, and running cedar.

Maintained/Disturbed Land

Maintained/disturbed land occupies areas throughout the project study area. This community type includes roadsides, driveways, maintained residential yards, powerline easements, and other areas where human related activities dominate. Roadsides and powerline easements are irregularly maintained, receiving only periodic mowing and/or herbicide applications. Residential landscapes typically receive more frequent mowing and general maintenance. The roadsides and residential areas that are routinely maintained have a herbaceous species composition including fescue (*Festuca* sp.) and clover (*Trifolium* sp.). Trees documented within this community include Virginia pine, white pine, and white oak. Shrub vegetation occurring in these areas includes sapling-sized overstory species, eastern red cedar, and flowering dogwood. Outside of areas containing residential lawns, herbaceous vegetation includes blackberry, fescue, goldenrod (*Solidago* spp.), common greenbrier, broom-sedge (*Andropogon virginicus*), multiflora rose, Japanese honeysuckle, and smooth sumac (*Rhus glabra*).

Agricultural Land

Agricultural land occupies the majority of the project study area. Agricultural land is used for cultivation of row crops and field crops. Corn (*Zea mays*) is the primary crop noted within the project study area.

Table 1. Summary of Plant Communities.

Plant Community	Area (ac)	% of Project Study Area[a]
Piedmont/Mountain Bottomland Forest	1.5	3.7
Mesic Mixed Hardwood Forest	4.5	11.2
Pine Woodland	2.9	7.2
Maintained/Disturbed Land	8.3	20.6
Agricultural Land	21.6	53.6
Totals[b]:	38.8	96.3

[a] Project Study Area includes open area attributed to road surface (1.5 ac) (3.7 percent) not included in this plant community assessment.

[b] Plant community areas and percentages are calculated for the entire project study area (40.3 ac).

3.1.2 Terrestrial Fauna

Most of the project study area is rural in nature with small residential areas along SR 1347 and is dominated by maintained/disturbed land and agricultural land. Forested areas are present in the western and northeastern portions of the project study area, but clearing and conversion of tracts of land for timber, agricultural, and residential uses within the project study area have eliminated cover and protection for many species of wildlife, but have increased habitat for those able to utilize these anthropogenic habitats. The project study area provides little habitat for forest interior species, but the forested areas often serve as travel corridors between different habitat types. Residential and agricultural areas not only provide food for wildlife, but also create edge habitat favored by many species.

Mammal species documented within the project study area are the conspicuous larger and medium-sized species that have wide habitat tolerances and commonly occur in anthropogenic landscapes. Mammals documented within the project study area include white-tailed deer (*Odocoileus virginianus*) and eastern cottontail (*Sylvilagus floridanus*). Groundhog (*Marmota monax*) burrows and raccoon (*Procyon lotor*) tracks were observed along stream channels. Other medium-sized mammals with wide habitat tolerances expected to occur within the project study area include southern flying squirrel (*Glaucomys volans*), gray squirrel (*Sciurus carolinensis*), Virginia opossum (*Didelphis virginiana*), and gray fox (*Urocyon cinereoargenteus*).

No quantitative surveys were conducted to document the small mammal populations within the project study area. The forested communities in the project study area are expected to provide habitat for small mammals including insectivores such as northern short-tailed shrew (*Blarina brevicauda*) and rodents such as white-footed mouse (*Peromyscus leucopus*) and golden mouse (*Ochrotomys nuttalli*).

Avifaunal species found in the project study area are typical of maintained disturbed areas of North Carolina. Some birds are habitat specific, whereas others have more general habitat requirements.

Common resident bird species observed year-round throughout the project study area include species commonly occurring in both natural and anthropogenic habitats throughout western North Carolina. Several birds were documented within the project study area including great blue heron (*Ardea herodias*), American kestrel (*Falco sparverius*), mourning dove (*Zenaida macroura*), pileated woodpecker (*Dryocopus pileatus*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), eastern bluebird (*Sialia sialis*), American robin (*Turdus migratorius),* and northern cardinal (*Cardinalis cardinalis*). Other birds species expected to occur include northern flicker (*Colaptes auratus*), house finch (*Carpodacus mexicanus*), and American goldfinch (*Carduelis tristis*).

Due to the season in which the investigation was conducted, no summer resident bird species were documented within the project study area. Red-eyed vireo (*Vireo olivaceus*) and ovenbird (*Seiurus aurocapillus*) are common summer residents expected to be observed in a variety of forested communities. House wren (*Troglodytes aedon*), yellow warbler (*Dendroica petechia*), and indigo bunting (*Passerina cyanea*) are common summer residents expected to occur in shrubby habitats and along woodland edges similar to those prominent throughout the maintained/disturbed portion of the project study area.

No reptiles were documented within the project study area. Common reptiles expected to occur within the project study area include eastern box turtle (*Terrapene carolina*) and black racer (*Coluber constrictor*), which are two species that occupy a wide range of habitats. No amphibians were documented within the project study area. Common terrestrial or arboreal amphibians expected to occur within the project study area include American toad (*Bufo americanus*), Fowler's toad (*Bufo woodhousei*), and spring peeper (*Hyla crucifer).*

3.1.3 Impacts to Terrestrial Communities

Table 1 summarizes acreages of plant communities located within the project study area. Areas are based on a corridor width of approximately 700 ft. Functional designs are not available at this time, therefore actual impacts cannot be calculated. Actual impacts are anticipated to be restricted to the right-of-way width and will be less than the total acreages shown for the project study area. Maintained/disturbed land and agricultural land occupy the majority of the project study area. The replacement of Bridge No. 526 will impact the existing right-of-way and may potentially impact a small portion of the Piedmont/Mountain Bottomland Hardwood (Schafale and Weakley 1990) community associated with West Branch Mountain Creek. Impacts to forested areas should be minimized if practicable. Plant community mapping has been provided to NCDOT on an aerial photograph base (Figure 4 in Appendix A). The proposed project is

expected to have a minimal and temporary impact on wildlife populations compared to existing conditions.

3.2 Aquatic Communities

3.2.1 Aquatic Habitats

The aquatic habitats located within the project study area include West Branch Mountain Creek and an UTWBMC. There were no other aquatic habitat types, such as ponds or lakes within the project study area. No distinct areas containing significant amounts of aquatic vegetation were observed in the channels during the field investigation.

Visual observation and limited sampling of stream banks and channels within the project study area were conducted to document the aquatic habitat. Physical characteristics of project study area streams are presented in Section 2.2.2.

3.2.2 Aquatic Fauna

The aquatic habitat located within the project study area is comprised of West Branch Mountain Creek and the UTWBMC. The variety of flow characteristics, microhabitat, and substrate within these streams has the potential to support an array of species.

DWQ has not sampled any of the project study area streams as part of the NCIBI fish community structure study (DWQ 2004c). Fish species expected to occur within the project study area streams include, but are not limited to the rosyside dace (*Clinostomus funduloides*), Santee chub (*Cyprinella zanema*), bluehead chub (*Nocomis leptocephalus*), spottail shiner (*Notropis hudsonius*), yellowfin shiner (*Notropis lutipinnis*), sandbar shiner (*Notropis scepticus*), and fantail darter (*Etheostoma flabellare*) (Menhinick 1991, and Rohde 1994).

Streams within the project study area provide riparian and benthic habitat for a variety of amphibians and aquatic reptiles. No reptiles were observed within the project study area. Amphibians and reptiles expected to occur within aquatic habitats throughout the project study area include, but are not limited to seal salamander (*Desmognathus monticola*), slimy salamander (*Plethodon glutinosus*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), and queen snake (*Regina septemvittata*).

3.2.3 Impacts to Aquatic Communities

Stream channelization, scouring, siltation, sedimentation, and erosion from construction-related activities will affect water quality and biological constituents. Although direct impacts may be temporary, environmental impacts from these construction processes may result in long term or irreversible effects. Measures to maximize sediment and erosion control during construction in project study area streams will be implemented to protect water quality for aquatic organisms. These measures are discussed in Section 2.2.3. Bridges or culverts over streams should be designed to avoid or minimize impacts to stream flow and channel intensity. No impacts are anticipated to fish spawning habitat.

3.3 Rare and Unique Natural Areas

No rare or unique natural areas as identified by NCNHP occur within the project study area or within 1.0 mile of project study area (NCNHP 2004a).

4.0 JURISDICTIONAL AREAS

Section 404 of the Clean Water Act (CWA) requires regulation of discharges into "waters of the United States." Although the principal administrative agency of the CWA is the U.S. Environmental Protection Agency (EPA), the USACE has major responsibility for implementation, permitting, and enforcement of provisions of the Act. The USACE regulatory program is defined in 33 CFR 320-330.

Water bodies such as rivers, lakes and streams are subject to jurisdictional consideration under the Section 404 program. However, by regulation, wetlands are also considered "waters of the United States." Wetlands have been described as:

> Those areas that are inundated or saturated by groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. [33 CFR 328.3(b) (1986)]

The USACE requires the presence of three parameters (hydrophytic vegetation, hydric soils, and evidence of hydrology) in support of a jurisdictional determination.

4.1 Jurisdictional Wetland Descriptions

One wetland area occurs within the project study area. This jurisdictional wetland is classified as palustrine forested (PFO) as defined in Cowardin *et al.* (1979). Palustrine systems include all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5% (Cowardin *et al.* 1979). The wetland is small in areal extent. The soils are characterized by low chroma colors of 10YR 2/1 and 2.5Y 3/1 with 10YR 4/6 mottles. The hydrologic regime appears to be seasonally to semipermenantly flooded. Species present include sweetgum, tulip poplar, red maple, and sphagnum (*Sphagnum* sp.).

Some wetland systems are defined as palustrine but are hydrologically influenced by adjacent streams through periodic overbank flooding and are considered riparian wetlands. The riparian wetlands are commonly referred to as riverine wetlands, not to be confused with the Riverine system of Cowardin *et al.* (1979). Non-riparian wetlands are not typically influenced by overbank flooding and are commonly referred to as non-riverine wetlands. The project study area wetland is considered non-riparian. DWQ Wetland Rating Forms as well as USACE Routine Wetland Determination Data Forms are included in Appendix B.

4.2 Jurisdictional Stream Descriptions

There are two jurisdictional streams within the project study area. There are approximately 1,565 linear ft of perennial stream channel within the project study area, approximately 1,114 linear feet of West Branch Mountain Creek and 451 linear ft of UTWBMC. At the time of this report, the USACE has not made a jurisdictional determination on the importance of the project study area streams. ESI has included recommendations as to the important or unimportant stream designation based on the field investigation, however the final decision lies with the USACE. USACE and DWQ stream forms are included in Appendix B. Detailed stream descriptions can be found in Section 2.2.2. Actual impacts can not be quantified until an alignment has been selected and a functional design completed.

4.3 Potential Wetland and Stream Impacts

Descriptions of streams can be found in Section 2.2.2. Locations of jurisdictional areas are presented in Figure 3 (Appendix A). Jurisdictional areas present within the project study area are summarized in Table 2. The locations and extent of stream crossings can not be quantified until an alignment has been selected and a final design completed.

Table 2. Summary of Jurisdictional Areas.

WETLANDS				
		Area (ac)	**Percentage of Project Study Area[b]**	
PFO[a], Non-riparian		0.3	0.7	
TOTAL:		0.3	0.7	
SURFACE WATERS				
	Streams			
	Flow Characteristics		**Importance[c]**	
	Perennial R3 (linear ft)	Intermittent R4 (linear ft)	Important (linear ft)	Unimportant (linear ft)
	1,565	0	1,565	0
TOTAL:	1,565		1,565	

[a] Wetland Type: **PFO** palustrine, forested.
[b] Percentage of the Project Study Area (40.3 ac) that contains jurisdictional wetlands.
[c] Refers to the USACE designation of Important or Unimportant as described in Section 2.2.2.

Potential Impacts to Jurisdictional Wetlands

The jurisdictional wetland (W1) located within the project study area has been analyzed based on vegetation type (Cowardin Classification) and source of dominant hydrologic influence (riparian or non-riparian). Due to the size (0.3 acre) and location of W1, avoidance of all potential impacts to jurisdictional wetlands within the project study area should be possible.

Potential Impacts to Jurisdictional Streams

Jurisdictional streams located in the project study area have been analyzed based on three general characteristics: natural stream classification, flow characteristics (perennial or intermittent), and stream importance. These characteristics, especially stream importance, can be used to determine

the alignment that best avoids and minimizes impacts to jurisdictional streams. The project study area includes West Branch Mountain Creek and UTWBMC. These streams have been channelized or impacted by roads and agricultural land uses within the project study area. Both stream channels within the project study area have been designated as important by ESI based on the field investigation, however the final decision lies with the USACE. Stream importance is used to determine which stream channels, if impacted, will require mitigation by the USACE. There are 1,565 linear ft of important stream channel within the project study area; however, actual impacts cannot be quantified at this time. Detailed descriptions of streams within the project study area can be found in Section 2.2.2.

5.0 PERMITTING AND MITIGATION

5.1 Permits and Certifications Required

A final permitting strategy cannot be developed until an alignment is selected and construction impacts firmly established. However, permits are expected to be required if encroachment into stream channels and wetland results from bridge construction.

Section 404

In accordance with provisions of Section 404 of the CWA (33 U.S.C. 1344), a permit will be required from the USACE for the discharge of dredged or fill material into "waters of the United States."

Actual anticipated impacts to jurisdictional areas are not known at this time. Assuming avoidance and minimization of impacts to the greatest practicable extent, potential impacts may be authorized as under Nationwide Permit 23: Approved Categorical Exclusions (CE). Categorical Exclusions are activities, work, or discharges that are:

> "categorically excluded from environmental documentation, because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment" (DOA 2002).

Section 401

Section 401 of Clean Water Act (33 U.S.C. 1341) requires each state to certify that state water quality standards will not be violated for activities which: 1) involve issuance of a federal permit or license; or 2) require discharges to "waters of the United States." Depending upon the applicable Nationwide Permit, the use of a Section 404 permit will require the prior issuance of the 401 certification under General Certification No. 3403 (NWP 23). Under General Certification No. 3403, in accordance with 15A NCAC .0506, compensatory mitigation may be required for impacts to 150 linear ft or more of streams and/or 1.0 acre or more of wetlands. The NCDOT must apply to the DWQ for 401 certification as part of the permit process which is typically handled as a joint permit application to both the USACE and DWQ.

5.2 Mitigation Basis

Mitigation has been defined in National Environmental Policy Act (NEPA) regulations to include efforts which: a) avoid; b) minimize; c) rectify; d) reduce or eliminate; or e) compensate for adverse impacts to the environment [40 CFR 1508.20 (a-e)]. Mitigation of jurisdictional impacts is recommended in accordance with Section 404(b)(1) Guidelines of the CWA (40 CFR 230), Federal Highway Administration (FHWA) step-down procedures (23 CFR 777.1 *et seq.*), mitigation policy mandates articulated in the USACE/EPA Memorandum of Agreement (MOA), Executive Order 11990 (42 FR 26961) (1977), and USFWS mitigation policy directives (46 FR 7644-7663) (1981).

Section 404(b)(1) Guidelines, the USACE/EPA MOA, and Executive Order 11990, stress avoidance and minimization as primary considerations for protection of wetlands. Practicable alternatives analysis must be fully evaluated before compensatory mitigation can be discussed.

USFWS policy also emphasizes avoidance and minimization. However, for unavoidable losses, the USFWS recommends that mitigation efforts be based on the value and scarcity of the habitat at risk.

The FHWA policy stresses that all practicable measures should be taken to avoid or minimize harm to wetlands which will be affected by federally funded highway construction. A sequencing (step-down) procedure is recommended in the event that avoidance is impossible. The step-down procedure recommends that measures to avoid wetland and stream impacts be employed prior to attempting to minimize impacts and that mitigation can only be employed in the event that avoidance/minimization are demonstrated to not be practicable for the project. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

5.3 Mitigation Evaluation

Avoidance - Due to the location of surface waters within the project study area, avoidance of all jurisdictional impacts may not be possible. However, due to the size and location of the wetland within the project study area, avoidance of all jurisdictional wetlands should be possible. Although actual impacts to surface waters are not known at this time, potential jurisdictional impacts are previously discussed in Section 4.1. Impacts to the jurisdictional surface waters present can be avoided by bridging the stream channel, by avoiding construction activities in the stream channel, and by avoiding deposition into the stream channel during bridge construction.

Minimization – Minimization of jurisdictional stream impacts can be achieved by replacing Bridge No. 526 over West Branch Mountain Creek utilizing as much of the existing bridge alignment as possible and by bridging the stream high ground to high ground. Jurisdictional impacts can be further minimized by keeping all improvements east of UTWBMC, thus avoiding impacts to the UT all together. Both stream channels are relatively narrow, thus avoiding

construction activities and bridge beam placement within the channels would greatly minimize impacts. Extending already existing culverts and sensitive placement of drainage structures will minimize further degradation of water quality and reduce adverse impacts on aquatic habitat viability in these streams.

Compensatory mitigation - The need for compensatory mitigation is unlikely due to the size and location of the jurisdictional areas within the project study area. However, mitigation may be required for cumulative stream impacts greater than 150 linear ft and/or cumulative wetland impacts greater than 0.10 acre. A specific mitigation plan cannot be developed until final design is completed and actual impacts determined.

6.0 PROTECTED SPECIES ISSUES

6.1 Federal Protected Species

Species with the federal classification of Endangered (E), Threatened (T), or officially Proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973 (16 USC 1531 *et seq.*) as amended. Table 3 presents the federal protected species listed for Rutherford County (USFWS 2003). Descriptions of these federally protected species along with habitat requirements and biological conclusions for this project are presented following the table.

Table 3. Federally Listed Species (29 January 2003 USFWS list).

Common Name	Scientific Name	Federal Status[a]	Potential Habitat Present	Biological Conclusion
Indiana bat	*Myotis sodalis*	E[b]	No	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	Yes	No Effect
Small whorled pogonia	*Isotria medeoloides*	T	Yes	Unresolved-No Effect[c]
White irisette	*Sisyrinchium dichotomum*	E	No	No Effect
Rock gnome lichen	*Gymnoderma lineare*	E	No	No Effect

[a] E-Endangered: "taxon in danger of extinction throughout all or a significant portion of its range", T-Threatened: "taxon likely to become endangered within the foreseeable future throughout all or a significant portion of its range" (USFWS 2003).

[b] Winter records.

[c] The project study area contains potentially suitable habitat for this species, however if all impacts to the potential habitat areas are avoided or surveys are conducted during the appropriate flowering season (mid May – mid June), this species may receive a Biological Conclusion of No Effect.

Indiana bat – The Indiana bat is a small, brown bat measuring 3.0 to 3.6 inches in total length. The Indiana bat is distinguished from other eastern bats by having a keeled calcar (cartilaginous projection from the hind foot), relatively small ears that do not extend beyond the nose when pulled forward, short toe hairs that do not extend beyond the toes, and two tiny teeth in a gap between the canines and cheek teeth (Handley 1991).

Indiana bats hibernate in the winter in limestone caves usually where standing water is present (Webster *et al.* 1985). Indiana bats also use mine tunnels for hibernation (Handley 1991). In the

summer, males continue to roost in caves, but females in maternity colonies, normally roost under the loose bark of dead, large-diameter trees; however, living shagbark hickories (*Carya ovata*) and tree cavities are also used occasionally (Handley 1991).

BIOLOGICAL CONCLUSION: No Effect

No known occurrences of the Indiana bat have been documented within 3.0 miles of the project study area (NCNHP 2004a). No caves or large dead trees exist within the project study area. No impacts to Indiana bat populations are expected as a result of this project due to the absence of suitable habitat within the project study area.

Dwarf-flowered heartleaf - The dwarf-flowered heartleaf is a small, spicy-smelling, rhizomatous perennial herb with long-stalked leaves and flowers. Leaves are heart-shaped, evergreen, leathery, and dark green above and paler below; the upper leaf surface is often patterned with pale green reticulate mottles. The leaves grow to about 2.4 inches long and form a dense, spreading rosette. The flowers, which appear in April and May, are solitary, flask-shaped, fleshy and firm, and have three triangular lobes. This species differs from related species by having smaller flowers with calyx tubes that narrow distally rather than broaden (Kral 1983).

Dwarf-flowered heartleaf is found in acidic sandy loam soils on north-facing wooded slopes of ravines in the Piedmont of North and South Carolina. This species typically occurs in oak-hickory-pine forest where hydrologic conditions range from moist to relatively dry, but also may be present in adjacent pastured woodland. This species typically is found in moist duff at the bases of trees or mountain laurel (Kral 1983). In North Carolina, dwarf-flowered heartleaf is known from a few southwestern Piedmont counties (Amoroso 2002).

BIOLOGICAL CONCLUSION: No Effect

No known occurrences of the dwarf-flowered heartleaf have been documented within 3.0 miles of the project study area (NCNHP 2004a). Predominantly north facing slopes with scattered mountain laurel and rhododendron are present in the southwest corner of the project study area (See Figure 3 in Appendix A for potentially suitable habitat areas). A survey was conducted for individuals of the genus *Hexastylis*. No individuals of any heartleaf species were observed during searches of the potential habitat within the project study area. Due to the location and size of the potentially suitable habitat it should be possible to avoid impacts to these areas. No impacts to dwarf-flowered heartleaf populations are expected as a result of this project due to the absence of heartleaf species within the project study area.

Small whorled pogonia - The small whorled pogonia is a terrestrial orchid growing to about 10 inches high. Five or six drooping, pale dusty green, widely rounded leaves with pointed tips are arranged in a whorl at the apex of the greenish or purplish, hollow stem. Typically a single, yellowish green, nearly stalkless flower is produced just above the leaves; a second flower rarely may be present. Flowers consist of three petals, which may reach lengths of 0.7 inch, surrounded

by 3 narrow sepals up to 1 inch in length. Flower production, which occurs from May to July, is followed by the formation of an erect ellipsoidal capsule 0.7 to 1.2 inches in length (Massey *et al.* 1983). This species may remain dormant for periods up to 10 years between blooming periods (Newcomb 1977).

The small whorled pogonia is widespread, occurring from southern Maine to northern Georgia, but is very local in distribution. In North Carolina, this species is found in scattered locations in the Mountains, Piedmont, and Sandhills (Amoroso 2002). Small whorled pogonia is found in open, dry, deciduous or mixed pine-deciduous forests, or along stream banks. Examples of areas providing suitable conditions (open canopy and shrub layer with a sparse herb layer) where small whorled pogonia has been found include old fields, pastures, windthrow areas, cutover forests, old orchards, and semi-permanent canopy breaks along roads, streams, lakes, and cliffs (Massey *et al.* 1983). In the southern part of its range small whorled pogonia is typically associated with canopy species such as white pine, white oak, red maple, rock chestnut oak (*Quercus prinus*), and tulip poplar (USFWS 1992). Typical ground layer species associated with small whorled pogonia include Virginia creeper (*Parthenocissus quinquefolia*), cat-brier (*Smilax glauca*), and Christmas fern (USFWS 1992).

BIOLOGICAL CONCLUSION: Unresolved/No Effect

No known occurrences of the small whorled pogonia have been documented within 3.0 miles of the project study area (NCNHP 2004a). Open canopy habitat with a sparse herb layer is present within the project study area in the northeast portion and the southwest corner (Mesic Mixed Hardwood Forest) of the project study area (See Figure 4 in Appendix A for potentially suitable habitat areas). If impacts to these areas are unavoidable, surveys will need to be conducted during the appropriate flowering season (mid-May to mid-June) to determine the presence or absence of small whorled pogonia. However, due to the location and size of the potentially suitable habitat it may be possible to avoid all impacts to these areas. If these areas can be avoided a Biological Conclusion of No Effect can be given for small whorled pogonia. The Biological Conclusion for small whorled pogonia is Unresolved until the final alignment is established and surveys conducted, if needed.

White irisette- The white irisette is a perennial herb in the iris family that grows to 16 inches tall. Stem leaves are at least as wide as the winged stem and may reach 5.5 inches long and 0.20 inch wide. Basal leaves reach one-third to one-half the height of the plant and may be up to 7.5 inches long and 0.14 inch wide. White irisette differs from other blue-eyed grasses by having three to five nodes with successively shorter internodes between dichotomous branches (USFWS 1995). Four to six flowers with white, recurved perianth units are borne per spathe. Flowering occurs from late May through July.

White irisette is found in dry to mesic, open oak-hickory forest on mid-elevation mountain slopes at elevations from 1300 to 3300 ft above mean sea level with aspects ranging primarily from

southeast to southwest (USFWS 1995). White irisette grows in shallow, circumneutral soils, especially over weathered amphibolite. White irisette is reported to grow best on regularly disturbed sites, such as power lines, roadsides, and woodland edges, which mimic suppressed natural disturbances and maintain open habitat (USFWS 1995). The current distribution is restricted to Henderson, Polk, and Rutherford Counties in North Carolina (Amoroso 2002) and Greenville County in western South Carolina.

BIOLOGICAL CONCLUSION: No Effect

No known occurrences of white irisette have been documented within 3.0 miles of the project study area (NCNHP 2004a). White irisette is found on mid-elevation mountain slopes at heights greater than those found within the project study area. No impacts to white irisette populations are expected as a result of this project due to the absence of suitable habitat within the project study area.

Rock gnome lichen - The rock gnome lichen is a small, squamulose (strap-like) lichen in the reindeer moss (lichen) family. This species is similar to squamulose lichens in the genus *Cladonia* by having terminal portions of its strap-like lobes that are blue-gray on the upper surface and shiny-white on the lower surface; rock gnome lichen differs from these other lichens by having blackened lobe bases. The lichen grows nearly parallel to the rock surface to which it is attached, but the tips curl up to a near vertical orientation. Reproduction appears to be asexual, with colonies spreading clonally. Rock gnome lichen is typically found growing in association with a distinctively colored, reddish-brown moss (*Andreaea* sp.) (USFWS 1997).

The rock gnome lichen is endemic to the mountains of North Carolina and Tennessee. Most populations occur above 5,000 ft above mean sea level in elevation in areas subject to frequent fog cover, but this species has been found at lower elevations in deep gorges where a similar high humidity regime is present (USFWS 1997). Rock gnome lichen typically occurs on vertical rock faces subject to intermittent seepage (USFWS 1997).

BIOLOGICAL CONCLUSION: No Effect

No known occurrences of rock gnome lichen have been documented within 3.0 miles of the project study area (NCNHP 2004a). Elevations within the project study area are generally between 960 ft and 1,000 ft above mean sea level, well below the reported elevational distribution of this species. No vertical rock faces subject to intermittent seepage occur within the project study area. No impacts to the rock gnome lichen are expected as a result of this project due to lack of suitable habitat.

Federal Species of Concern

The 29 January 2003 USFWS list, also includes a category of species designated as "Federal Species of Concern" (FSC) (USFWS 2003). The FSC designation provides no federal protection under the ESA for the species listed. However, these are listed since they may attain federally protected status in the future. The project study area has been evaluated for the presence/absence of potential habitat for FSC species. See Table 4 for the FSC species listed for Rutherford County.

Table 4. Federal Species of Concern (FSC) (29 January 2003 USFWS list).

Common Name	Scientific Name	State Designation[a]	Potential Habitat[b]
Green salamander	*Aneides aneus*	E	No
Cerulean warbler	*Dendroica cerulea*	SR	No
Eastern small-footed myotis	*Myotis leibii*	SC	No
Southern Applachian woodrat	*Neotoma floridana haematoreia*	SC	No
Northern pine snake	*Pituophis melanoleucus melanoleucus*	SC	No
Butternut	*Juglans cinerea*	W5A	No
Sweet pinesap	*Monotropsis odorata*	SR-T	Yes
Carolina saxifrage	*Saxifraga caroliniana*	SR-T	No
Divided-leaf ragwort	*Senecio millefolium*	T	No
Mountain catchfly**	*Silene ovata*	SR-T	No
Granite dome goldenrod	*Solidago simulans*	SR-L	No

[a] E-Endangered; SC-Special Concern: "Any species of wild animal or once-native to N.C. which is determined by WRC to require monitoring but which may be taken under regulation adopted under the provisions of Article 25 of Chapter 113 of the General Statutes; 1987"; SR-Significantly Rare: Species which are very rare in North Carolina with 1-20 populations in the state; SR-L-Significantly Rare–Limited: The range of the species is limited to N.C and adjacent states; SR -T-Significantly Rare-Throughout: Species which are rare throughout their ranges; and W5A–Watch Category 5A (rare because of severe decline) (NCNHP 2004b).

[b] Proposed habitat based extensively on Amoroso (2002), LeGrand *et al.* (2001), and other literature previously cited.

** Obscure Record – date and/or location of observation is uncertain.

According to NCNHP records, no FSC species have been documented in the project study area or within 3.0 miles of the project study area (NCNHP 2004b).

6.2 State Protected Species

Species of mammals, birds, reptiles, amphibians, and plants with the North Carolina status of Endangered (E), Threatened (T), and Special Concern (SC) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202.12 *et seq.*). A review of the NCNHP records indicate that no state listed species have been documented in the project study area or within 3.0 miles of the project study area (NCNHP 2004a).

7.0 RECOMMENDATIONS

The project study area contains two streams, totaling 1,565 linear ft of stream channel, and one wetland (0.3 acre) that could potentially be impacted by the proposed project. Avoidance of impacts to jurisdictional areas should be considered during project design. Due to their locations, all impacts to UTWBMC and the jurisdictional wetland can likely be avoided. West Branch Mountain Creek is relatively narrow, therefore construction activities and bridge beam placement within the channel may not be necessary and could avoid and/or minimize impacts. Careful placement of drainage structures will minimize further degradation of water quality and reduce adverse impacts on aquatic habitat viability in the project study area streams. Permits likely to be required for this project are a Section 404 NWP No. 23 along with corresponding Section 401 Water Quality Certification No. 3403 due to the limited amount of impacts to jurisdictional areas.

There are five Federally Listed Species that have recorded ranges that extend into Rutherford County. The replacement of Bridge No. 526 will have No Effect on the Indiana bat, white irisette, and rock gnome lichen due to the lack of potentially suitable habitat. However, the project study area does contain potentially suitable habitat for dwarf-flowered heartleaf and small whorled pogonia. No impacts to dwarf-flowered heartleaf populations are expected as a result of this project due to the absence of any species of Hexastylis within the project study area. If all impacts to the Mesic Mixed Hardwood Forest (Schafale and Weakley 1990) are avoided, the Biological Conclusion of No Effect can be reached for small whorled pogonia. Due to the nature of the project and the location of the potentially suitable habitat for small whorled pogonia, impacts to these areas can likely be avoided. However, if impacts to this community is unavoidable, surveys will need to be conducted during the appropriate flowering season (mid May - mid June) to determine the presence or absence of small whorled pogonia.

Impacts to natural communities, jurisdictional areas, and potential Threatened and Endangered Species habitat can be avoided or greatly minimized by aligning construction east of UTWBMC and by making bridge improvements and placing staging areas downstream of the existing bridge on the south side of SR 1347.

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Appendix A
Figures

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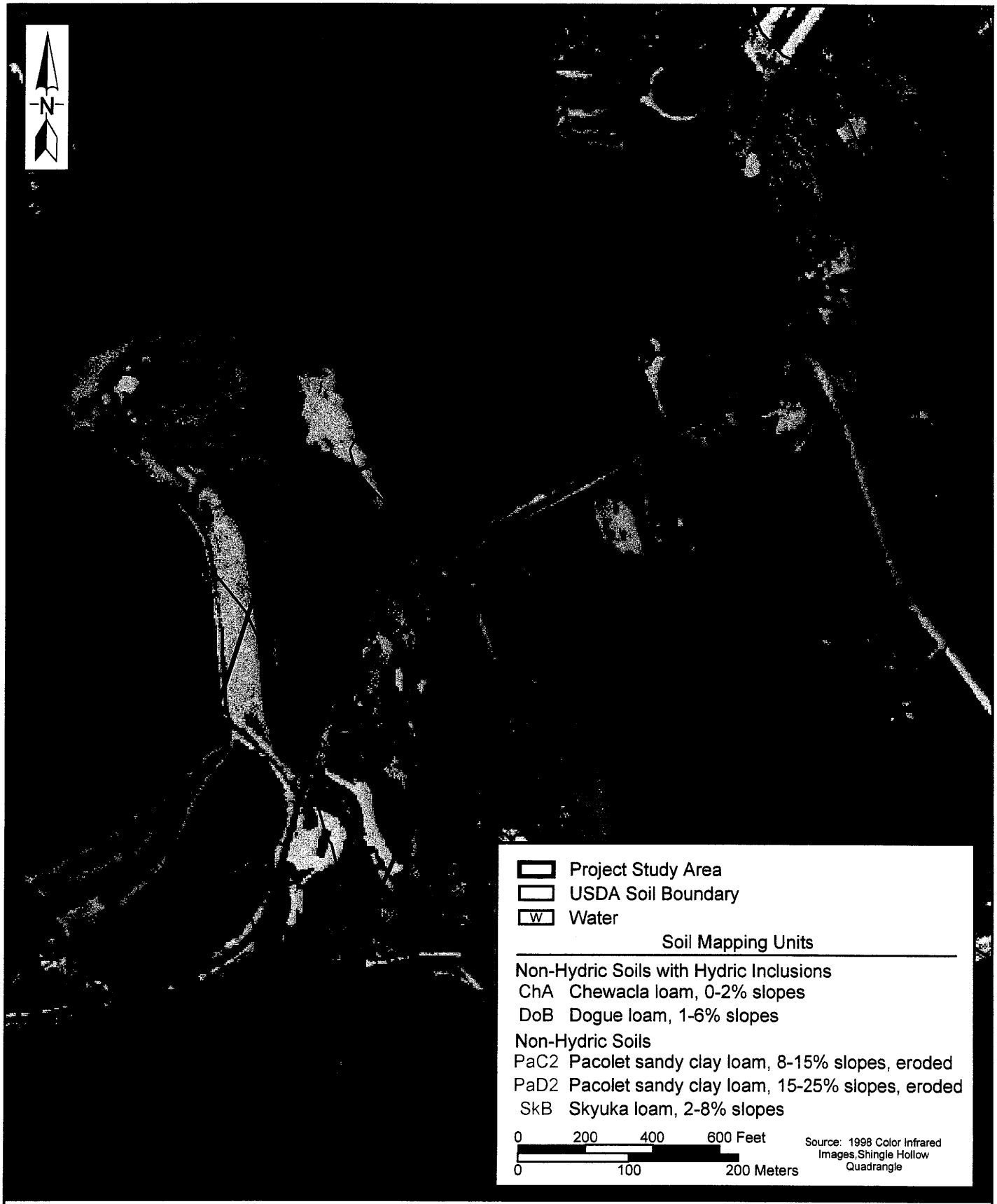

Environmental Services, Inc.

Project Soils
Bridge No. 526 on SR 1347
over West Branch Mountain Creek
Rutherford County, North Carolina
T.I.P. B-4631

Figure:	2
Project:	ER02026.03
Date:	August 2004

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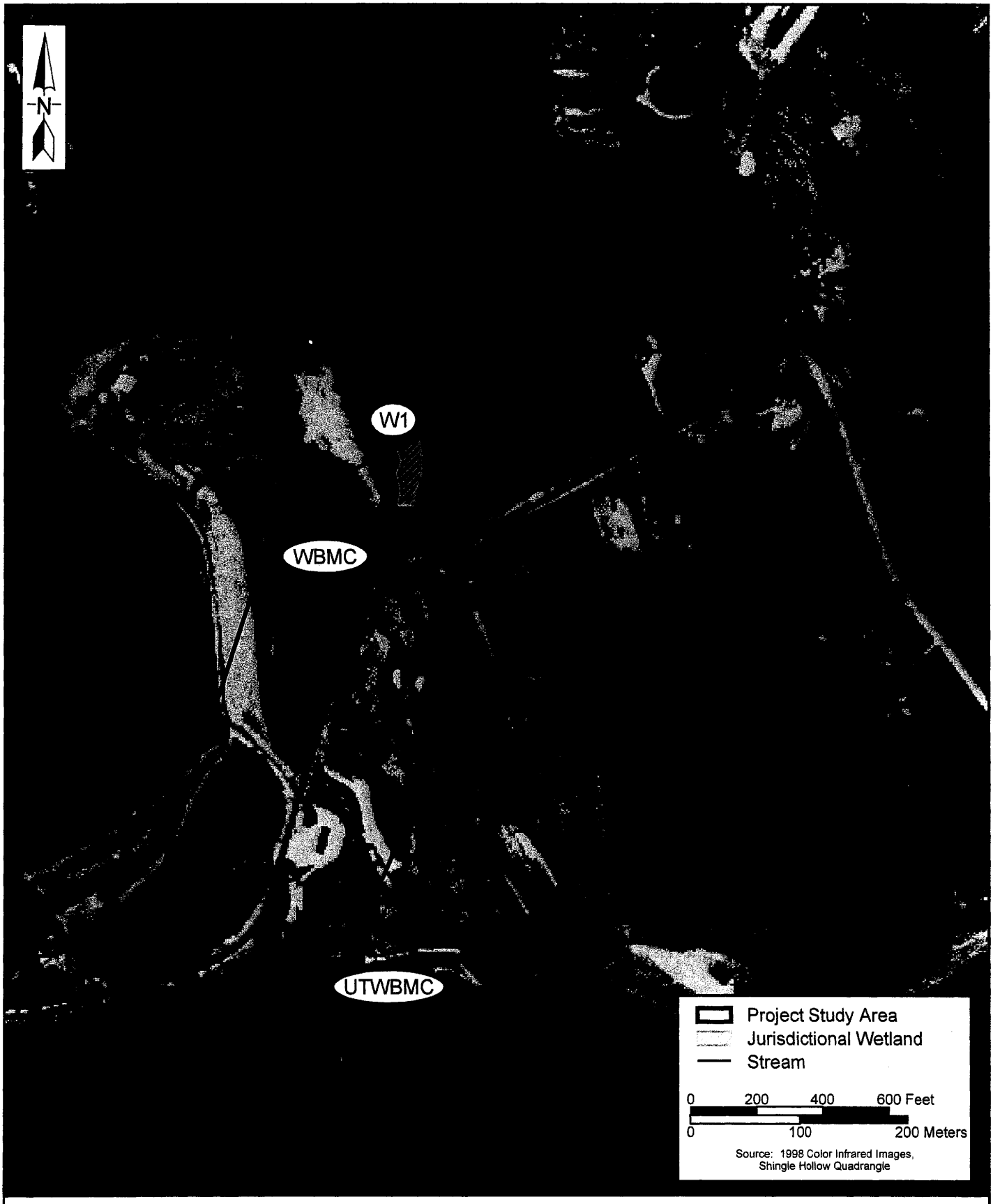

Environmental Services, Inc.

Jurisdictional Areas
Bridge No. 526 on SR 1347
over West Branch Mountain Creek
Rutherford County, North Carolina
T.I.P. B-4631

Figure:	3
Project:	ER02026.03
Date:	August 2004

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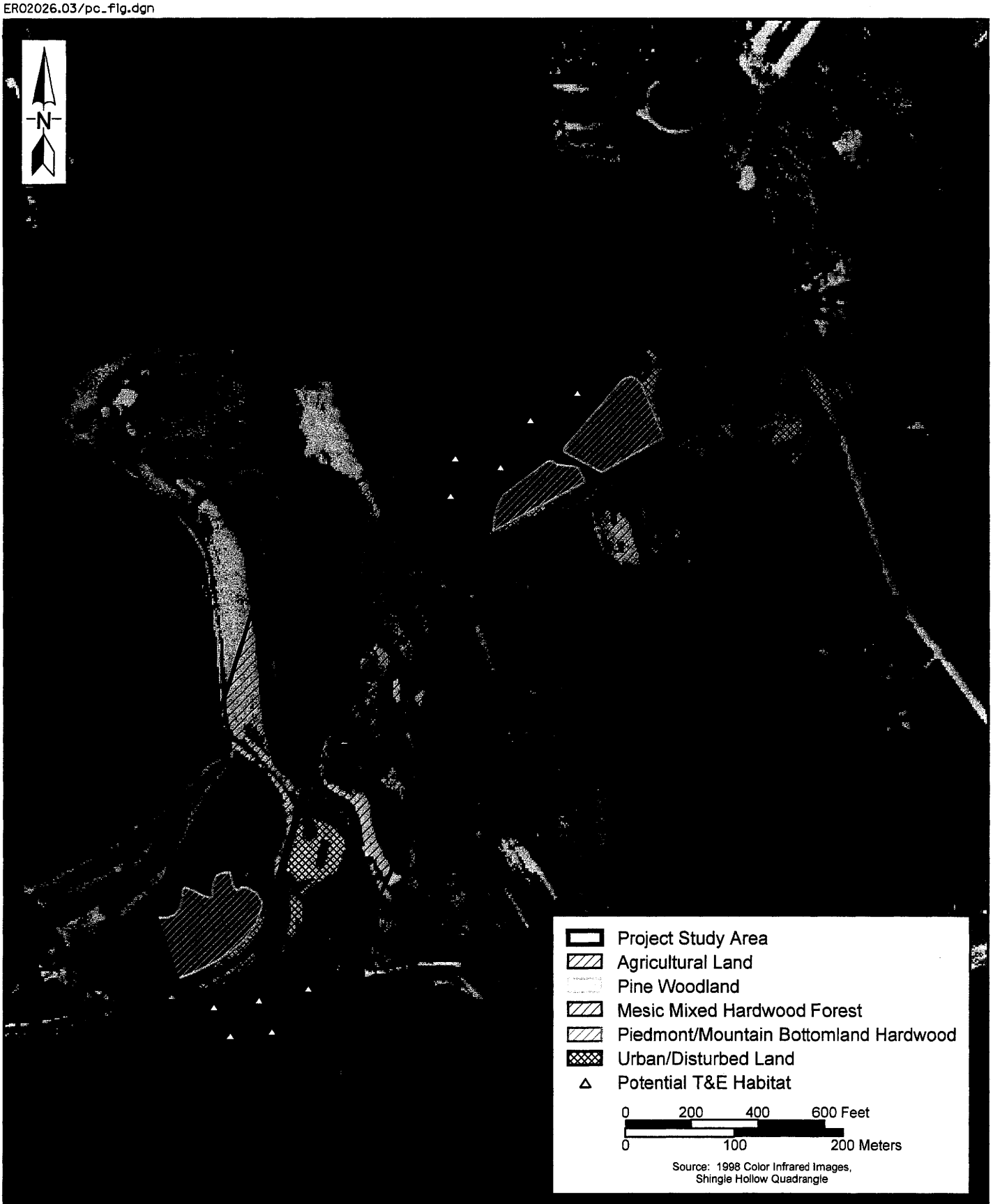

Environmental Services, Inc.

Plant Communities and Potential T&E Habitat
Bridge No. 526 on SR 1347
over West Branch Mountain Creek
Rutherford County, North Carolina
T.I.P. B-4631

Figure:	4
Project:	ER02026.03
Date:	August 2004

Appendix B
Data Forms

WI

DATA FORM GA wet

ROUTINE WETLAND DETERMINATION

(1987 CE Wetlands Delineation Manual)

Project/Site: B-4631	Date: 3/26/2004
Applicant/Owner: NCDOT	County: Rutherford
Investigator: Environmental Services, Inc. (ESI), TJM	State: NC
Do normal circumstances exist on the site? ☑ Yes ☐ No	Community ID: forested
Is the site significantly disturbed (atypical situation)? ☐ Yes ☑ No	Transect ID: GA-14
Is the area a potential problem area (If needed, explain)? ☐ Yes ☑ No	Data Point #: wet

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. sweetgum *Liquidambar styraciflua*	tree	FAC+	7. *#N/A*	#N/A	#N/A
2. tulip poplar *Liriodendron tulipifera*	tree	FAC	8. *#N/A*	#N/A	#N/A
3. red maple *Acer rubrum*	tree	FAC	9. *#N/A*	#N/A	#N/A
4. grass sp.	herb	0	10. *#N/A*	#N/A	#N/A
5. *#N/A*	#N/A	#N/A	11. *#N/A*	#N/A	#N/A
6. *#N/A*	#N/A	#N/A	12. *#N/A*	#N/A	#N/A

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-): 75%

Remarks The hydrophytic criterion has been met. Sphagnum moss dominant in wetland.

HYDROLOGY

☐ RECORDED DATA (DESCRIBE IN REMARKS):

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ NO RECORDED DATA AVAILABLE

FIELD OBSERVATIONS

Depth of Surface Water: 0

Depth to Free Water in Pit: 6"

Depth to Saturated Soil: 0"

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☑ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☑ Sediment Deposits
- ☑ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☑ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrologic criterion has been met.

W1

DATA FORM GA up

ROUTINE WETLAND DETERMINATION

(1987 CE Wetlands Delineation Manual)

Project/Site: B-4631	Date: 3/26/2004
Applicant/Owner: NCDOT	County: Rutherford
Investigator: Environmental Services, Inc. (ESI), TJM	State: NC
Do normal circumstances exist on the site? ☑ Yes ☐ No	Community ID: forested
Is the site significantly disturbed (atypical situation)? ☐ Yes ☑ No	Transect ID: GA-14
Is the area a potential problem area (If needed, explain)? ☐ Yes ☑ No	Data Point #: up

VEGETATION

DOMINANT PLANT SPECIES	STRATUM	INDICATOR	DOMINANT PLANT SPECIES	STRATUM	INDICATOR
1. white oak *Quercus alba*	tree	FACU	7. *#N/A*	#N/A	#N/A
2. ironwood *Carpinus caroliniana*	tree	FAC	8. *#N/A*	#N/A	#N/A
3. american holly *Ilex opaca var. opaca*	tree	FAC-	9. *#N/A*	#N/A	#N/A
4. virginia pine *Pinus virginiana*	tree	UPL	10. *#N/A*	#N/A	#N/A
5. honeysuckle *Lonicera japonica*	vine	FAC-	11. *#N/A*	#N/A	#N/A
6. *#N/A*	#N/A	#N/A	12. *#N/A*	#N/A	#N/A

Percent of dominant species that are OBL, FACW, or FAC (Excluding FAC-): 20%

Remarks The hydrophytic criterion has not been met.

HYDROLOGY

☐ RECORDED DATA (DESCRIBE IN REMARKS):

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☑ NO RECORDED DATA AVAILABLE

FIELD OBSERVATIONS

Depth of Surface Water: 0

Depth to Free Water in Pit: >18"

Depth to Saturated Soil: 15"

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: The hydrologic criterion has not been met.

UTWBMC

NCDWQ Stream Classification Form

Project Name: B-4631 River Basin: BROAD RIVER County: RUTHERFORD Evaluator: ESI (TJM)
DWQ Project No.: Nearest Named Stream: WEST BRANCH Latitude: Signature:
Date: 3/26/04 USGS Quad: SHINGLE HOLLOW Longitude: Location/Direction:

PLEASE NOTE: If evaluator and landowner agree that the feature is a man-made ditch, then the use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream-this rating system should not be used

PRIMARY FIELD INDICATORS: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is there a Riffle-Pool Sequence?	0	1	(2)	3
2) Is the USDA Texture in Streambed Different From Surrounding Terrain?	0	1	(2)	3
3) Are Natural Levees Present?	(0)	1	2	3
4) Is the Channel Sinuous?	0	1	(2)	3
5) Is There Active (or Relic)) Floodplain Present?	(0)	1	2	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	1	2	(3)
8) Is There a Bankfull Bench?	0	1	(2)	3
9) Is A Continuous Bed & Bank Present?	0	1	2	(3)
	Note: If Bed & Bank Caused By Ditching And W/O Sinuosity Then Score =0			
10) Is A 2nd Order or Greater Channel (As Indicated on USGS and/or In Field) Present?	Yes=3			(No=0)

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: 14

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/ Discharge Present?	0	1	2	(3)

PRIMARY HYDROLOGY INDICATOR POINTS: 3

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present in the Streambed?	(3)	2	1	0
2) Are Rooted Plants Present In the Streambed?	(3)	2	1	0
3) Is Periphyton Present?	0	1	(2)	3
4) Are Bivalves Present?	(0)	1	2	3

PRIMARY BIOLOGICAL INDICATOR POINTS: 8

TOTAL PRIMARY INDICATOR POINTS: 25

UTNBMC

USACE AID#_____ DWQ #_____ Site #____ (indicate on attached map)

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT B-4631
2. Evaluator's name: ESI (GT)
3. Date of evaluation: 3/24/04
4. Time of evaluation: 2:00
5. Name of stream: UT to West Branch Mountain Creek
6. River basin: Broad River
7. Approximate drainage area: _____
8. Stream order: 1st
9. Length of reach evaluated: 500'
10. County: Rutherford
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any): _____

Latitude (ex. 34.872312): _____ Longitude (ex. -77.556611): _____

Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other _____

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): SR 1347

14. Proposed channel work (if any): unknown

15. Recent weather conditions: clear

16. Site conditions at time of visit: clear

17. Identify any special waterway classifications known: ___Section 10 ___Tidal Waters ___Essential Fisheries Habitat ___Trout Waters ___Outstanding Resource Waters ___ Nutrient Sensitive Waters ___Water Supply Watershed ____(I-IV)

18. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 1 acre

19. Does channel appear on USGS quad map? YES NO

20. Does channel appear on USDA Soil Survey? YES NO

21. Estimated watershed land use: 5% Residential ___% Commercial ___% Industrial 25% Agricultural 50% Forested 20% Cleared / Logged ___% Other (_____)

22. Bankfull width: 1.5'

23. Bank height (from bed to top of bank): 0.5'

24. Channel slope down center of stream: ___Flat (0 to 2%) ___Gentle (2 to 4%) ✓Moderate (4 to 10%) ___Steep (>10%)

25. Channel sinuosity: ____Straight ___Occasional bends ✓Frequent meander ___Very sinuous ___Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 47 **Comments:** _____

Evaluator's Signature Brenda C. Dyar Date 3/24/04

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

UTWBMC

STREAM QUALITY ASSESSMENT WORKSHEET

West Branch UT to Mountain Creek

	#	CHARACTERISTICS	ECOREGION POINT RANGE Coastal	Piedmont	Mountain	SCORE
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	2
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	3
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	5
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	3
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				47

* These characteristics are not assessed in coastal streams.

WBMC

NCDWQ Stream Classification Form

Project Name: B 4631 River Basin: Broad River County: Rutherford Evaluator: ES

DWQ Project Number: Nearest Named Stream: West Branch Mountain Creek Latitude: Signature: ET

Date: 3/24/04 USGS QUAD: Shingle Hollow Longitude: Location/Directions: SR 1347

PLEASE NOTE:** ***If evaluator and landowner agree that the feature is a man-made ditch, then use of this form is not necessary. Also, if in the best professional judgement of the evaluator, the feature is a man-made ditch and not a modified natural stream—this rating system should not be used*

Primary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Riffle-Pool Sequence?	0	1	2	(3)
2) Is The USDA Texture In Streambed Different From Surrounding Terrain?	0	1	2	(3)
3) Are Natural Levees Present?	0	1	(2)	3
4) Is The Channel Sinuous?	0	1	2	(3)
5) Is There An Active (Or Relic) Floodplain Present?	0	1	(2)	3
6) Is The Channel Braided?	(0)	1	2	3
7) Are Recent Alluvial Deposits Present?	0	1	(2)	3
8) Is There A Bankfull Bench Present?	0	1	(2)	3
9) Is a Continuous Bed & Bank Present? *(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*	0	1	2	(3)
10) Is a 2nd Order Or Greater Channel (As Indicated On Topo Map *And/Or* In Field) Present?	*Yes*=(3)		*No*=0	

PRIMARY GEOMORPHOLOGY INDICATOR POINTS: ____

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is There A Groundwater Flow/Discharge Present?	0	1	(2)	3

PRIMARY HYDROLOGY INDICATOR POINTS: 23

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fibrous Roots Present In Streambed?	(3)	2	1	0
2) Are Rooted Plants Present In Streambed?	(3)	2	1	0
3) Is Periphyton Present?	0	(1)	2	3
4) Are Bivalves Present?	(0)	1	2	3

PRIMARY BIOLOGY INDICATOR POINTS: 7

Secondary Field Indicators: (Circle One Number Per Line)

I. Geomorphology	Absent	Weak	Moderate	Strong
1) Is There A Head Cut Present In Channel?	(0)	.5	1	1.5
2) Is There A Grade Control Point In Channel?	(0)	.5	1	1.5
3) Does Topography Indicate A Natural Drainage Way?	0	.5	(1)	1.5

SECONDARY GEOMORPHOLOGY INDICATOR POINTS: 1

WBMC

USACE AID#_____ DWQ #_____ Site #____ (indicate on attached map)

STREAM QUALITY ASSESSMENT WORKSHEET

Provide the following information for the stream reach under assessment:

1. Applicant's name: NCDOT B-4631
2. Evaluator's name: ESI (GT)
3. Date of evaluation: 3/24/04
4. Time of evaluation: 1:00
5. Name of stream: West Branch Mountain Creek
6. River basin: Broad River
7. Approximate drainage area: _____
8. Stream order: 2nd
9. Length of reach evaluated: 500'
10. County: Rutherford
11. Site coordinates (if known): prefer in decimal degrees.
12. Subdivision name (if any): _____

Latitude (ex. 34.872312): _____ Longitude (ex. -77.556611): _____

Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other _____

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): SR 1347

14. Proposed channel work (if any): Unknown

15. Recent weather conditions: Clear

16. Site conditions at time of visit: Clear

17. Identify any special waterway classifications known: ___Section 10 ___Tidal Waters ___Essential Fisheries Habitat ___Trout Waters ___Outstanding Resource Waters ___ Nutrient Sensitive Waters ___Water Supply Watershed ____(I-IV)

18. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: Large

19. Does channel appear on USGS quad map? YES NO

20. Does channel appear on USDA Soil Survey? YES NO

21. Estimated watershed land use: 5 % Residential ___% Commercial ___% Industrial 25 % Agricultural 50 % Forested 20 % Cleared / Logged ___% Other (_____)

22. Bankfull width: 15'

23. Bank height (from bed to top of bank): 2-6'

24. Channel slope down center of stream: ___Flat (0 to 2%) ✓Gentle (2 to 4%) ___Moderate (4 to 10%) ___Steep (>10%)

25. Channel sinuosity: ____Straight ___Occasional bends ✓Frequent meander ___Very sinuous ___Braided channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 55 **Comments:** _____

Evaluator's Signature Brenda G. Lyons **Date** 3/24/04

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

WBMC

STREAM QUALITY ASSESSMENT WORKSHEET

West Branch Mountain Creek

	#	CHARACTERISTICS	ECOREGION POINT RANGE Coastal	Piedmont	Mountain	SCORE
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	1
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture, livestock, or timber production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	5
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	2
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (see page 4) (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	4
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
		Total Points Possible	100	100	100	
		TOTAL SCORE (also enter on first page)				55

* These characteristics are not assessed in coastal streams.