CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	B-4157
State Project No.	8.2822701
W.B.S. No.	33505.1.1
Federal Project No.	BRZ-1581(2)

A. Project Description:

The purpose of this project is to replace Iredell County Bridge No. 140 on SR 1581, over Snow Creek. The replacement structure will be a new bridge of approximately 156 feet in length and 33 feet in width. The new bridge will have a 30-foot travelway accommodating two 12-foot lanes, and will have 3-foot offsets on each side. The roadway grade of the new structure will be placed at an elevation approximately four feet higher than the existing grade at this location.

The approach roadway, extending approximately 590 feet from the west end of the bridge and approximately 610 feet from the east end of the bridge, will be widened to a 24-foot pavement width providing two 12-foot lanes. Six-foot shoulders will be provided on each side (nine-foot shoulders where guardrail is included). The roadway will be designed as a Rural Local facility with a 60-mile per hour design speed.

Traffic will be detoured offsite during construction (see Figure 1).

B. Purpose and Need:

Bridge No. 140 includes a 6-span superstructure composed of a timber deck on steel I-beams. The substructure consists of timber caps and piles, with one abutment of mass concrete. The existing bridge, built in 1955, is 20.0 feet in width and 146 feet long.

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 43.7 out of a possible 100 for a new structure. Also, the bridge is considered functionally obsolete due to a deck geometry appraisal of 2 out of 9. Formerly, the bridge was also rated as structurally deficient, with a structural evaluation of 2 out of 9. After the bridge was included in the TIP program, this evaluation was upgraded due the addition of crutch bents. The bridge is currently considered deficient according to Federal Highway Administration (FHWA) guidelines, due to a sufficiency rating of 43.7 coupled with a rating of functionally obsolete. The bridge is therefore eligible for FHWA's Highway Bridge Replacement and Rehabilitation Program.

Timber bridge components typically do not last beyond 30 to 40 years of age due to the natural deterioration rates of wood. Past a certain degree of deterioration, structures with timber piles become impractical to maintain and are programmed for replacement, as is the case for this bridge. The bridge is nearing the end of its useful life.

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.

Studied Offsite Detour:

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 studied offsite detour for this project would include SR 1581, SR 1585, SR1583 and NC 115. The detour for the average road user would result in approximately four minutes additional travel time (3.6 miles additional travel) which falls within the "Acceptable" category for the duration of construction expected on this project. After consideration of other factors, including emergency medical services comments, school busses, the low volume of traffic, concurrence by Division 12, and potential costs, it was decided to utilize the offsite detour.

According to the Transportation Director for the Iredell County School System, there are three busses crossing the bridge twice each day. The school system will not have a problem functioning utilizing an offsite detour during construction.

Emergency Management Services states that temporary closure of the road should not create undue delays.

Alternatives Discussion:

Only one "build" alternative was studied. The "do nothing" alternate is not practical; requiring the eventual closing of the road as the existing bridge completely deteriorates. Rehabilitation of the existing bridge is neither practical nor economical.

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 any 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-tenth (1/10) acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	☐
(5) Will the project require use of U. S. Forest Service lands?	☐	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 and environmental grounds concerning aspects of the action?	☐	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

G. CE Approval

TIP Project No.	B-4157
State Project No.	8.2822701
W.B.S. No.	33505.1.1
Federal Project No.	BRZ-1581(2)

Project Description:

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Traffic will be detoured offsite during construction (see Figure 1).

Categorical Exclusion Action Classification: (Check one)

__X__ TYPE II(A)
_____ TYPE II(B)

Approved:

9-14-05 _____
Date — Project Planning Unit Head
Project Development and Environmental Analysis Branch

9-14-05 _____
Date — Project Planning Engineer
Project Development and Environmental Analysis Branch

For Type II(B) projects only:

_____ _____
Date — Division Administrator
Federal Highway Administration

ENVIRONMENTAL COMMITMENTS:

Iredell County
Bridge No. 140 on SR 1581
over Snow Creek
Federal Aid Project No. BRZ-1581(2)
State Project No. 8.2822701
W.B.S. No. 33505.1.1
T.I.P. No. B-4157

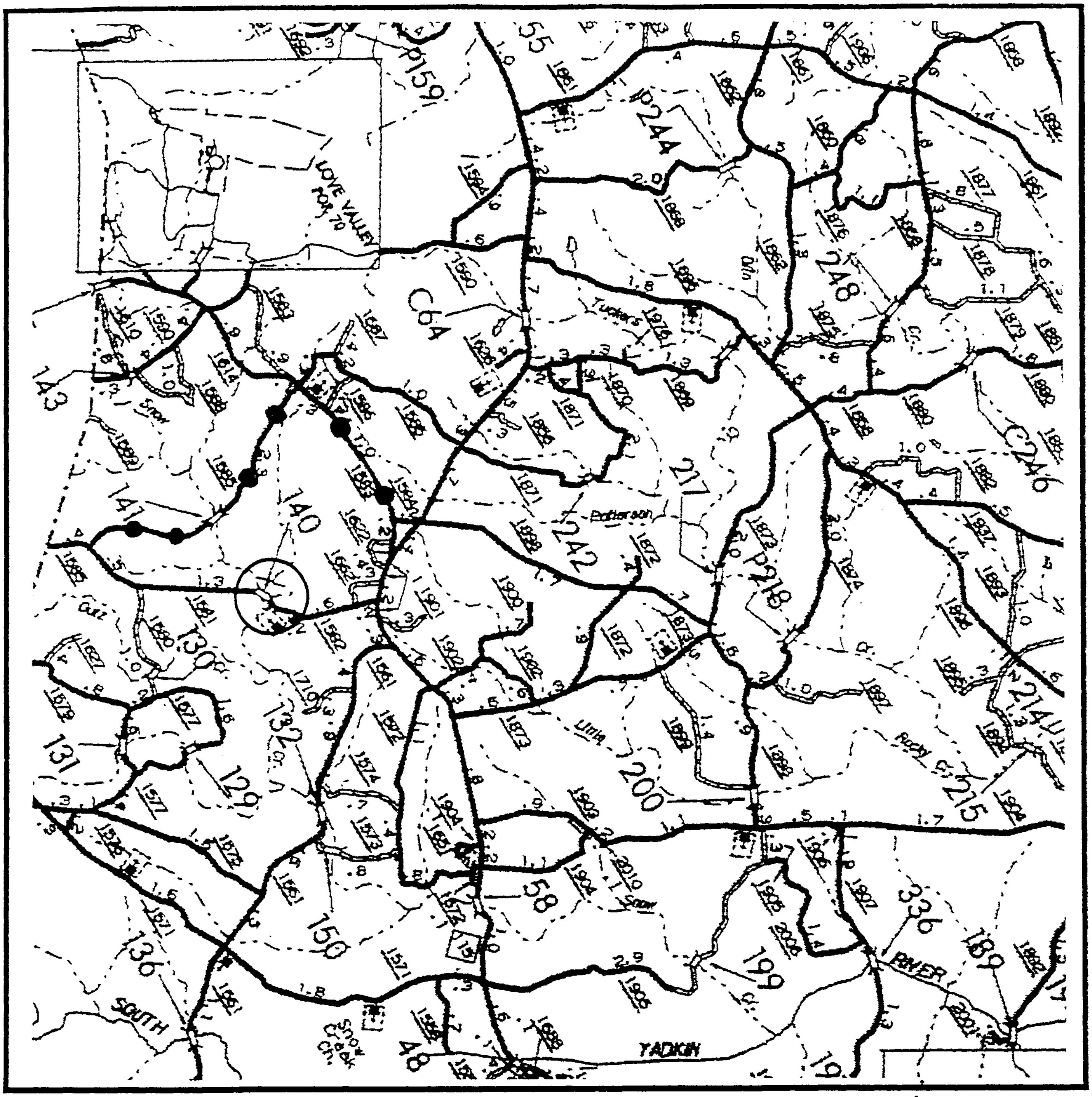
1. Roadway Design Unit, Structure Design Unit, Project Development & Environmental Analysis Branch (Permits), Resident Engineer:

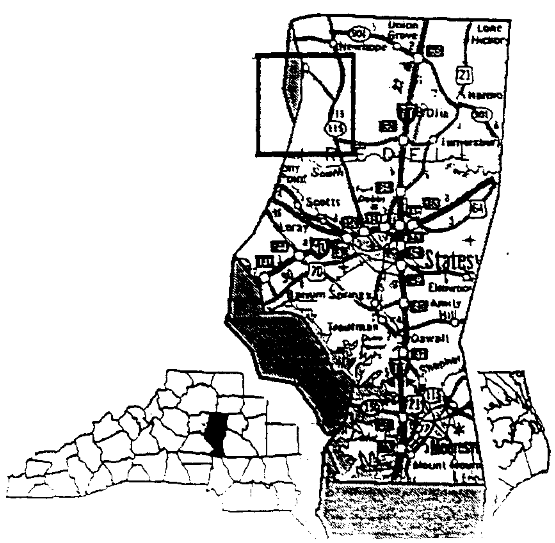
Bridge Demolition:

The existing bridge has an asphalt wearing surface, and the remainder of the bridge, both superstructure and substructure, is composed of timber and steel. The asphalt surface will be removed prior to demolition. The remainder of the bridge will be removed without dropping into Waters of the U.S. During construction, Best Management Practices for Bridge Demolition and Removal will be followed.

Sedimentation & Erosion Control:

Design and construction will comply with the latest issue of NCDOT Standards for Sensitive Watersheds.





Studied Detour Route

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

IREDELL COUNTY
REPLACE BRIDGE NO. 140 ON SR 1581
OVER SNOW CREEK
B-4157

Figure 1

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

Division of Historical Resources
David J. Olson, Director

May 9, 2003

MEMORANDUM

TO: Greg Thorpe, Manager
Project Development and Environmental Analysis Branch
NCDOT Division of Highways

FROM: David Brook Peggy for David Brook

SUBJECT: Replace Bridge No. 140 on SR 1581 over Snow, B-4157, Iredell County, ER03-0945

Thank you for your letter of April 7, 2003, concerning the above project.

We have conducted a search of our maps and files and located the following structure of historical or architectural importance within the general area of this project:

Damascus Baptist Church Arbor (ID 18) 0.1 mi. SE of junction SR 1581 and SR 1582

We recommend that a Department of Transportation architectural historian identify and evaluate any structures over fifty years of age within the project area, and report the findings to us.

There are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for conclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

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

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

cc: Mary Pope Furr

North Carolina Department of Cultural Resources
State Historic Preservation Office

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources
David L. S. Brook, Director

May 5, 2004

MEMORANDUM

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

FROM: David Brook per David Brook

SUBJECT: Replace Bridge No. 140 on SR 1581 over Snow Creek, B-4157, Iredell County, ER03-0945

Thank you for your e-mail of March 31, 2004, concerning the above project.

On April 6, 2004, Sarah McBride of our staff met with North Carolina Department of Transportation (NCDOT) staff concerning the above project. NCDOT provided area and aerial photographs at the meeting.

Based on our review of the photographs and information discussed at the meeting, we offer our comments regarding this project.

In terms of historic architectural resources, we are aware of no historic structures located within the area of potential effect. Therefore, we have no further comment on this project as proposed.

There are no known archaeological sites within the proposed project area. Based on our present knowledge of the area, it is unlikely that any archaeological resources, which may be eligible for inclusion in the National Register of Historic Places, will be affected by the project construction. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

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

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

cc: Mary Pope Furr
Dennis Pipkin, PDEA

FINAL

NATURAL RESOURCES TECHNICAL REPORT

Replacement of Bridge No. 140
on State Route 1581 over Snow Creek
Iredell County, North Carolina
(B-4157)
(State Project No. 8.2822701)
(Federal Aid Project No. BRZ-1581(2))

NCDOT Consulting Project No. 02-LO-01

The North Carolina Department of Transportation
Raleigh, North Carolina

February 2003

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APPENDIX

1.0 INTRODUCTION

1.1 Project Description

This project includes the replacement of Bridge No. 140 on State Route (SR) 1581 (Damascus Church Road) over Snow Creek in Iredell County, North Carolina (Figure 1). Bridge No. 140 is approximately 1.0 mile (1.6 kilometers) west of the Town of Central, and approximately 5,300 feet (1620 meters) west of the intersection of Damascus Church Road (SR 1581) with NC 115.

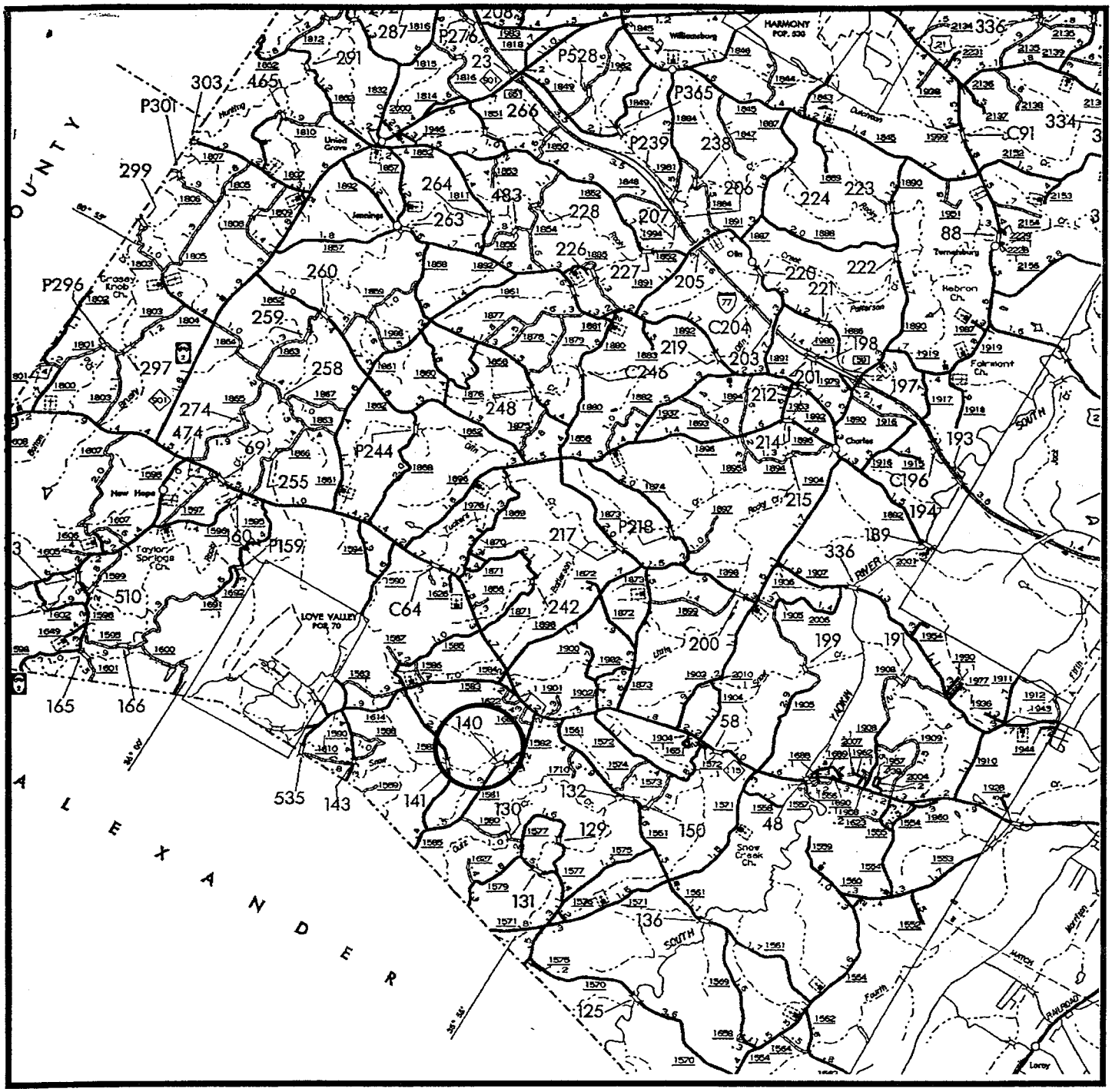
The existing bridge was built in 1955 and has a timber deck on steel I-beams with one mass concrete abutment and timber caps and piles. The proposed project will replace the existing bridge with an undetermined structure. A temporary detour to the north using NC 115, Mountain View Road (SR 1583), and Cattlemans Road (SR 1585) would eliminate the need for a temporary crossing during construction (Figure 2).

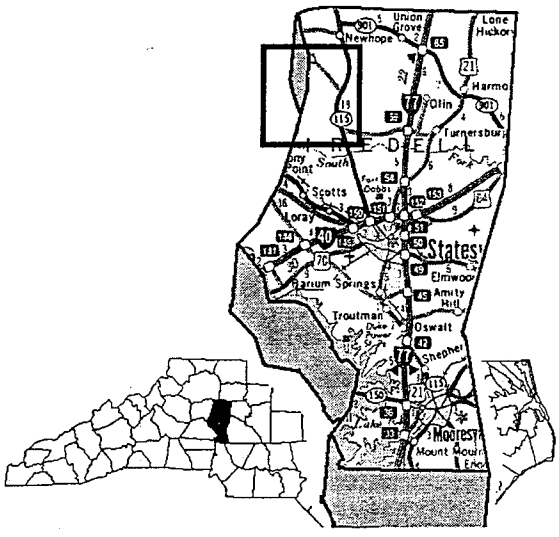
1.2 Definitions

A "bubble study" to obtain early environmental information for the project was undertaken since no alternatives for the replacement of the bridge have been developed at this time. The "bubble study" identifies a project study area around the existing structure to assist with the development of the project alternatives. The **project study area** is approximately 2,300 feet (720 meters) in length and approximately 400 feet (122 meters) in width. The **project vicinity** describes an area extending 0.5 mile (0.8 kilometer) on all sides of the project study area.

1.3 Purpose

The purpose of this Natural Resource Technical Report is to document this evaluation of existing natural resources in the project study area to assist with the development of project alternatives and the preparation of a Categorical Exclusion (CE). Specifically, the tasks performed for this report include: 1) an assessment of natural resource features within the project study area including descriptions of vegetation, wildlife, protected species, streams, wetlands, and water quality; 2) an evaluation of potential environmental impacts; 3) a preliminary assessment of on-site or adjacent mitigation potential; and 4) a preliminary determination of permit needs. The environmental impact analysis is based on potential impacts within the mapped project study area and does not take into account any specific limits for design, demolition, or construction.

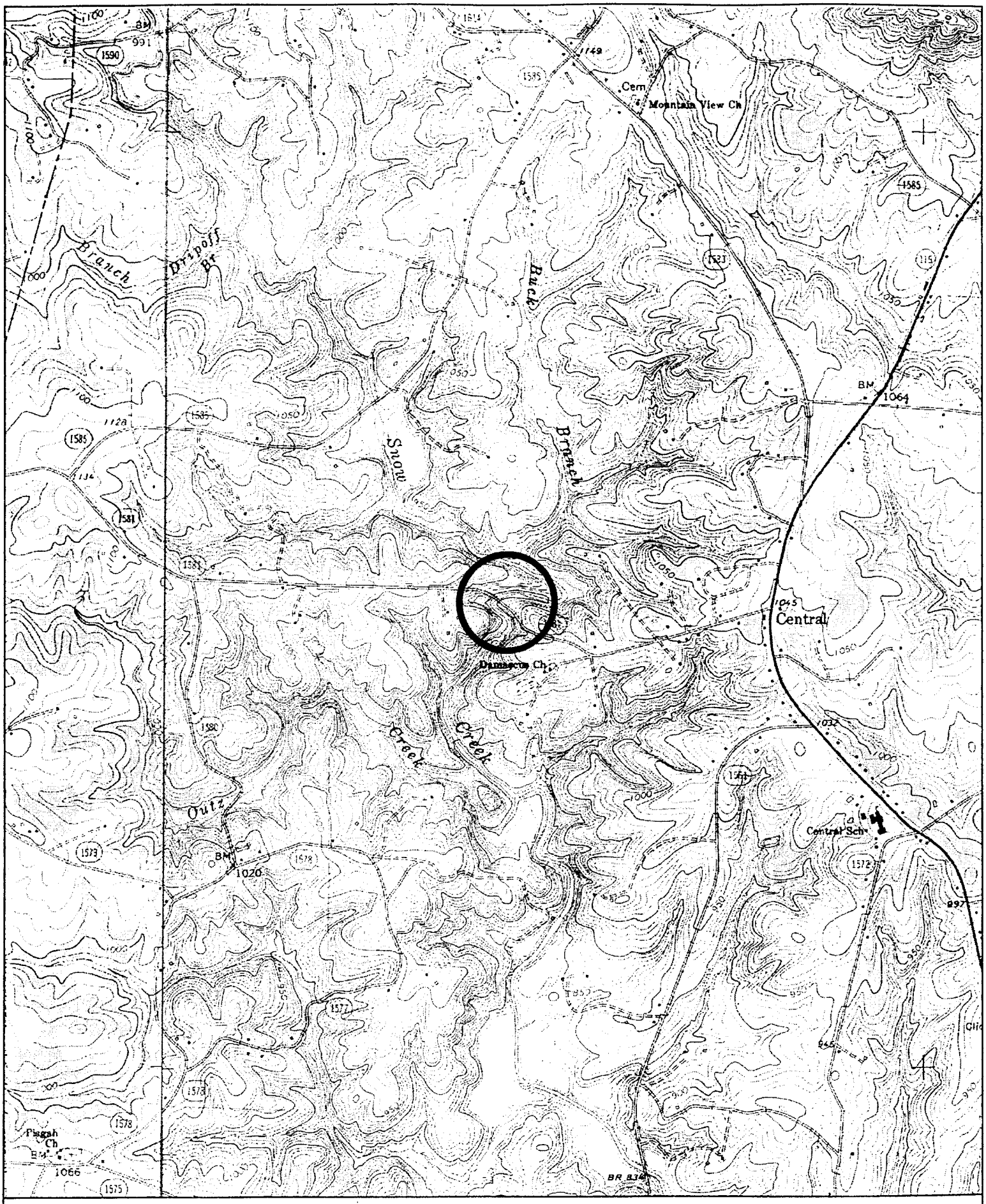




NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

IREDELL COUNTY
REPLACE BRIDGE NO. 140 ON SR 1581
OVER SNOW CREEK
B-4157

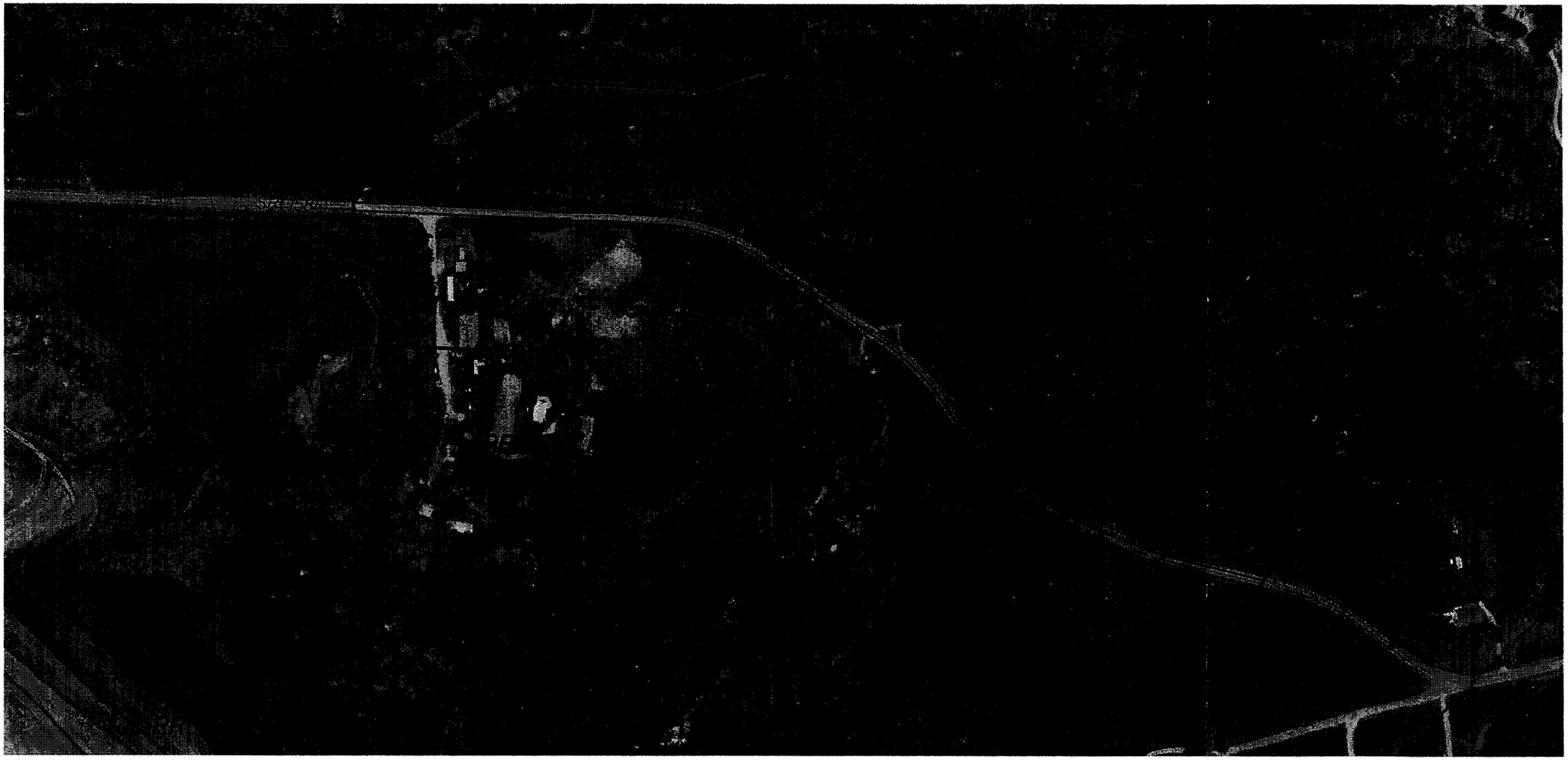
Figure 1



Name: CENTRAL
Date: 1/14/2002
Scale: 1 inch equals 2000 feet

Location: 035° 56' 15.1" N 080° 58' 55.1" W
Caption: B-4157

Figure 2



STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

LOCHNER
H.W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

REPLACEMENT OF BRIDGE NO. 140 ON SR 1581 OVER SNOW CREEK

STATE PROJECT NO. 8.2822701
T.I.P. NO. B-4157

N

100′ 0′ 200′

PLANT COMMUNITY /LAND USE /WETLAND TYPE MAP

FIGURE 3

NO WETLANDS IN STUDY AREA
---- *STREAM*
→ *DIRECTION OF STREAM FLOW*

1.4 Methodology

Data used in this investigation were obtained from a number of sources. The Central, NC (1997), U.S. Geological Survey (USGS) 7.5-minute topographic map was reviewed to determine physiographic relief and to assess landscape characteristics. U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping was also reviewed to determine what wetland types may be encountered in the field. Recent aerial photography (1:2400 scale) taken in 2001 was also used in the evaluation of the study area.

An aerial photograph of the project area serves as the base for mapping plant communities and land uses. Plant community patterns were identified from available mapping sources and then field verified. Plant community descriptions are based on a classification system utilized by the North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names typically follow nomenclature found in Radford *et al.* (1968).

Jurisdictional areas were identified using the three parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) following U.S. Army Corps of Engineers (USACE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979).

Water resource information for Snow Creek was derived from the *Yadkin River Basinwide Water Quality Management Plan* (DWQ 1998), the 2003 Draft Plan (DWQ 2003), and the N.C. Division of Water Quality (DWQ) internet resources. Quantitative sampling was not undertaken to support existing data.

The most current USFWS list (updated January 2003) of federally protected species with ranges extending into Iredell County was reviewed prior to initiation of the field investigation. In addition, NHP records (including those on the internet) documenting reported occurrences of federal and state listed species were consulted before commencing the field investigation (Amoroso 2001). Expected population distributions were determined through observations of available habitat and review of natural history and other documentation found in Martof *et al.* (1980), Webster *et al.* (1985), and Menhinick (1991).

1.5 Qualifications

Field investigations associated with this bridge replacement project (B-4157) were conducted on December 2, 2002. The H.W. Lochner Inc. environmental scientist team for

this project consisted of Ken Roeder Ph.D., Susan Smith, and Emily Fentress. Dr. Roeder is the lead Environmental Scientist and has a B.S degree in Forestry, a M.S. degree in Forest Genetics, and a Ph.D. in Forestry and Soils. He is a N.C. Licensed Soil Scientist and Registered Forester, a Certified Senior Ecologist, and has more than twenty years professional experience. Susan Smith is a Project Biologist with a B.S. degree in Forestry, a M.S. degree in Wildlife Management, and more than ten years of professional experience. Emily Fentress is a Staff Biologist with a B.S. degree in Biology and one year of professional experience.

2.0 PHYSICAL RESOURCES

The project study area is located in the Upper Piedmont Physiographic Province of North Carolina near the transition to the Blue Ridge Mountain Province. The topography in the project study area is generally characterized as strongly sloping to gently sloping on the hill tops. Elevations in the project study area range from less than 890 to greater than 1,010 feet (270 to 300 meters) above mean sea level (USGS 1997). The project study area consists of existing maintained right-of-way, upland forest, rural residential, and agricultural areas. The project vicinity is rural-residential and agricultural. Surrounding land uses include agricultural, rural residential, and forest lands.

There are potential cultural resources located within and immediately adjacent to the study area. One resident nearest to the bridge, south of SR 1581, advised that at one time part of the footprint of their house served as a community store. Just southeast of this house is a 15 to 20 feet (4 to 6 meters) waterfall on Snow Creek with the remains of an old mill operation with stonework waterwheel and machinery still present. A cultural resources investigation may be required for the project area.

2.1 Soil

The project study area is located within the Cecil-Madison soil association (NRCS 2002). Soil associations contain one or more mapping units occupying a unique natural landscape. Mapping units are named for the major soil series within the unit, but may contain minor inclusions of other soil series. There are seven non-hydric soil mapping units mapped as present within the project study area. Non-hydric soil mapping units within the project study area include: Madison gravelly fine sandy loam, 15 to 25 percent slopes, eroded; Madison gravelly fine sandy loam, 6 to 10 percent slopes; Madison gravelly fine sandy loam, 10 to 15 percent slopes, eroded, (*Typic Kanhapludults*); Wilkes soil, 10 to 15 percent slopes; Wilkes soil, 15 to 25 percent slopes; Wilkes soil, 25 to 55 percent slopes (*Typic Hapludalfs*); and Cecil fine sandy loam, 6 to 10 percent slopes, eroded (*Typic Kanhapludults*). There are no hydric soil mapping units within the project study area (SCS 1991).

2.2 Water Resources

Stream Characteristics

Snow Creek is a blue-line perennial piedmont creek approximately 32 feet (10 meters) wide and 1 to 3 feet (0.3 to 0.9 meter) deep. At the study area, Snow Creek meanders but generally flows to the south. Signs of channel excavation occur at this bridge location. Sediment deposits have accumulated at the upstream side of the bridge opening, especially between the eastern end-bent and the first set of timber piers. Signs of high water flows over this sediment deposition are present. The creek bed appears typical of middle to upper Piedmont creeks consisting of medium to sandy sediments except where thin soils expose bedrock. South of the bridge, Snow Creek meanders over exposed bedrock and cascades over a 15 to 20+ feet (4.6 to 6.0+ meters) waterfall.

The project study area is located within sub-basin 03-07-06 of the Yadkin River Basin (DWQ 1998; DWQ 2003) and is part of the USGS hydrologic unit for the South Yadkin (HUC No. 03040102) (USGS 1997). Snow Creek is a tributary of the South Yadkin River which flows into the Yadkin River. Snow Creek is identified by Stream Index Number (SIN) 12-108-9-(0.6) by the North Carolina Department of Environment and Natural Resources (DENR) (DENR 2002a). The Yadkin River Basin is not currently subject to vegetated riparian buffer requirements by the state.

A Best Usage Classification is assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. At this location, Snow Creek has been assigned a Best Usage Classification of **"WS-IV"** (Water Supply-IV) (DEM 1992, DENR 2002a). In the **WS-IV** designation, **WS** indicates the waters are used as a water supply source for drinking, culinary, or food processing purposes. **WS-I** waters are those within natural and undeveloped watersheds in public ownership with no permitted "point source" (wastewater) discharges. **WS-I** waters are **HQW** (High Quality Waters) by definition. **WS-II** waters are used as sources of potable water where a **WS-I** classification is not feasible. **WS-II** waters are generally located in predominantly undeveloped watersheds and only general permits for discharges are allowed. These are also **HQW** by definition. **WS-III** waters are used as sources of potable water where a more protective **WS-I** or **WS-II** classification is not feasible. **WS-III** waters are generally in low to moderately developed watersheds. General discharge permits are only allowed near the water supply intake; whereas domestic and non-process industrial discharges are allowed in the rest of the water supply watershed. **WS-IV** waters are used as sources of potable water where a **WS-I**, **II**, or **III** classification is not feasible. **WS-IV** waters are generally in moderately to highly developed watersheds or protected areas, and involve no categorical restrictions on discharges. **WS-V** waters are protected as supply waters which are generally upstream and draining to class **WS-IV** waters, waters used by

industry to supply their employees with drinking water, or as waters formerly used as water supply waters. Note that all **WS** waters are also protected for class **C** uses.

The **C** designation indicates freshwaters designated for secondary recreation, fishing, aquatic life including propagation and survival, wildlife, and agriculture (15A NCAC 02B .0101(c)(1)). Secondary recreation is any activity involving human body contact with water on an infrequent or incidental basis.

Snow Creek is not designated as a North Carolina Natural and Scenic River, or as a National Wild and Scenic River.

Water Quality Information

One method used by DWQ to monitor water quality is through long-term monitoring of macroinvertebrates (DEHNR 1989). There are no long-term macroinvertebrate monitoring stations located on Snow Creek or within 5.0 miles (8.0 kilometers) upstream or downstream of the project study area (DENR 2003). Another measure of water quality being 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 NCIBI monitoring stations located on Snow Creek or within 5.0 miles (8.0 kilometers) upstream or downstream of the project study area (DENR 2002).

Section 303(d) Waters

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting water quality standards or which have impaired uses. A review of the 303(d) list for North Carolina indicates that Snow Creek in the Yadkin River Basin is not listed as an impaired waterway (DWQ 2002).

Permitted Dischargers

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) and industrial wastewater treatment plants, and small domestic wastewater treatment systems serving schools, commercial offices, residential subdivisions, and individual homes (DWQ 2003). Storm water "point source" discharges include storm water collection systems for municipalities and storm water discharges associated with certain industrial activities. "Point source" dischargers in North Carolina must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit. Discharge permits are issued under the NPDES program and delegated to DWQ by the Environmental Protection Agency (EPA). No permitted "point source" dischargers are located on Snow Creek (DENR 2002b).

Sources of "non-point source" pollution within the project study area include storm water runoff from existing roads and other impervious surfaces.

Essential Fish Habitat

In 1996 the Magnuson-Stevens Fishery Conservation and Management Act mandated the identification of Essential Fish Habitat (EFH) for managed species as well as measures to conserve and enhance the habitat necessary for fish to carry out their life cycles. Under this Act EFH is defined as:

> *"those waters and substrate necessary to fish for spawning, breeding, or growth to maturity"* (16 USC 1802(10)).

In North Carolina, EFH includes offshore areas as well as inland water habitats used by anadromous fish species. Snow Creek has not been identified as used by anadromous fish or classified as trout waters.

Impacts to Water Resources

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 (BMPs) for Bridge Demolition and Removal, as well as guidelines for calculating maximum potential fill in the stream resulting from demolition. Bridge No. 140 is composed of concrete, timber, and steel. The bridge is 146 feet (45 meters) long with a clear deck width of 25 feet (7.6 meters). The superstructure will be removed without dropping it into "Waters of the United States." Since the substructure consists of timber, this will also be removed without dropping any portion into "Waters of the United States." The replacement of Bridge No. 140 can be classified as a Case 3 by the BMPs for Bridge Demolition and Removal (NCDOT 1999). Case 3 bridge replacements have no special restrictions beyond those outlined in BMPs for Protection of Surface Water and in the Bridge Demolition supplements. All work potentially affecting the resource will be carefully coordinated with the agency having jurisdiction.

Short-term impacts to water quality, such as sedimentation and turbidity, may result from construction-related activities. Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and the use of BMPs. The contractor will 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 pursuant to NCDOT's *Standard Specifications for Roads and Structures.* These measures include the use of dikes, berms, silt basins, and other containment measures to control runoff and the elimination of construction staging areas in floodplains and adjacent waterways. Disturbed sites will be revegetated with herbaceous cover after any temporary construction impacts.

It is recommended that there be no temporary fill associated with demolition and removal of the superstructure and substructure. In-stream demolition and construction activities should be scheduled to avoid and minimize impacts to aquatic resources and organisms.

Other impacts to water quality could include changes in water temperature and storm water flow. Changes in water temperature result from increased exposure to sunlight due to the removal of stream-side vegetation or increased shade due to the construction of the bridge. Changes in storm water flows could occur due to changes in the amount of impervious surface adjacent to the stream channels if roadway or bridge surface area increases.

3.0 BIOTIC RESOURCES

3.1 Terrestrial Community

Existing Vegetation Patterns

Distribution and composition of plant communities throughout the project study area reflect landscape-level variations in topography, soils, hydrology, and past and present land use practices. Agriculture, logging, selective cutting, reforestation, and other forestry practices have resulted in the present vegetative patterns. One natural plant community occurs within the project study area and two additional communities/land uses resulting from human activities have been identified. These communities total approximately 35.9 acres (14.5 hectares) and do not include any open water areas attributed to Snow Creek [0.8 acre (0.3 hectare)] or impervious road surface [1.2 acres (0.5 hectare)]. Open water areas of Snow Creek [0.8 acre (0.3 hectare)] are associated with the channel at the existing bridge right-of-way. The plant communities and land uses within the project study area were mapped on an aerial photograph base and field verified (Figure 3). A summary of the coverage of each plant community and land use within the project study area is presented in Table 1.

Table 1. Plant Communities and Land Uses occurring within the Project Study Area for Bridge No. 140 (TIP B-4157).

Plant Community/Land Use	Study Area (acres)/(hectares)	Percent of Project Study Area
Mesic Mixed Hardwood Forest (Piedmont Subtype)	17.2/7.0	47%
Agricultural Lands	17.0/6.9	48%
Rural Residential/ Maintained/Disturbed Land	1.7/0.7	5%
Totals:	35.9/14.6	100%

Mesic Mixed Hardwood Forest (Piedmont Subtype)

The Mesic Mixed Hardwood Forest (Piedmont Subtype) (Schafale and Weakley 1990) occupies approximately 17.2 acres (7.0 hectares) [47 percent] of the project study area. This forest type is found throughout the Piedmont and ranges into some of the lower elevation areas of the Blue Ridge. Under natural conditions these forests are uneven-aged with old trees present. Reproduction occurs primarily in canopy gaps. Rare severe natural disturbances allow for pulses of increased regeneration, which allows less shade-tolerant species to become established and remain in the community. Disturbed areas have increased amounts of pine and "weedy" hardwood species including yellow poplar (*Liriodendron tulipifera*) and sweetgum (*Liquidambar styraciflua*). This type grades into Piedmont/Low Mountain Alluvial Forest found in river and stream floodplains in which separate fluvial landforms and associated vegetation zones are too small to distinguish in the Piedmont and lower elevation Blue Ridge Mountain valleys (Schafale and Weakley 1990). The canopy of this type is typically dominated by mesophytic species such as beech (*Fagus grandifolia*), red oak (*Quercus rubra*), yellow poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), sugar maple (*A. saccharum*), and, in the western Piedmont, Canada hemlock (*Tsuga canadensis*). Typical understory species include flowering dogwood (*Cornus florida*), hop-hornbeam (*Ostrya virginiana*), red maple (*Acer rubrum*), and American holly (*Ilex opaca*). Shrub species may include deerberry (*Vaccinium stamineum*), downy arrowwood (*Viburnum rafinesquianum*), and American strawberry bush (*Euonymus americanus*).

Along Snow Creek, northeast of the bridge, there is a strip of land along the incised creek channel where yellow birch (*Betula alleghaniensis*) and shortleaf pine (*Pinus echinata*) have been planted. The growth and performance of the planted yellow birch indicates that site conditions are poor for this species, probably due to shallow soils. Eastern white pine (*P. strobus*) has also been planted throughout the project vicinity and in the study area.

Agricultural Lands

Agricultural Lands occupy approximately 17.0 acres (6.9 hectares) [48 percent] of the project study area. This plant community type is man-created and not identified as a natural community type by Schafale and Weakley (1990). Identified agricultural lands in the project study area consist of fields which were used for pasture. Cattle were observed.

Rural Residential/Maintained/Disturbed Lands

Rural Residential/Maintained/Disturbed Lands cover approximately 1.7 acres (0.7 hectares) [5 percent] of the study area. This plant community type is man-created and not identified as a natural community type by Schafale and Weakley (1990). Rural Residential/Maintained/Disturbed areas include roadways, road sides, maintained residential yards, sewer line corridors, and areas where other human related activities dominate the

landscape. Road sides and sewerlines are typically maintained by mowing and/or herbicides. Species observed within the road right-of-way include blackberry (*Rubus* spp.), trumpet creeper (*Campsis radicans*), lespedeza (*Lespedeza cuneata*), white clover (*Trifolium repens*), and other various road side grasses. Residential areas are dominated by numerous native and ornamental plants and various grasses. Vegetation within the rural residential component of this type is diverse and has not been specifically identified.

Terrestrial Wildlife

The project study area was visually surveyed for signs of terrestrial wildlife. The only evidence of mammals in the area was the presence of white-tail deer (*Odocoileus virginianus)* tracks and a road-killed eastern cottontail (*Sylvilagus floridanus*). Other mammals expected to occur in and around the project study area include silver-haired bat (*Lasionycteris noctivigans*), Virginia opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), and raccoon (*Procyon lotor*), as well as rodents such as beaver (*Castor canadensis*), gray squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), and golden mouse (*Ochrotomys nuttalli*). Insectivores such as eastern mole (*Scalopus aquaticus*), southeastern shrew (*Sorex longirostris*), and southern short-tailed shrew (*Blarina carolinensis*) may also be present in the project study area. No terrestrial reptiles were seen, but the following species are expected to occur in the project area: five-lined skink (*Eumeces fasciatus*); broadhead skink (*Eumeces laticeps*); fence lizard (*Sceloporus undulatus*); eastern box turtle (*Terrapene carolina*); copperhead (*Agkistrodon contortrix*); black racer (*Coluber constrictor*); and rat snake (*Elaphe obsoleta*). No terrestrial or arboreal amphibians were observed within the project area, but species expected to occur in the area include pickerel frog (*Rana palustris*), Fowler's toad (*Bufo woodhouseii*), and spring peeper (*Pseudacris crucifer*).

The following avian species were either seen or heard during the field assessment: American Crow (*Corvus brachyrhynchos*); Turkey Vulture (*Cathartes aura*); Eastern Bluebird (*Sialia sialis*); Northern Cardinal (*Cardinalis cardinalis*); Blue Jay (*Cyanocitta cristata*); Northern Mockingbird (*Mimus polyglottos*); Carolina Wren (*Thryothorus ludovicianus*); Blue-grey Gnatcatcher (*Polioptila caerulea*); Red-tailed Hawk (*Buteo jamaicensis*); and Hairy Woodpecker (*Picoides villosus*). Other avian species expected to inhabit the study area include American Robin (*Turdus migratorius*), Mourning Dove (*Zenaida macroura*), Carolina Chickadee (*Poecile carolinensis*), Pileated Woodpecker (*Dryocopus pileatus*), Downy Woodpecker (*Picoides pubescens*), and Barred Owl (*Strix varia*).

Most of the terrestrial wildlife species occurring in the project study area are typically adapted to life in fragmented landscapes. Vegetated water courses (or drainageways) provide important wildlife corridors by connecting and allowing travel between habitat fragments. Keeping the bridge replacement within the existing road corridor of the stream crossing would minimize potential impacts to wildlife. A wider and higher opening under the new bridge structure would also enhance wildlife movement at this stream crossing.

3.2 Aquatic Community

Snow Creek provides the only aquatic habitat located within the project study area associated with B-4157. No distinct areas containing significant amounts of aquatic vegetation were observed in the channel during the field assessment. A visual survey of the stream banks and channel associated with Snow Creek within the project study area was conducted to document the aquatic community.

Aquatic Wildlife

Fish were not sampled in Snow Creek as part of this study. Species expected to occur in Snow Creek include golden shiner (*Notemigonus crysoleucas*), rosyside dace (*Clinostomus funduloides*), highback chub (*Hybopsis hypsinotus*), bluehead chub (*Nocomis leptocephalus*), fieryblack shiner (*Notropis pyrrhomelas*), redlip shiner (*Notropis chiliticus*), and creek chub (*Semotilus atromaculatus*). Anadromous fish species have not been documented by Menhinick (1991) as occurring in the project study area. The North Carolina Division of Marine Resources also advises (Personal Communication, Shawn McKenna, NC Division of Marine Resources) that they believe anadromous fish species do not range this far upstream in the Yadkin River Basin.

Snow Creek most likely provides riparian and benthic habitat for a variety of amphibians and aquatic reptiles. High water following precipitation events dominated the study site during field assessments in December 2002. No sampling for amphibians was undertaken. No amphibians or aquatic reptiles were found in the course of the survey for other biotic factors. Aquatic herpetofauna expected to occur in the project study area include northern dusky salamander (*Desmognathus fuscus*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), and common snapping turtle (*Chelydra serpentina*).

Although none were observed, waterfowl expected to utilize this portion of Snow Creek include Wood Duck (*Aix sponsa*), Mallard (*Anas platyrhynchos*), Blue-winged Teal (*Anas discors*), and Canada Goose (*Branta canadensis*).

No in-stream benthic macroinvertebrate surveys were conducted. All stream banks in the study area were visually surveyed to locate freshwater mussel middens or other indicators of benthic macroinvertebrates. Visual observation of Snow Creek and its stream banks revealed no evidence of benthic macroinvertebrates. This may be due to the time of year that the work was completed and the amount of leaf litter present.

3.3 Summary of Anticipated Impacts

Actual impacts associated with the replacement of Bridge No. 140 will vary based on the alternatives that are developed. The following sections discuss the potential for impacts to terrestrial and aquatic communities at various locations.

Terrestrial Communities

An in-place replacement of the existing structure will reduce permanent impacts to plant communities and limit further community fragmentation. Impacts resulting from in-place bridge replacements are generally limited to narrow strips at or adjacent to the existing bridge structure and roadway segments. Potential impacts to plant communities within the project study area would therefore be limited to areas at the bridge and immediately adjacent to the road.

The least amount of impacts to terrestrial communities will occur if Bridge No. 140 is replaced along the center line of the existing bridge. If the alignment is shifted downstream to the south, there will be less impacts to the Mesic Mixed Hardwood Forest (Piedmont Subtype) community. This southern alignment could also impact two meander bends of Snow Creek; move SR 1581 closer to an occupied residence, the waterfall/pool and old mill site; and require more fill along the south side of SR 1581. Shifting the bridge upstream to the north would impact the Mesic Mixed Hardwood Forest (Piedmont Subtype) community. No wetlands will be affected with either shift in the alignment since no wetlands occur near this bridge site.

Wildlife expected to utilize the project study area are generally acclimated to fragmented landscapes in this agricultural area. Animals are crossing the road through the study area. Designing the new bridge on the existing alignment would limit impacts to wildlife to current levels. Shifting the bridge location slightly north or south would not extensively further fragment the habitat. If the current size opening under the bridge is maintained, access for wildlife movement will be maintained at current levels. Any design options which increase the under-bridge opening over the current size should be considered to enhance wildlife movement. Reduction of opening size will reduce access for movement by some species. There is sediment deposition under the existing bridge between the eastern end-bent and the first set of timber piers, potentially limiting flood flow under the bridge, but probably not significantly affecting animal movements through this corridor.

Aquatic Communities

Potential impacts to downstream aquatic habitat would be avoided by bridging Snow Creek to maintain normal flow and stream integrity. Support structures should be designed to avoid open water habitats whenever possible. In addition, temporary impacts to downstream habitat from increased sedimentation during demolition and construction are expected to be reduced by limiting in-stream work to an absolute minimum. Removal of the portion of the sub-structure in the creek bottom should be avoided if possible. If a small cofferdam is used to redirect stream flow away from where demolition and construction of the bridge abutments and piers is occurring, the stream bottom should be restored immediately following completion of construction activities.

Waterborne sediment flowing downstream can be minimized by use of a floating silt curtain. Stockpiled material should be kept a minimum of 50 feet (15 meters) from this stream channel. Silt fences should also be erected around any stockpiled material in order to minimize the chance of erosion or run-off from affecting the stream channel. Bridge Demolition and Removal (BDR) will follow current NCDOT Guidelines. Best Management Practices (BMPs) for the protection of surface waters should be strictly enforced to reduce impacts during all construction phases.

Aquatic wildlife may be temporarily displaced during construction of this bridge replacement project. Anadromous fish species are not reported to occur this far upstream in the Yadkin River Basin and will not be affected.

4.0 JURISDICTIONAL TOPICS

4.1 Waters of the United States

Wetlands

Water bodies such as rivers, lakes, and streams are subject to jurisdictional consideration under the Section 404 program of the CWA. Additionally, wetlands are also classified as "Waters of the United States" and are subject to jurisdictional consideration. Wetlands have been defined by EPA and USACE as:

> *"Those areas that are inundated or saturated by groundwater at a frequency and duration sufficient to support, and 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)].

Wetlands subject to review under Section 404 of the CWA (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soil; hydrophytic vegetation; and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987).

The NWI mapping (USFWS 1997) for this segment of Snow Creek does not identify wetlands adjacent to the creek throughout the study area. The field assessment verified the NWI mapping in the project study area showing no wetlands (Cowardin *et al.* 1979) (Figure 3). On this project site, "Waters of the United States" consists entirely of the Snow Creek channel.

The H.W. Lochner team assessed the project study area for jurisdictional wetland boundaries based on current USACE methodology (DOA 1987). No wetlands were found

within the study area, and no wetland/nonwetland boundaries were subsequently located with Trimble™ Global Positioning System (GPS) units. A map of the creek channel, a list of GPS point coordinates for the creek channel, and the Wetland Field Data Forms showing non-wetland areas are provided in the Appendix.

Jurisdictional Streams

Snow Creek is classified as a palustrine system (Cowardin *et al.* 1979). Palustrine systems are identified as those non-tidal wetlands that are dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and all such tidal wetlands where the ocean-derived salinities are below 0.5 parts per thousand (ppt). This category of non-tidal wetlands also includes wetlands that: a) lack such vegetation; b) occupy less than 20 acres (8 ha) in area; and c) lack a wave formed or bedrock boundary. These wetlands can also occupy a basin where the deepest part is less than 6 feet (2 meters) at low water, and where the ocean-derived salinities are below 0.5 parts per thousand (ppt).

Cowardin Classification

Snow Creek is a blue-line perennial stream with slow to medium flow over substrate consisting of fines, sand, gravel, and exposed bedrock. The channel ranges from approximately 6 to 40 feet (2 to 12 meters) in width within the project study area. Perennial systems in the middle and upper Piedmont generally have restricted movement due to landscape, steep slopes, and incised channels. If present, floodplains are poorly developed. Flow can be flashy due to localized precipitation events. Snow Creek may be classified a palustrine, forested, broad-leaved deciduous, seasonally flooded/well drained (PFO1D) system north and immediately south of the bridge (Cowardin *et al.* 1979). Further south in the study area, Snow Creek flows over exposed bedrock and is classified here as a palustrine, rock bottom, bedrock, and rubble (PRB1/2) system. Snow Creek flows over an exposed bedrock cliff face just outside of the study area creating a waterfall/pool landscape. There are also the remains of an old mill site, including stone work, steel waterwheel, and other artifacts south of the waterfall.

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 (Rosgen 1996). 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.

At the time of assessment in December 2002 the creek was at a stage higher than bankfull. It was not possible to take bankfull measurements in the field. As a result, some of the classification criteria were estimated in order to determine the Rosgen Stream Type. Rosgen methodology allows estimates of stream type to be made from calculations from USGS mapping and field observations and measurements when they are possible to obtain. Estimates of stream type were therefore made from measurements taken on USGS mapping of the bridge crossing site.

Preliminary observations within the project study area indicate that at the Snow Creek bridge crossing site, a "F" type stream segment is found in the project area (Rosgen 1996). "F" type stream segments are gently sloped, relatively wide and shallow, and have an entrenched channel with moderate to high sinuosity. "F" type stream segments are also characterized by a lack of a developed floodplain, a meandering channel, and terraces consisting of abandoned floodplains. South of the bridge the stream type reflects the confinement of the channel by bedrock, while north of the bridge the stream type reflects the deeply entrenched channel in alluvium.

Anticipated Impacts to Waters of the United States

The study area contained no jurisdictional wetlands as defined by the (USACE) delineation guidelines (DOA 1987). The limits of "Waters of the United States" consisting of Snow Creek were identified and located with Trimble™ Global Positioning System (GPS) units. Snow Creek, mapped by these GPS points, is shown on Exhibit A.

Temporary impacts include those impacts that will result from temporary demolition and construction activities associated with staging areas and/or temporary detours. These temporary impact areas will be restored to their original condition after the project has been completed. Permanent impacts are those areas that will be in the final construction limits and/or the final right-of-way of the new structure and approaches.

No temporary crossing of Snow Creek during demolition and construction appears necessary. During the demolition and construction period, a detour of traffic along Mountain View Road (SR 1583) and Cattlemans Road (SR 1585) is recommended. An assessment of these routes may be necessary, however, to ensure that this detour can handle the additional traffic volumes.

Since expected impacts to "Waters of the United States" will occur near the bridge and approaches, potential impacts will be dependent on the final bridge design, the established demolition and construction limits, the effectiveness of the erosion and sediment control plan, and the skill and compliance of the contractor.

4.2 Permits and Consultations

The design and construction of the proposed project will determine if any impacts to surface waters will occur. If impacts occur, permits and certifications will be required from various regulatory agencies in charge of protecting the water quality of public water resources. Surface water systems and wetlands receive similar protection and consideration from the regulatory agencies. These permits are authorized under the CWA and are under separate state laws regarding significant water resources.

Section 404 Permits

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." Potential impacts to "Waters of the United States" may be avoided if the waters are bridged, no disturbance to the waters occur during construction activities, and bridge demolition does not result in material falling into the waters.

It is anticipated that this proposed project will qualify as a (CE) under National Environmental Policy Act (NEPA) and Federal Highway Administration (FHWA) guidelines. Categorical Exclusions can be prepared for projects with no significant impact to the human and natural environment. If permits are required under the CWA, it is expected that the project will qualify for a Nationwide or General Permit.

Nationwide Permit (NWP) No. 23 [33 CFR 330.5(a)(23)] is generally issued by the USACE for projects having minor impacts. In the event that NWP No. 23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under a Regional General Bridge Permit designated for NCDOT bridges (Permit No. 031) issued by the Wilmington USACE District (USACOE-WD 1998). Notification to the Wilmington USACE office is required if this general permit is to be utilized. Nationwide Permit No. 33 may be required if temporary construction including cofferdams, access, and dewatering are required for this project. The USACE will determine final permit requirements.

Water Quality Certification

This project will require a 401 Water Quality General Certification from the DWQ prior to the issuance of any Section 404 Nationwide Permit. Section 401 of the CWA requires that the state issue or deny water quality certifications for any federally permitted or licensed activity that may result in a discharge into "Waters of the United States." Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land manipulation. Issuance of a 401 Certification from the DWQ is a prerequisite to the issuance of a Section 404 Permit.

Potential impacts to areas of Snow Creek will be limited to the actual right-of-way width and will be determined by NCDOT during the design phase of this project. Impacts to Snow Creek are not expected due to the use of channel-spanning structures. During bridge removal procedures, NCDOT's BMPs will be utilized, including erosion control measures. Floating turbidity curtains are also recommended to minimize the amount of turbid water flowing off-site.

Riparian Buffers

Currently, North Carolina has rules in place for the protection and maintenance of vegetated riparian buffers in the Neuse, Tar-Pamlico, and part of the Catawba River Basins. These rules require wooded buffers of 50 feet (15.3 meters) along all blue-line stream channels. In order to impact these buffers there must be a demonstrated "no practical alternative", and an *Authorization Certificate* pursuant to 15A NCAC 2B .0259. must be obtained for a proposed use that is designated as allowable with mitigation. It is also possible within the rules to obtain a variance (15A NCAC 2B .0259) or to pay into a state Riparian Buffer Restoration Fund. Snow Creek is a designated blue-line stream (Figure 2), however, these rules are currently not mandated for the Yadkin River Basin.

Section 9

Bridge construction or replacement over navigable waters may require United States Coast Guard Service (USCGS) authorization pursuant to 33 CFR 114-115. 33 CFR 115.70 gives:

> *"advanced approval to the location and plans of bridges to be constructed across reaches of waterways navigable in law, but not actually navigated other than by logs, log rafts, rowboats, canoes and small motorboats. In such cases the clearances provided for high water stages will be considered adequate to meet reasonable needs of navigation."*

The open water area of Bridge No. 140 over Snow Creek is small in size and would be given advanced approval by the USCGS.

4.3 Mitigation

Mitigation has been defined in 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 wetland impacts is recommended in accordance with Section 404(b)(1) Guidelines of the CWA (40 CFR 230), 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.

Federal Highway Administration 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. Mitigation employed outside of the highway right-of-way must be reviewed and approved on a case-by-case basis.

Avoidance – Surface waters, but no jurisdictional wetland areas, are present within the project study area. Potential stream impacts are discussed in Section 4.1. Actual impacts to surface waters will be addressed when alternatives are developed. It may not be possible to avoid all impacts to jurisdictional areas. Impacts can be avoided to streams with the use of environmentally sensitive design. Impacts to the jurisdictional surface waters can be avoided by bridging the stream channel, avoiding construction activities in the stream channels, and avoiding deposition into the stream channel during bridge demolition and construction.

Minimization – Impacts to the stream can be minimized by designing support structures to avoid wetlands or open water habitats whenever possible. The jurisdictional delineation within the project study area will be utilized to further minimize stream impacts when designing the proposed alignment within the project study area. Minimization of jurisdictional impacts can be achieved by replacement of a bridge in-place and utilizing as much of the existing bridge corridor as possible. This should result in a minimal amount of new impact depending on the final design of the new bridge. Utilization of BMPs is recommended in an effort to minimize impacts.

Compensatory mitigation – Impacts to jurisdictional waters are not known at this time. Impacts associated with the project could be mitigated by replanting disturbed areas with native species and removal of any temporary fill material within the floodplain upon project completion. If impacts are greater than 0.1 acre (0.04 hectare) compensatory mitigation may be required, and if impacts are greater than 0.5 acre (0.2 hectare) compensatory mitigation is mandatory.

North Carolina Riparian Buffers – Although not currently required in the Yadkin River Basin, unavoidable impacts to stream buffers could still be mitigated. Mitigation may consist of payment of a compensatory mitigation fee into the state Riparian Buffer Restoration Fund, donation of real property, or restoration or enhancement of a non-forested riparian buffer.

Potential mitigation opportunities – No on-site wetlands mitigation or stream restoration opportunities were identified in the study area. In the project study area, Snow Creek does not have an adequate wooded riparian buffer immediately southeast of the existing bridge. This area is part of the rural residential property along the road right-of-way.

4.4 Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), or Officially Proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). One federally protected species is listed for Iredell County (USFWS list dated January 2003) (Table 2). The bog turtle has been reported as an historic occurrence by the North Carolina Natural Heritage Program (Appendix) in the area of the Central, NC (1997), 7.5-minute USGS Quad Sheet. An historic occurrence means that the reported occurrence is older than 20 years. No other protected species were identified which may occur in the project area.

Table 2. Federally Protected Species Listed for Iredell County, NC.

Common Name	Scientific Name	Federal Status	Biological Conclusion
Bog Turtle	*Clemmys muhlenbergii*	T(S/A)	N/A

T(S/A)- Threatened in the southern U.S. due to similarity in appearance to the northern population.
N/A Biological Conclusion not required.

Bog Turtle (*Clemmys muhlenbergii*)

The bog turtle is a small turtle reaching an adult size of approximately 3 to 4 inches (8 to 10 centimeters). This otherwise darkly-colored species is readily identifiable by the presence of a bright orange or yellow blotch on the sides of the head and neck (Martof *et al.* 1980). Bog turtle is typically found in bogs, marshes, and wet pastures, usually in association with aquatic or semi-aquatic vegetation and small, shallow streams over soft bottoms (Palmer and Braswell 1995). The bog turtle occurs from New York to northern Georgia. In North Carolina, bog turtle has a discontinuous distribution in the Mountains and western Piedmont.

The bog turtle has declined drastically within the northern portion of its range due to over-collection and habitat alteration. As a result, the USFWS listed the bog turtle as threatened within the northern and southern portion of its range. Within the southern portion of its range, which includes North Carolina, the bog turtle is listed as threatened due to similarity of appearance to the northern population (USFWS 1997). The listing allows incidental take of bog turtle in the southern population resulting from otherwise

lawful activity. T(S/A) species are not subject to Section 7 consultation and a biological conclusion is not required. No known occurrences of bog turtle have been documented within 3.0 miles (4.8 kilometers) of the project study area (NHP records review November 2002), although an historic record shows this species was reported to occur in the area encompassed by the Central, N.C. 7.5-minute Quad Sheet (USGS 1997).

No surveys for bog turtle were performed due to the date of site assessment (December 2, 2002) when bog turtle are in hibernation underground. Bog turtle come out of hibernation in the spring when they migrate to their preferred habitats. No bog, marsh, or wet pasture habitats associated with shallow soft bottom streams occur within the project study area. Snow Creek flows over bedrock in part of the study area. No sightings of bog turtle in Iredell County have been reported to the NHP in the past 20 years.

BIOLOGICAL CONCLUSION: N/A

No suitable habitat for the bog turtle exists within the project study area. No known recent occurrence of bog turtle has been reported in the immediate Snow Creek drainage. Bog turtle is listed in the southern part of its range due to its similarity of appearance to the northern population of bog turtle that is federally protected. T S/A species are not subject to Section 7 consultation and a biological conclusion for this species is not required.

Analysis Details -

Methodology: analysis of the possible presence of and impacts to bog turtle was conducted as an evaluation of existing information and analysis by the primary investigators of the habitat requirements and occurrence of bog turtle in North Carolina.

Qualifications: this analysis was conducted by Dr. Ken Roeder and Susan Smith whose credentials are listed in Section 1.5 of this report.

Federal Species of Concern

The January 2003 USFWS list also includes a category of species designated as "Federal Species of Concern" (FSC) (Appendix). 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. Federal Species of Concern listed for Iredell County include three species (Table 3). None of these FSC are reported by NHP (records review November 2002) to occur in the area covered by the Central, NC, 7.5-minute, USGS Quad Sheet (USGS 1997) where this bridge replacement project is located.

Table 3. Federal Species of Concern (FSC) Listed for Iredell County, NC.

Common Name	Scientific Name	State Status	Potential Habitat
Allegheny Woodrat	*Neotoma magister*	SC	No
Tall Larkspur	*Delphinium exaltatum*	E-SC	No
Carolina Birdfoot-trefoil	*Lotus helleri*	SR-T	No

E- Endangered, T- Threatened, SR- Significantly Rare, SC- Special Concern, _T- Rare throughout its range.

4.5 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 NHP records indicates that no state listed species have been documented within 3.0 miles (4.8 kilometers) of the project study area. This project will not affect any known occurrences of state listed species.

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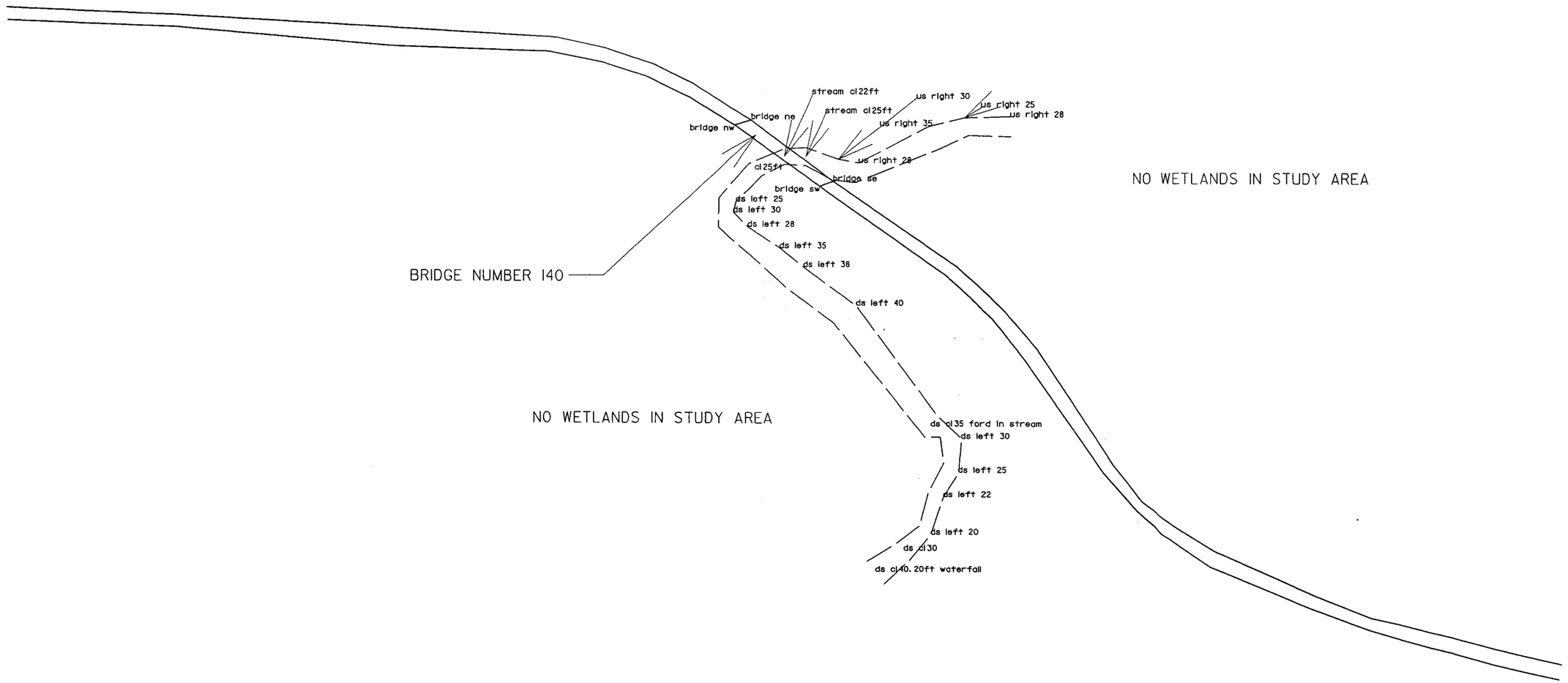
APPENDIX

Exhibit A. GPS Located "Waters of the United States" and Jurisdictional Wetlands
GPS Located Wetland Points
USACE and DWQ Wetland and Stream Data Forms
Natural Heritage Program Endangered Species List



LOCHNER
H.W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

REPLACEMENT OF BRIDGE NO. 140 ON SR 1581 OVER SNOW CREEK

STATE PROJECT NO. 8.2822701
T.I.P. NO. B-4157

0 100′ 200′

GPS LOCATED WATERS OF THE US AND WETLANDS

EXHIBIT A

GPS LOCATED WETLANDS

GPS LOCATED STREAM

B-4157 GPS Located Stream Points		
POINT NAME	**LONGITUDE (°, ', ")**	**LATITUDE (°, ', ")**
STREAM CL 22 FT	80 58 53.724491716	35 56 16.220151931
STREAM CL 25 FT	80 58 53.361497333	35 56 16.221957696
CL 25 FT	80 58 54.226226173	35 56 16.024532345
DS LEFT 25	80 58 54.541484065	35 56 15.580273986
DS LEFT 30	80 58 54.576220037	35 56 15.435362844
DS LEFT 28	80 58 54.329633918	35 56 15.235680382
DS LEFT 35	80 58 53.759067067	35 56 14.951066034
DS LEFT 38	80 58 53.356517383	35 56 14.697728347
DS LEFT 40	80 58 52.425749182	35 56 14.175819216
DS CL 35 FORD IN STREAM	80 58 51.088513802	35 56 12.514006967
DS LEFT 30	80 58 50.559452346	35 56 12.347832812
DS LEFT 25	80 58 50.593510689	35 56 11.867860956
DS LEFT 22	80 58 50.844528145	35 56 11.529306792
DS LEFT 20	80 58 51.044302423	35 56 10.994588024
DS CL 30	80 58 51.497575860	35 56 10.761676601
DS CL 40. 20 FT WATERFALL	80 58 51.973989387	35 56 10.451715801
US RIGHT 30	80 58 52.792145331	35 56 16.199406282
US RIGHT 28	80 58 52.445933633	35 56 16.153384914
US RIGHT 28	80 58 51.255724311	35 56 16.679947096
US RIGHT 25	80 58 50.645625332	35 56 16.807631223
US RIGHT 35	80 58 49.881722394	35 56 16.836648272

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4157	DATE:	02 December 2002
APPLICANT:	NCDOT	COUNTY:	Iredell
INVESTIGATOR:	K. Roeder, S. Smith	QUAD MAP:	Central, NC

Do normal circumstances exist on this site?	Yes	Community ID:	UPL
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	01

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Pinus strobus*	C	FACU				
2.							
3.							
4.							
5.							
6.				13.			
7.				14.			

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-): 0 %

Remarks:

HYDROLOGY

	Recorded Data (Describe in Remarks)		Wetlands Hydrology Indicators:
	Stream, Lake, or Tide Gauge		*Primary Indicators*
	Aerial Photographs		Inundated
	Other		Saturated in Upper 12 inches
X	No Recorded Data Available		Water Marks
			Drift Lines
Field Observations:			Sediment Deposits
Depth of Surface Water:	0 Inches		Drainage Patterns in Wetlands
Depth to Free Water in Pit:	>24 Inches		*Secondary Indicators (2 or more required)*
Depth to Saturated Soil:	>24 Inches		Oxidized Root Channels in Upper 12 in.
			Water-Stained Leaves
			Local Soil Survey Data
			Fac-Neutral Test
			Other (Explain)

Remarks: Water only in stream channel

SOILS

Map Unit Name: (Series and Phase)	Wilkes soil	Drainage Class:	Well drained
Taxonomy (Subgroup):	Typic Hapludalfs	Field Observations Confirmed Mapped Type?	Yes

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
0-2	A	10YR 4/4	None	None	Sandy loam
2-24+	B	10YR 5/6	None	None	Sandy loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks: Terrace slope above deeply cut creek channel above small floodplain

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No	Is this Sampling Point within a Wetland?	No
Wetland Hydrology Present?	No		
Hydric Soils Present?	No		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE WETLAND DELINEATION MANUAL)

PROJECT:	B-4157	DATE:	02 December 2002
APPLICANT:	NCDOT	COUNTY:	Iredell
INVESTIGATOR:	K. Roeder, S. Smith	QUAD MAP:	Central, NC

Do normal circumstances exist on this site?	Yes	Community ID:	UPL
Is the site significantly disturbed (Atypical Situation)?	No	Transect ID:	
Is this area a Potential Problem Area? (if needed, explain on reverse)	No	Plot ID:	02

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Betula alleghaniensis*	C	FACU+				
2.							
3.							
4.							
5.							
6.				13.			
7.				14.			

Percent of Dominant Species that are OBL, FACW, or FAC (Excluding FAC-): 0 %

Remarks: Birch appears planted in rows above creek channel.

HYDROLOGY

Recorded Data (Describe in Remarks)

_____ Stream, Lake, or Tide Gauge

_____ Aerial Photographs

_____ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 Inches

Depth to Free Water in Pit: >24 Inches

Depth to Saturated Soil: >24 Inches

Wetlands 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 in.

_____ Water-Stained Leaves

_____ Local Soil Survey Data

_____ Fac-Neutral Test

_____ Other (Explain)

Remarks:

SOILS

Map Unit Name: (Series and Phase)	Wilkes soil	Drainage Class:	Well drained
Taxonomy (Subgroup):	Typic Hapludalfs	Field Observations Confirmed Mapped Type?	Yes

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture/Concretions
0-3	A	10YR 4/3	None	None	Sandy loam
3+	B	7.5YR 4/6	None	None	Sandy loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soil
	Sulfidic Odor		Organic Streaking in Sandy Soil
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Expain in Remarks)

Remarks: Terrace slope above deeply cut creek channel above small floodplain

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	No	Is this Sampling Point within a Wetland?	No
Wetland Hydrology Present?	No		
Hydric Soils Present?	No		

Remarks:

NCDWQ Stream Classification Form

Project Name: Bridge Replacement | River Basin: Yadkin | County: Iredell | Evaluator: S. Smith

DWQ Project Number: B-4157 | Nearest Named Stream: Snow Creek | Latitude: 35° 56' 16" | Signature:

Date: 02 Dec. 2002 | USGS QUAD: Central | Longitude: 80° 58' 53" | Location/Directions:

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?	0	1	2	(3)
*(*NOTE: If Bed & Bank Caused By Ditching And WITHOUT Sinuosity Then Score=0*)*				
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: 20

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 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: 6

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: 2.5

II. Hydrology	Absent	Weak	Moderate	Strong
1) Is This Year's (Or Last's) Leaflitter Present In Streambed?	(1.5)	1	.5	0
2) Is Sediment On Plants (Or Debris) Present?	0	.5	1	(1.5)
3) Are Wrack Lines Present?	0	.5	1	(1.5)
4) Is Water In Channel ***And*** >48 Hrs. Since Last ***Known*** Rain? *(*NOTE: If Ditch Indicated In #9 Above Skip This Step And #5 Below*)*	0	.5	1	(1.5)
5) Is There Water In Channel During Dry Conditions ***Or*** In Growing Season)?	0	.5	1	(1.5)
6) Are Hydric Soils Present In Sides Of Channel (Or In Headcut)?	***Yes***=1.5		***No***=(0)	

SECONDARY HYDROLOGY INDICATOR POINTS: 7.5

III. Biology	Absent	Weak	Moderate	Strong
1) Are Fish Present?	(0)	.5	1	1.5
2) Are Amphibians Present?	(0)	.5	1	1.5
3) Are AquaticTurtles Present?	(0)	.5	1	1.5
4) Are Crayfish Present?	(0)	.5	1	1.5
5) Are Macrobenthos Present?	(0)	.5	1	1.5
6) Are Iron Oxidizing Bacteria/Fungus Present?	0	.5	1	(1.5)
7) Is Filamentous Algae Present?	(0)	.5	1	1.5

8) Are Wetland Plants In Streambed?	SAV	Mostly OBL	Mostly FACW	Mostly FAC	Mostly FACU	Mostly UPL
(NOTE: If Total Absence Of All Plants In Streambed As Noted Above Skip This Step UNLESS SAV Present*).*	2	1	.75	.5	0	0

SECONDARY BIOLOGY INDICATOR POINTS: 1.5

TOTAL POINTS ***(Primary + Secondary)***=40.5 ***(If Greater Than Or Equal To 19 Points The Stream Is At Least Intermittent)***

INTERMITTENT CHANNEL EVALUATION FORM

ACTION ID B-4157 APPLICANT NAME NCDOT DATE 2 Dec. 2002

PROPOSED CHANNEL WORK (i.e., culvert, relocation, etc.) Bridge Replacement

WATERBODY/RIVER BASIN Snow Creek COUNTY/CITY Iredell County

RECENT WEATHER CONDITIONS Cool

P	SP	NP	Observation	Comments or Description
		✓	Fish/Shellfish/Crustaceans Present	
		✓	Benthic Macro Invertbrates	
		✓	Amphibians Present/Breeding	
✓			Algae And/Or Fungus (water quality function)	
✓			Wildlife Channel Use (i.e. tracks, feces, shells, others)	
		✓	Federally Protected Species Present (Discontinue)	
✓			Riffle/Pool Structure	
	✓		Stable Streambanks	
✓			Channel Substrate (i.e. gravel, cobble, rock, coarse sand)	
	✓		Riparian Canopy Present (SP =/> 50% closure)	
✓			Undercut Banks/Instream Habitat Structure	
	✓		Flow In Channel	
		✓	Wetlands Adjacent To/Contig. With Channel (Discontinue)	
	✓		Persistent Pools/Saturated Bottom (June thru Sept.)	
	✓		Seeps/Groundwater Discharge (June thru Sept.)	
✓			Adjacent Floodplain Present	
	✓		Wrack Material or Drift Lines	
✓			Hydrophytic Vegetation in/adjacent to channel	

Important To Domestic Water Supply? Y / (N)

Does Channel Appear On A Quad Or Soils Map? (Y) / N **Approx. Drainage Area:** _____

Determination:

- [✓] Perennial Channel (stop)
- [ ] Intermittent Channel (proceed)
- [ ] Ephemeral Channel (no jd)
- [ ] Ditch Through Upland (no jd)

- [✓] Important Channel: _____ LF
- [ ] Unimportant Channel: _____ LF

(attach map indicating location of important/unimportant channel)

PROJECT MGR. Initials _____

Evaluator's Signature: _____
(if other than C.O.E. project manager)

P=Present SP=Stongly Present NP=Not Present

Search Criteria: Iredell, Listed
Search Results: 8 records found.

Major Group	Scientific Name	Common Name	State Status	Federal Status	State Rank	Global Rank	County Status
Mammal	Neotoma magister	Allegheny Woodrat	SC	FSC	S2	G3G4	Current - Iredell - MAP - HABITAT
Bird	Lanius ludovicianus ludovicianus	Loggerhead Shrike	SC	-	S3B,S3N	G4T4	Current - Iredell - MAP - HABITAT
Reptile	Glyptemys muhlenbergii	Bog Turtle	T	T(S/A)	S2	G3	Historic - Iredell - MAP - HABITAT
Fish	Carpiodes velifer	Highfin Carpsucker	SC	-	S2	G4G5	Current - Iredell - MAP - HABITAT
Vascular Plant	Carex conoidea	Cone-shaped Sedge	T	-	S1	G5	Obscure - Iredell - MAP - HABITAT
Vascular Plant	Delphinium exaltatum	Tall Larkspur	E-SC	FSC	S1	G3	Historic - Iredell - MAP - HABITAT
Vascular Plant	Helenium brevifolium	Littleleaf Sneezeweed	E	-	S1	G3G4	Current - Iredell - MAP - HABITAT
Vascular Plant	Lotus helleri	Carolina Birdfoot-trefoil	SR-T	FSC	S3	G5T3	Historic - Iredell - MAP - HABITAT

NC NHP database updated: January, 2003. Search performed on Thursday, February 6, 2003 at 11:00:44 Eastern Standard Time.
Total number of searches since 01/01/03: 410
Explanation of Codes
Do NOT bookmark this search results page, instead bookmark: www.ncsparks.net/nhp/county.html

Search Criteria: =Central
Quads: 3

Major Group	Scientific Name (Habitat link)	Common Name	State Status	Federal Status	State Rank	Global Rank	Quad Status
Reptile	Glyptemys muhlenbergii	Bog Turtle	T	T(S/A)	S2	G3	Potential - CENTRAL
Vascular Plant	Helenium brevifolium	Littleleaf Sneezeweed	E	-	S1	G3G4	Current - CENTRAL
Natural Community	Hillside Seepage Bog	-	-	-	S1	G1	Current - CENTRAL

NC NHP database updated: January 2003. Search performed on Thursday, February 6, 2003 at 11:09:01 Eastern Standard Time.
Total number of searches since 01/01/03: 256
Explanation of Codes
Do NOT bookmark this search results page, instead bookmark: www.ncsparks.net/nhp/quad.html