



**North Carolina Department of Natural and Cultural Resources**  
**State Historic Preservation Office**

Ramona M. Bartos, Administrator

Governor Pat McCrory  
Secretary Susan Kluttz

Office of Archives and History  
Deputy Secretary Kevin Cherry

April 19, 2016

Jason Anderson  
US Forest Service  
160 Zillicoa Street, Suite A  
Asheville, NC 28801

Re: Replace Bridge 140-1.5 at Courthouse Creek and Avery Creek Culvert on FSR 477, Pisgah Ranger District, Pisgah National Forest, Transylvania County, ER 16-0506

Dear Mr. Snedeker:

Thank you for your letter of March 11, 2016, concerning the above-referenced undertaking. We have reviewed the *Historic Documentation and National Register of Historic Places Evaluation of the Courthouse Creek Bridge and Avery Creek Culvert, Pisgah Ranger District, Pisgah National Forest, Transylvania County, North Carolina* report submitted and offer the following comments.

Although the report suggests the Courthouse Creek Bridge and Avery Creek culvert may be associated with the Civilian Conservation Corps, there is no concrete evidence to support this theory. In addition, the advanced deterioration of the bridge and culvert, the possible replacement of materials, e.g., the headwall of the culvert, suggests neither property possesses the level of integrity to be eligible for listing in the National Register of Historic Places. Thus, we concur with your determination that the aforementioned properties are not eligible for listing in the National Register and offer no further 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 consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or [environmental.review@ncdcr.gov](mailto:environmental.review@ncdcr.gov). In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

A handwritten signature in cursive script that reads "Renee Gledhill-Earley".

Handwritten initials "RM" in cursive, followed by the typed name "Ramona M. Bartos".

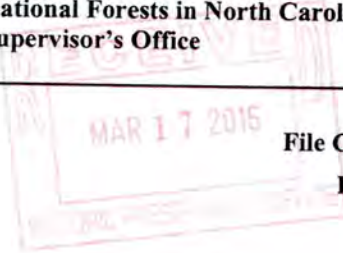


United States  
Department of  
Agriculture

Forest  
Service

National Forests in North Carolina  
Supervisor's Office

160 ZILICOA ST STE A  
ASHEVILLE NC 28801-1082  
828-257-4200



File Code: 2360-3 / 1500  
Date: March 11, 2016

Ms. Ramona M. Bartos  
Deputy SHPO  
Div. of Archives & History  
4617 Mail Services Center  
Raleigh, NC 27699-4617

52 16- 5506

Dec 4/11/16 A

Dear Ms. Bartos:

Dec 4/11/16 S SEE LETTER  
AV 4/28/16

Enclosed is the report *Historic Documentation and National Register of Historic Places Evaluation of the Courthouse Creek Bridge and Avery Creek Culvert, Pisgah Ranger District, Pisgah National Forest, Transylvania County, North Carolina* for your review and comment.

Sincerely,

*/s/ Rodney J. Snedecker*

*FOR*

JASON L. ANDERSON  
Acting Engineering, Heritage Resources  
and Recreation Staff Officer

Enclosures (2)

cc: Pisgah Ranger District  
Zone NEPA Planner  
Zone Archeologist



2015

**Historic Documentation and National Register of Historic Places Evaluation of the  
Courthouse Creek Bridge and Avery Creek Culvert, Pisgah Ranger District,  
Pisgah National Forest, Transylvania County, North Carolina**



**Scott Shumate**

With Contributions by:  
**Lorie Hansen, Scott Ashcraft,  
Rodney Snedeker, Barry Jones, &  
Sam Shumate**

Blue Ridge Archaeological Consultants



**Historic Documentation and National Register of Historic  
Places Evaluation of the Courthouse Creek Bridge and Avery  
Creek Culvert, Pisgah Ranger District, Pisgah National Forest,  
Transylvania County, North Carolina**

Final Report



Submitted to:

A. Scott Ashcraft  
Archaeologist  
Pisgah National Forest  
National Forests in North Carolina  
632 Manor Road  
Mars Hill, NC 28754

Submitted by:

Scott Shumate  
Blue Ridge Archaeological Consultants

With Contributions by:  
Lorie Hansen, Scott Ashcraft,  
Rodney Snedeker, & Sam Shumate

August 18, 2015

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## **ABSTRACT AND MANAGEMENT SUMMARY**

The 2015 investigations at Courthouse Creek Bridge 140-1.5 and the Avery Creek Road culvert conducted by BRAC included photo-documentation and measured drawings of the single-lane, single span bridge over Courthouse Creek and the stone headwall and outflow wall and steel drain pipe at Avery Creek Road. The wooden, steel, and concrete bridge at Courthouse Creek was constructed in 1939 and is most likely an example of Civilian Conservation Corps technique and craftsmanship. The year in which the culvert at Avery Creek Road was constructed is not definitely known, but a CCC-era (ca. 1933-1942) association is likely. Field inspections of the Courthouse Creek bridge by USFS engineers conducted since 1979 indicate a steadily declining structure, while recent events (i.e. a failure in the bridge decking and fracture of several of the underlying support timbers) combine with earlier faults and deficiencies recommend bridge replacement in the near term. A similar failure or breach in the corrugated steel pipe of the Avery Creek Road culvert has opened a hole in the surface of FSR 477 and recommends replacement sooner rather than later. Any number of other faults and failures in both the bridge and the culvert provide evidence of the poor condition of both structures. For example, the significantly dissimilar construction details apparent in the headwall and outflow walls of the culvert at Avery Creek Road likely indicates a more recent replacement of the headwall. Although the probable CCC association of the bridge and culvert is of historical interest, the poor condition of both structures and the occurrence of a significant number of other, more exceptional bridges and culverts of CCC-construction located throughout the National Forests in North Carolina and elsewhere across the country indicate that neither structure is historically significant. Therefore, neither the bridge at Courthouse Creek nor the culvert at Avery Creek Road is recommended as eligible for nomination to the National Register of Historic Places. No further investigation is recommended at either structure and we find no objection to the proposed replacement of both structures.



## FIELD REPORT

**PROJECT TITLE:** Historic Documentation and National Register of Historic Places Evaluation of the Courthouse Creek Bridge and Avery Creek Culvert, Pisgah Ranger District, Pisgah National Forest, Transylvania County, North Carolina

**DATES OF FIELD WORK:** July 1 and July 15, 2015

**FIELD INVESTIGATORS:** Scott Shumate, Lorie Hansen, & Sam Shumate

**USFS CONTACTS:** Scott Ashcraft & Rodney Snedeker

**PROJECT DESCRIPTION:** At the request of the National Forests in North Carolina (USFS), archaeologists Scott Shumate and Lorie Hansen of Blue Ridge Archaeological Consultants (BRAC) recently conducted an architectural documentation and evaluation of Bridge 140-1.5 on Courthouse Creek Road and a stone and metal culvert on Avery Creek Road in northern Transylvania County, North Carolina (Figures 1 and 2). The project scope-of-work drawn up by Pisgah National Forest Archaeologist Scott Ashcraft and Forest Archaeologist Rodney Snedeker called for: 1) field documentation of the bridge and culvert to include digital photographs with and without scales; 2) measured drawings of project-related structures and features; and 3) evaluation of these structures for their potential to be nominated to the National Register of Historic Places. If evaluated at ineligible for nomination to the NRHP, then USFS plans call for the replacement of both structures. The 28-foot long single-span, single lane bridge at Courthouse Creek will be replaced with a 45-foot long, single lane bridge that meets ASSHTO-LRFD Standards. Although BRAC was not given specific project plans for the culvert along Avery Creek Road, similar structures in other parts of the Pisgah National Forest are typically replaced in kind—with new corrugated steel piping and stone headwalls.

**PROJECT LOCATION:** The general project area may be described as located within the west-central (Courthouse Creek) and east-central (Avery Creek) portions of the Pisgah Ranger District, and within the southeastern portion of the larger Pisgah National Forest in western North Carolina. The more immediate Courthouse Creek bridge project area is located within the northwestern portion of Transylvania County, nearly 9.0 miles (as the crow flies) northwest of central downtown Brevard, and approximately 2.5 linear miles northwest of the community of Balsam Grove. The Jackson County line at Pinhook Gap lies only 1.8 miles west of the Courthouse Creek project area, while the Haywood County line, the Blue Ridge Parkway, and Devils Courthouse lie 2.8 miles north of Bridge 140-1.5. The culvert along Avery Creek Road (FSR 477) is located approximately 4.5 miles due north of downtown Brevard and nearly 2.6 linear miles northwest of the intersection of US 64 and US 276 at Pisgah Forest, North Carolina. The culvert lies approximately 0.87 miles along Avery Creek Road to the north of its intersection with US 276. Note that the creek that flows through this culvert and beneath Avery Creek Road is an east-trending, unnamed tributary of Avery Creek, which has its confluence with the larger drainage approximately 200 feet east of the culvert. Note also that Bridge 140-1.5 is considered by most to span Courthouse Creek, but some maps of the area label that portion of the drainage as the North Fork of the French Broad River.

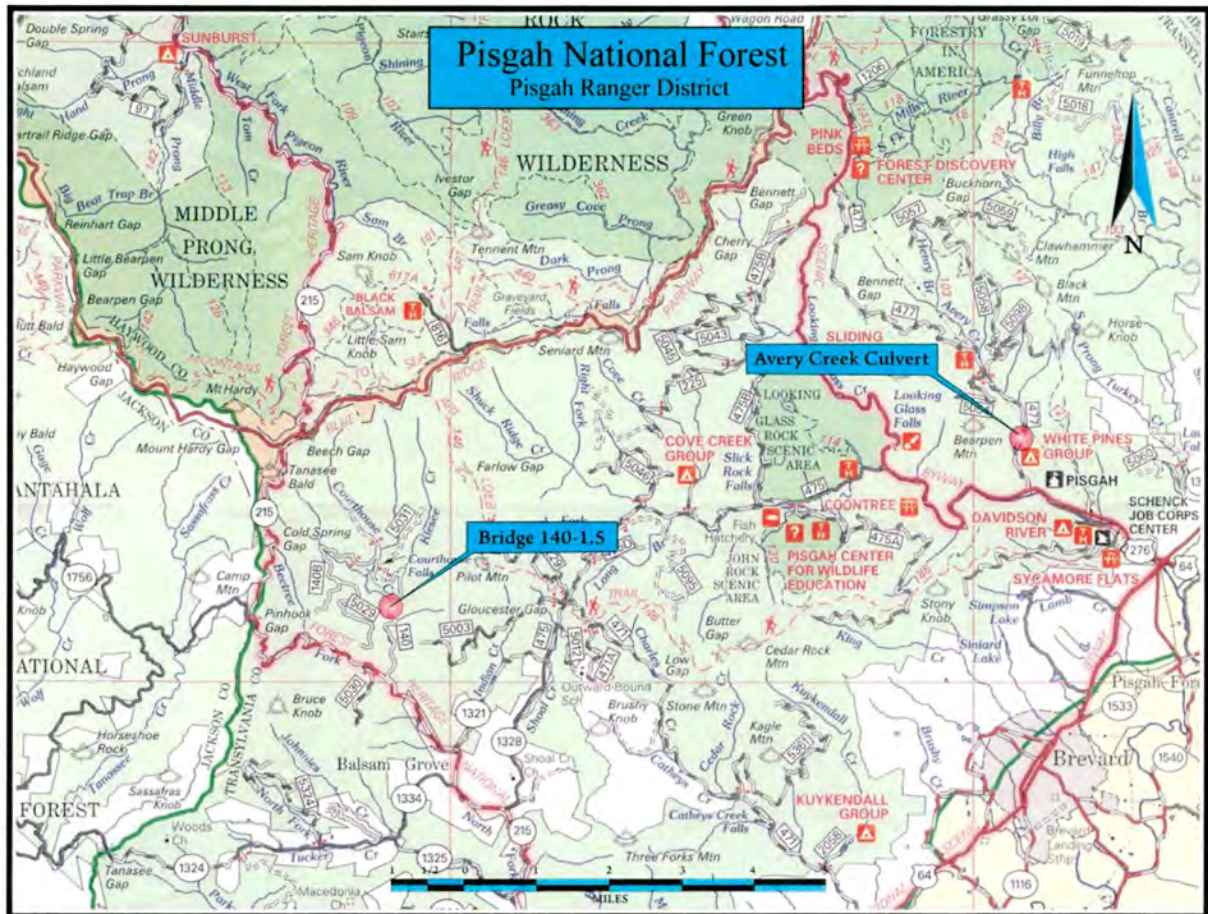


Figure 1. The location of the Courthouse Creek bridge (140-1.5) and Avery Creek Road culvert project areas on a portion of the USFS Pisgah Ranger District map.

Courthouse Creek, along with several other drainages of similar scale form the headwaters of the North Fork of the French Broad River.

**HISTORICAL CONTEXT:** The area including and surrounding the Avery Creek portion of the current project area was formerly a small portion of the once expansive George and Edith Vanderbilt Estate. George Vanderbilt had come to the mountains of western North Carolina on a temporary retreat, but his decision to make the Asheville area his home (or at least one of his homes) would ultimately have a profound and lasting effect on the city and region. Beginning in 1888, he authorized his agents to begin the process of secretly acquiring land upon which he might construct a summer estate. Beginning in 1890 Vanderbilt acquired a considerable portion of those formerly forested acres cut over by the Scottish Brothers Lumber Company and others. By 1891, Vanderbilt had already acquired nearly 6,000 acres in neighboring Buncombe County. While these 6000 acres were to form the nucleus of his estate, he eventually acquired at least 120,000 acres of

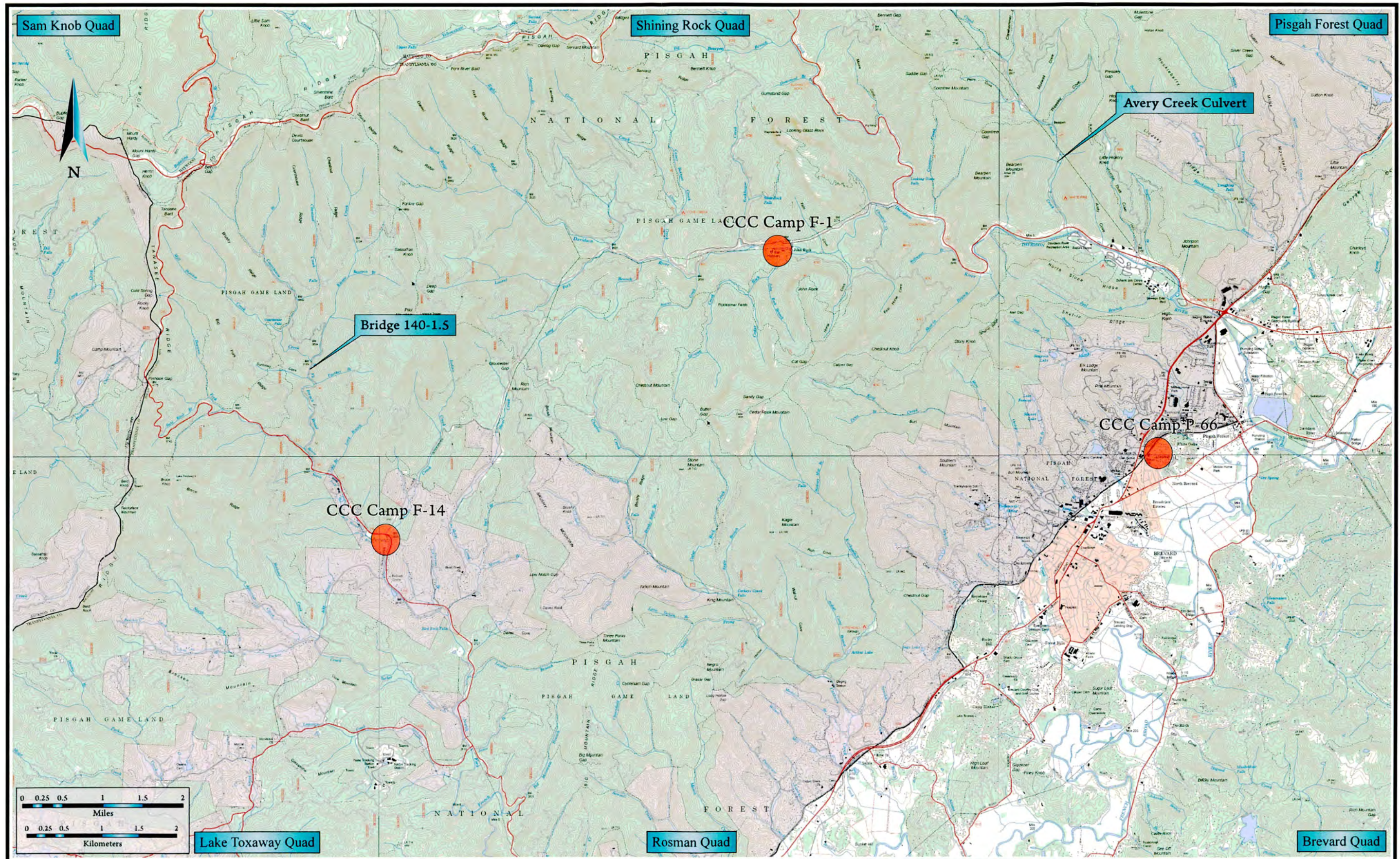


Figure 2. The locations of Bridge 140-1.5 on Courthouse Creek and the Avery Creek Road culvert on FSR 477, and nearby CCC camp locations on portions of the Sam Knob, Shining Rock, Pisgah Forest, Lake Toxaway, Rosman, and Brevard 2013 USFS topographic quadrangles.

surrounding property that combined nearly fifty small farms and ten “country places” (Boland et al. 1979:76). The 1890 purchase by Vanderbilt of nearly 69,000 acres from the State of North Carolina in the area that would come to include the current Avery Creek project area had originally been a part of the 250,240-acre grant (No. 251) first acquired by David Allison in 1796. This early land grant included acres that would eventually become portions of Buncombe, Henderson, Haywood, and Transylvania counties (Snedeker et al. 1997:1). Not surprisingly, the Allison Grant also included the current Courthouse Creek project area located west of Gloucester Gap and that area known as the headwaters of the French Broad River.

A review of the Forest Service Land Acquisition Files curated at the National Forests in North Carolina facility in Asheville indicates that the former Vanderbilt holdings in the general Davidson River valley area in Transylvania County and including other tracts that extended into Buncombe and Henderson counties was then divided into at least 12 tracts, some of which were contiguous with one another. These tracts were designated P-V-1, P-V-2, and so on up to P-V-12. Among these 12 tracts, the Avery Creek project area lies for the most part within that tract formerly known as P-V-1—a large parcel including some 12,984 acres (Land Acquisition Map 8-29). The P-V-1 tract and others were sold by Edith Vanderbilt to the United States Government over the course of several years beginning in 1916 and continuing up to 1921. In the end, Ms. Vanderbilt relinquished title to some 86,700 acres of that area formerly managed as the Vanderbilt’s “Pisgah Forest,” which today forms the core of the Pisgah National Forest, a tract that currently includes approximately 155,000 acres in Buncombe, Haywood, Henderson, and Transylvania counties. Figure 3 below provides a view of the current Courthouse Creek and Avery Creek project areas as illustrated on a 1906 Transylvania County soil survey map, recorded only a few years after George and Edith Vanderbilt’s acquisition of both project areas and their incorporation within the larger Pisgah Forest preserve.

In his study of the Highway 50 corridor in the Pisgah National Forest, USFS archaeologist Scott Ashcraft (2001) identified the area located west of Gloucester Gap and including the headwaters of the French Broad River as formerly situated within the 10,028-acre Silverstein Tract (P-126). Operating as the Gloucester Lumber Company from Rosman, North Carolina, Silverstein aggressively logged much of the 10,000 plus-acre tract. A 1924 USFS land acquisition map of Tract P-126 identified most of the parcel as “Cutover.” Even still, Silverman was allowed an additional 10-year contract issued by the US Forest Service in 1925 for the purposes of extracting timber and other forest products. His contract expired in April of 1935 (Ashcraft 2001:8-9).



Figure 3. The locations of Bridge

*Civilian Conservation Corps*

Perhaps second only to the creation of and subsequent administration of the Pisgah National Forest, one other federally administered project or operation that had a lasting impact on the immediate Courthouse Creek and Avery Creek project areas was the establishment of the Civilian Conservation Corps during the second quarter of the twentieth century. The Civilian Conservation Corps (CCC) was authorized by the Emergency Conservation Work Act of March 31, 1933. Designed to alleviate the plight of the poor and unemployed during the Great Depression, the CCC employed nearly three million 18-25 year olds to improve and preserve America's forests, parks, and agricultural lands (Rawick 1957; Salmond 1976). Projects undertaken by the CCC included erosion control, land and forest restoration, transportation improvements, and towards this end the construction of hundreds of miles of new roads, and thousands of bridges and culverts like those in the Courthouse Creek and Avery Creek project areas. In North Carolina alone, a total of 1,502 bridges of various types were constructed by the workers from as many as 45 CCC camps located across the Tarheel state. Nationwide, the total number of bridges constructed by the CCC totaled more than 47,000 (Merrill 1981; Jackson 1994; Ashcraft and Snedeker 1999). Of the 25 camps eventually constructed on National Forest lands in North Carolina, the camps that operated from Balsam Grove, the John Rock area, and Brevard/Pisgah Forest were the closest to the Courthouse Creek and Avery Creek Road project areas (see Figures 2-4). For example, the CCC camp located in the Balsam Grove area (NC F-14) was situated only 2.1 linear miles south of Bridge 140-1.5 at Courthouse Creek. Camp John Rock (NC F-1) was located in the same floodplain area as the Davidson River Fish Hatchery and archaeological site 31TV697 (Snedeker et al. 1995; Shumate 2004), and as such was situated approximately 5.5 linear miles northeast of Bridge 140-1.5. Camp NC F-1 was situated approximately 3.3 linear miles southwest of the recent culvert project area on Avery Creek Road. A third CCC camp known as Camp Sledge (NC P-66) was located on private lands in an area situated between and approximately equally distant from Brevard and Pisgah Forest, North Carolina. Camp Sledge was located approximately 3.5 miles southeast of the culvert project area on Avery Creek Road and 9.7 linear miles southeast of Bridge 140-1.5 on Courthouse Creek. This camp operated on privately-owned forest lands was located approximately 4.9 linear miles southeast of Camp John Rock.

When attempting to determine which of these three CCC camps provided the labor to construct the bridge at Courthouse Creek and which the culvert at Avery Creek Road, it would seem most likely that the camp situated closest to each of these project areas was responsible for the bridge or culvert located closest to it. However, there is no small room for confusion as to camp location and/or the location of a specific CCC Company, given that a particular company of corpsmen might work from a side camp location or that company might move wholesale from one camp to the next. If a camp was shut down, but later reopened, it usually kept the same camp name, but was given a new number. Such was the case with Camp

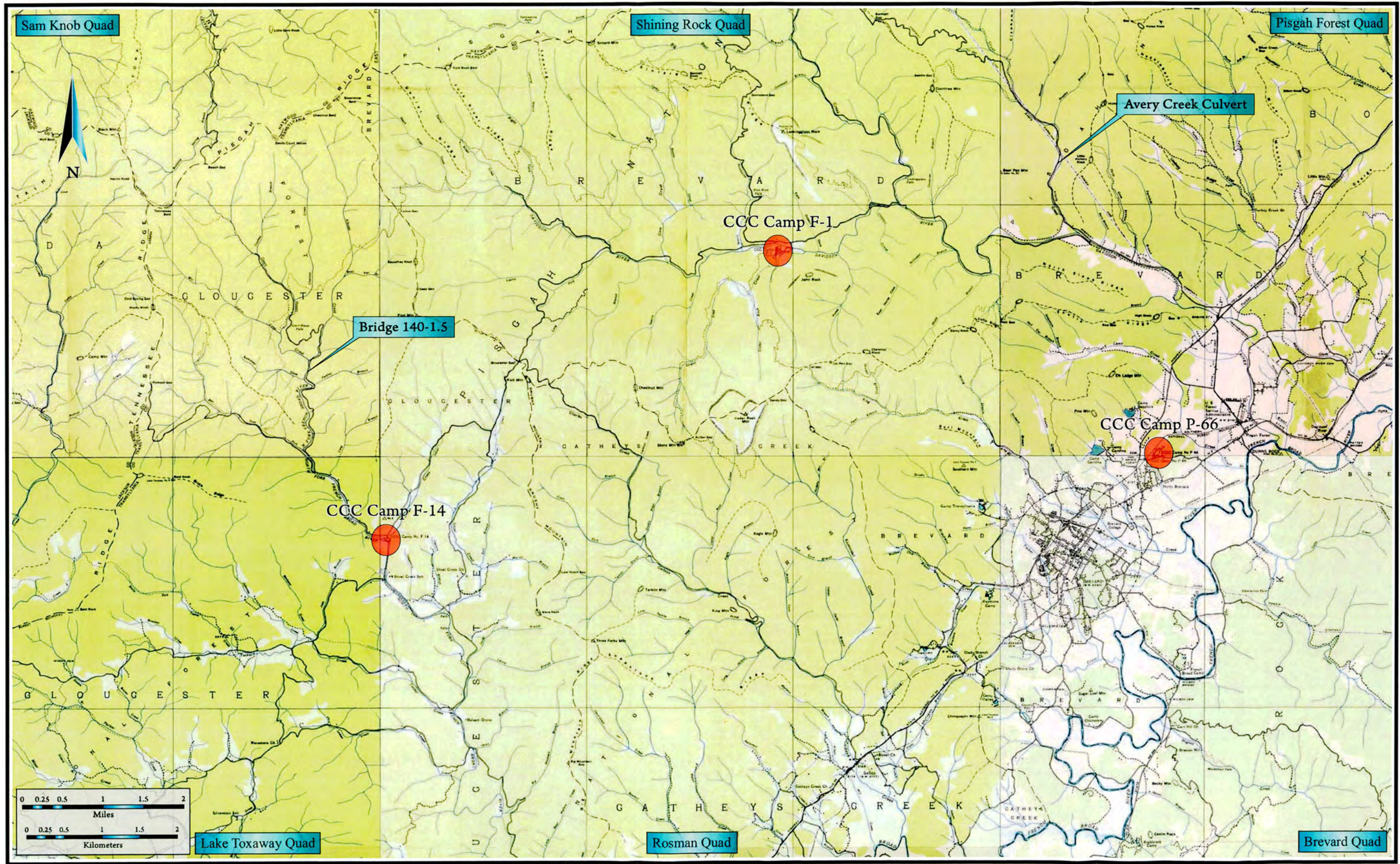


Figure 4. The locations of Bridge 140-1.5 on Courthouse Creek and the Avery Creek Road culvert on FSR 477, and nearby CCC camp locations on portions of the Sam Knob, Shining Rock, Pisgah Forest, Lake Toxaway, Rosman, and Brevard 1935 USFS topographic quadrangles.

John Rock, which began as NC F-1, was closed for a number of years, but was then reopened as NC F-28 still under the name of Camp John Rock. Jolley (2007:140-143) offers a summary of all North Carolina CCC camps according to Camp Number, Company Number, Camp Name, and Camp Location (by post office/county). Note that the re-opening of Camp John Rock as NC F-28 by CCC Company 28 (formerly of Balsam Grove) indicates that the Balsam Grove corpsmen moved from one camp to the other, but maintained their company designation. Further complicating the matter was NC F-26 Company 428 whose camp name was Pisgah Forest, but whose post office was identified as Brevard. Camp John Rock's post office was first identified as Pisgah Forest (under Company 401), but later identified as Brevard (under Company 428). The post office associated with Camp Pisgah Forest (under Company 428) was also identified as Brevard. When Company 428 mustered out of Camp Balsam Grove (NC F-14), its post office was designated as Balsam Grove. When CCC Company 3448 operated out of Camp Sledge, its post office was identified as Brevard. Table 1 below offers a summary of each of these CCC camps and CCC companies by camp name, camp number, location, and dates first occupied. Information provided in this table was gathered from the website [http://ccclegacy.org/CCC\\_Camps\\_North\\_Carolina.html](http://ccclegacy.org/CCC_Camps_North_Carolina.html), from Ashcraft and Snedeker (1999), and from Jolley (2007).

Table 1. Summary of those Civilian Conservation Corps Camps and Companies located within close proximity of the Courthouse Creek and Avery Creek Road project areas.

Camp No.	Company No.	Camp Name	Location (Post Office/County)	Date Occupied
NC F-1	402	John Rock	Pisgah Forest/Transylvania	May 19, 1933
NC F-14	428	Balsam Grove	Balsam Grove/Transylvania	June 22, 1933
NC F-26	428	Pisgah Forest	Brevard/Transylvania	???
NC F-28	428	John Rock	Brevard/Transylvania	May 22, 1938
NC P-66	3448	Sledge	Brevard/Transylvania	July 9, 1935

*Previous Archaeological and Architectural Investigations*

Any investigation of CCC-constructed facilities such as bridges, roads, and culverts in the Pisgah National Forest, if not the wider National Forests in North Carolina region, must inevitably draw heavily upon the comprehensive work of Ashcraft and Snedeker (1999) in their investigation of the CCC-built English Chapel Bridge and three other CCC-constructed bridges in the Davidson River and Avery Creek portions of Transylvania County. In this study, Ashcraft and Snedeker (1999) developed a number of important contexts specific for their study area, but also widely applicable to any similar project conducted within the region and concerning transportation, bridges, roads, and/or the Civilian Conservation Corps. Architectural historians Clay Griffin and Deborah Bevin also contributed to these transportation and bridge-related contexts (see also Griffin and Bevin 1999). In the Avery Creek and Davidson River project area, Ashcraft and Snedeker (1999) documented four CCC-constructed, Warren Pony Metal Truss bridges. Thought to



have been constructed between 1935 and 1936, the four bridges in their study area were evaluated as eligible for nomination to the National Register of Historic Places under Criteria A and C as structures (a) “associated with events that have made a significant contribution to the broad patterns of our history” and as structures that (c) “embody the distinctive characteristics of a type, period” and “method of construction.”

In 2001, USFS archaeologist Scott Ashcraft conducted an investigation of the Cove Creek Bridge on Highway 50 in the area east of Gloucester Gap in the Pisgah National Forest, and located only a few miles northeast of Bridge 140-1.5 on Courthouse Creek. Ashcraft (2001) considered the single lane, single span bridge at Cove Creek most likely to have been constructed by the CCC in 1939. Despite its probable association with the CCC, he evaluated the structure as ineligible for nomination to the NRHP. He concluded that the Cove Creek bridge lacked any rare or exceptional qualities, such as steel trusses, and that it was not associated with any distinctive CCC group, such as the National Greene/Buck Creek African-American CCC camp. He also noted the poor condition of the Cove Creek bridge and indicated that it was beyond the point of rehabilitation. Significantly, Ashcraft (2001) points to the 1939 construction date of the bridge at Cove Creek as evidence that it was most likely constructed by the members of CCC Camp NC F-28 at John Rock, who reoccupied the camp beginning in 1938. He noted that the CCC camp at Balsam Grove had closed by 1939. However, Camp John Rock was re-occupied by members of Company 428, who first operated from Balsam Grove, and not those of Company 402 that were first stationed at John Rock. Thus, the 1939 construction of the Cove Creek bridge and Bridge 140-1.5 on Courthouse Creek were both likely the craftsmanship and labor of Balsam Grove corpsmen, who by that date hailed from Camp John Rock on the Davidson River.

**METHODS OF INVESTIGATION:** As outlined above in the *Project Description* section of this report, the scope-of-work agreed to between the USFS/National Forests in North Carolina and BRAC called for the documentation and evaluation of Bridge 140-1.5 at Courthouse Creek and a single culvert located on Avery Creek Road. Field investigations at Courthouse Creek were conducted on July 1, 2015 by BRAC archaeologists Scott Shumate and Lorie Hansen. Those at Avery Creek Road were conducted on July 15, 2015 by Scott Shumate with the assistance of Sam Shumate—who assisted with photographic documentation. In both project areas, the architectural subjects of our investigation required significant cleaning (i.e. clearing of leaves, weeds, vines, shrubs, fallen trees, etc.) prior to their photo-documentation. All photographs were made in digital format. More than 500 photographs were taken—the vast majority of which represent different exposures and different angles of the same few subjects. Each subject bridge, culvert, headwall, etc. was photographed with and without either a metric scale or stadia rod (in feet). The scale of all BRAC drawings presented in the body of this report is recorded in feet and in meters, while those USFS drawings included here are presented in feet and inches. In most instances, measurements cited in the body of

this report are given in tenths of feet and in tenths of meters. Field sketches, both plan and profile, were accomplished with the aid of a flexible reel tape and hand-held compass. A battery of measurements was recorded for each structure to assist with field sketches and site and structure descriptions. In addition to these measurements, field notes also included descriptions of construction details, materials used, landform modifications, and site and structure condition. At each project area, at corners, center points, and/or terminal points on major structures, a number of locational coordinates were recorded using a hand-held GPS unit.

The field documentation of structures within the Courthouse Creek and Avery Creek project areas is complemented by the brief historical context presented above. The purpose of this archival research effort was to provide a context within which to measure the significance of those structures included in this investigation, and through this means arrive at an evaluation as to the potential of each to be nominated to the National Register of Historic Places. This background research was conducted at various stages during the investigation by Hansen and Shumate, and was aided and augmented by the earlier research of Pisgah National Forest Archaeologist Scott Ashcraft and Forest Archaeologist Rodney Snedeker. In particular, Civilian Conservation Corps context, bridge and culvert contexts, and previous investigations at comparable structures on the National Forest in North Carolina were provided by Ashcraft and Snedeker and have been briefly summarized above. Barry Jones, USFS engineer, provided valuable bridge inspection data and other information specific for the Courthouse Creek project area. Original USFS field drawings and inspection data gathered from these inspection reports are reproduced below with the permission of the National Forests in North Carolina.

**INVESTIGATION RESULTS:** The 2015 investigations in the Courthouse Creek and Avery Creek Road project areas conducted by BRAC included the documentation of one 1939 bridge structure and one stone and steel culvert likely of comparable age. Bridge 140-1.5 over Courthouse Creek is located in the northwestern most portion of Transylvania County and the Avery Creek Road culvert is located in the northeastern portion of the county. Both structures are located within the Pisgah Ranger District of the Pisgah National Forest. Figures 1 and 2 above provide the locations of these structures on recent maps of the general project area, while each structure is discussed, drawn, and photo-documented in greater detail below.

#### ⊕ **Bridge 140-1.5**

**Location** (UTM's from NAD WGS 84; Zone 17):  
 @ center of bridge: **Easting:** 328165 **Northing:** 3904000  
**Quad Sheet:** Sam Knob, NC  
**Land Form:** spanning Courthouse Creek/North Fork of French Broad River  
**Elevation:** 3,180 feet AMSL  
**Function:** single-span bridge  
**Structure Size:** 28 feet (e-w) max. length x 12.3 feet wide x 10.3 feet tall (water to subfloor)  
**Orientation:** 337 degrees NW-SE  
**Cultural/Temporal Affiliations:** 1939-present; likely constructed by CCC  
**Materials:** steel I-beam girders & cross braces; wood decking & curbing; wood & metal guard rails; poured, reinforced concrete abutments  
**Vegetation/Site Surface:** mixed hardwoods, conifers & rhododendron; rock ledges, boulders in stream channel  
**Structure Condition:** poor; decking has been breached (recently, temporarily patched); timber subflooring is crushed and splintered in places; one of two side rails is failing, the other slightly leaning; significant rust on most metal elements; erosion/undermining of base of concrete abutments at both ends of bridge  
**Research Potential:** fair; realized through present study  
**NRHP Recommendation:** not eligible

From the intersection of Parkway Road (NC 215) and Indian Creek Road (SR 1321) at Balsam Grove, North Carolina, Bridge 140-1.5 over Courthouse Creek can be reached by traveling nearly 1.2 miles northwest along NC 215 to its intersection with Forest Road 140. As its identifying number suggests, the bridge is located on FSR 140 at 1.5 miles north of its intersection with NC 215 (see Figures 1 and 2). At the point of its crossing Courthouse Creek, Bridge 140-1.5 is oriented approximately 337 degrees northwest, while this section of the creek flows nearly 215 degrees southwest. The approach roadway (FSR 140) is gravel. The vertical alignment of the road is gentle in its approach to and exit of the bridge. The horizontal alignment of bridge and road is that of an S-curve in which the bridge is located near the center of the "S." Figures 5 and 6 provide overview photographs of



Figure 5. Overview photographs of Bridge 140-1.5 and Courthouse Creek: a) Bridge 140-1.5, view to northwest; b) Bridge 140-1.5, view to southeast; c) upstream portion of Courthouse Creek, view to southwest; d) upstream portion of Courthouse Creek; view to northeast.



Figure 6. Overview photographs of Bridge 140-1.5 on Courthouse Creek: a) view to southwest; b) view to northeast.

the bridge and Courthouse Creek, while Figure 7 offers a USFS plan and profile sketch of the bridge.

### *Description*

Bridge 140-1.5 may be described as a single lane, single span bridge whose wooden decking is placed on twin I-beam girders that rest on reinforced concrete abutments. The decking is flanked by thick wooden curbs, which are in turn flanked by wooden upright posts to which steel guard rails are attached. The weight limit of the bridge is posted at 9 tons per single vehicle, while the limit for "Truck-Tractor-Semi-Trailer" is 13 tons. The length of the steel girders measures 26.5 feet by a width of 18 inches. The parallel placement of these beams includes separation of 6.9 feet on center. The wooden decking above these girders extends up to the line of the breast walls of the concrete abutments below to a length of 27.25 feet, while cross members at the very ends of the wooden decking extend its full length to a total of 28 feet. Between the 2 x 4-inch laminated decking of the upper surface of the bridge and the steel I-beams are a number of transverse wooden timbers measuring 4 x 8 inches placed on 16-inch centers. These wooden stringers are oriented perpendicular to the steel girders below and to the 2 x 4 decking above. The width of the bridge deck is 14.3 feet (not including the 6 x 8-inch guard rail posts). However, the wooden curbing located at the outer edges of the decking reduces the usable/drivable width of the bridge to 12.3 feet. The wooden guard rail posts-beveled at their tops-measure a maximum of 39 inches tall. Note that the guard rail placement as illustrated in Figures 8 and 9 below is not entirely correct. Currently, these metal rails are located at 1.75 inches below the top of vertical support posts. These several figures provide additional metrics not specifically mentioned in the text above. Moreover, Figure 10 provides details on the method by which the wooden decking and its side rails and the transverse stringers are attached to the steel girders below.

As noted above, these steel I-beams rest directly upon the concrete bridge abutments. The topmost interior portion of the breast walls of each of these winged abutments has been stepped or broadly notched to receive them. These breast walls average approximately 10.9 feet in width by a maximum of 10.4 feet tall (including the notched sill for the girders). The abutment at the north end of the bridge rests upon a prepared concrete footer whose width averages 17 inches wider than the breast wall and its two wing walls. The abutment located at the south end of the bridge rests directly upon the bedrock of the creek channel and consequently it is slightly less tall than its northern counterpart. The breast walls of both abutments include 5-inch square weep holes to allow for drainage from behind each wall. Each wing wall is angled approximately 25 degrees with respect to its adjoining breast wall. Although their metrics vary slightly, these wing walls average a maximum height of approximately 10.25 feet at the point at which they join with the breast wall and taper downwards to their outer extremities where they average approximately 5.3 feet tall. While wing walls and breast walls include thicknesses

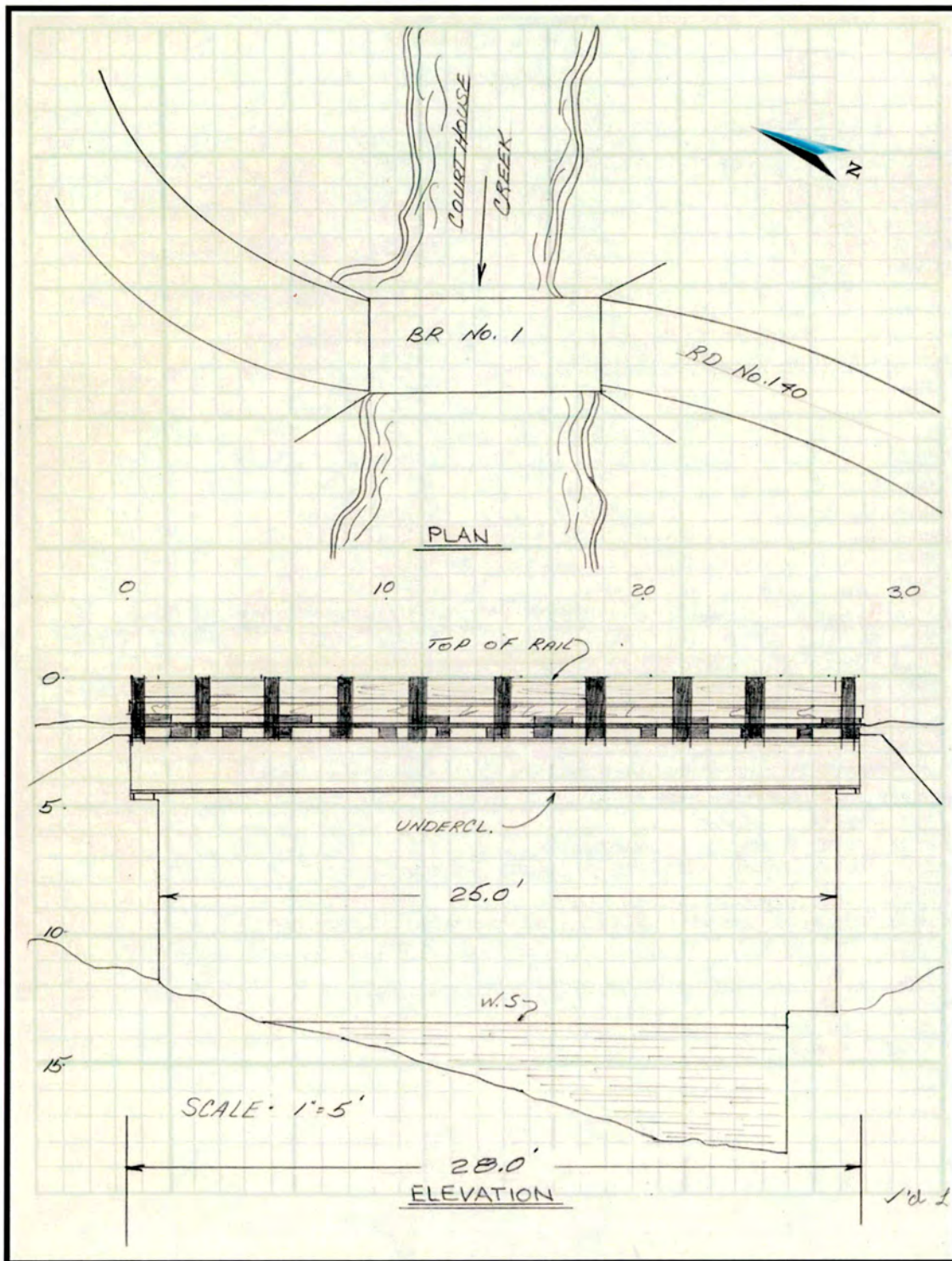


Figure 7. Plan (top) and northeast profile (btm) drawings of Bridge 140-1.5 on Courthouse Creek. Courtesy of USFS Engineering.

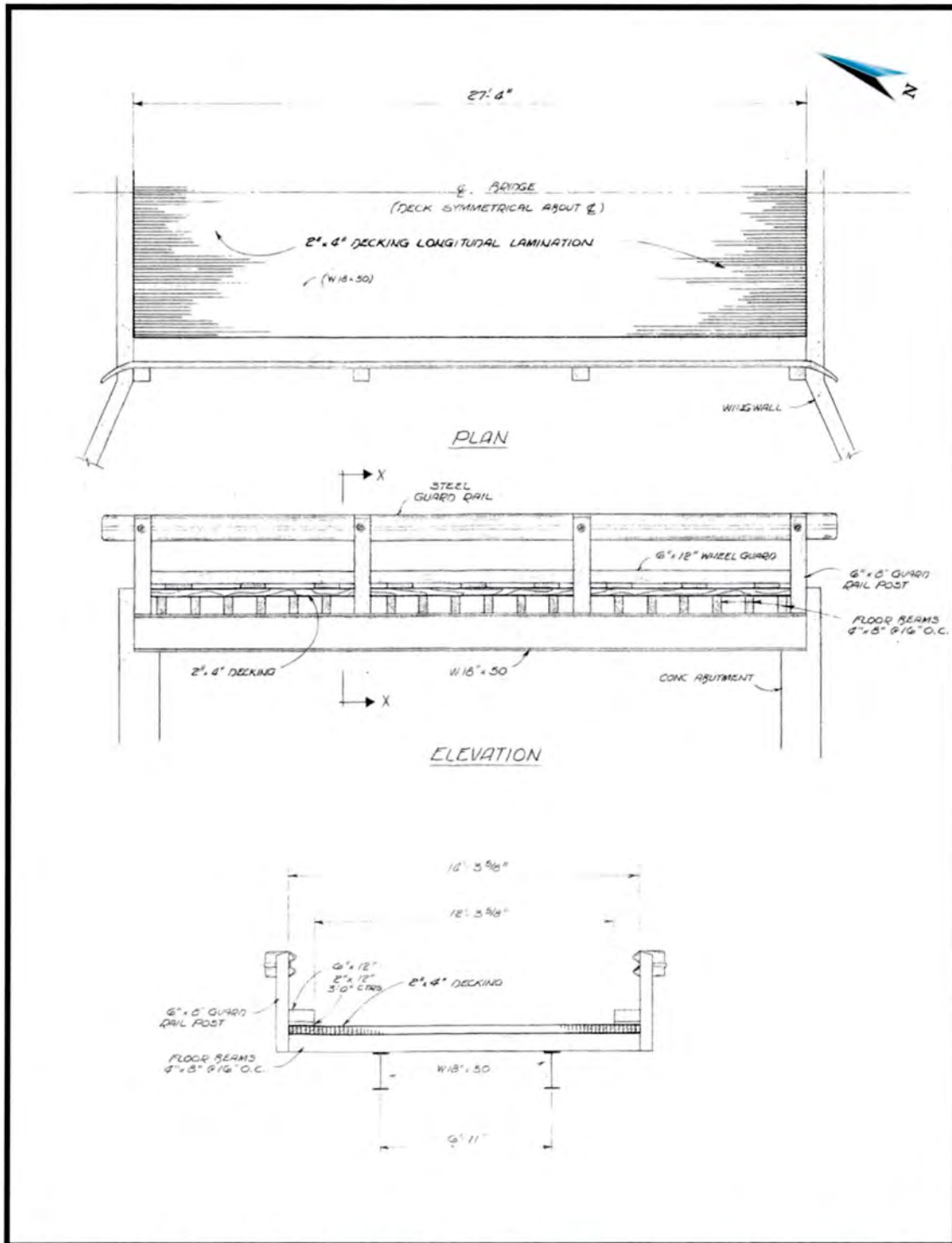


Figure 8. Plan (top), profile (middle), and cross-section (btm) drawings of Bridge 140-1.5 on Courthouse Creek. Courtesy of USFS Engineering.



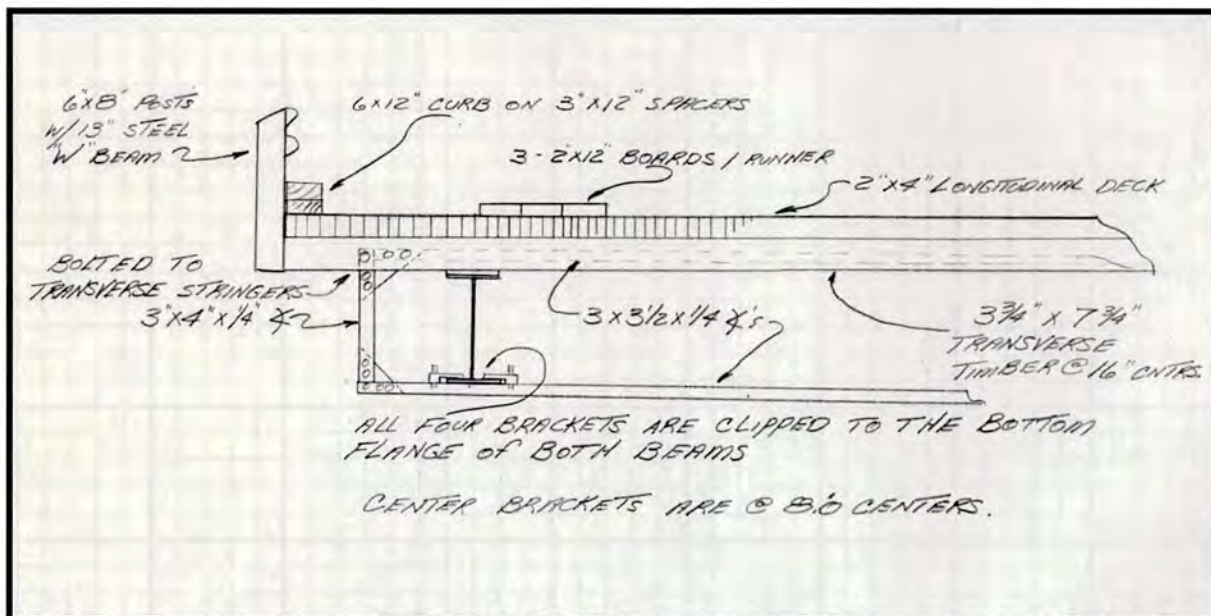


Figure 9. A profile drawing illustrating the method by which the wooden decking of Bridge 140-1.5 is attached to its supporting steel girders. Courtesy of USFS Engineering.

of as little as 7.0 inches at their tops, USFS profiles suggest a maximum width at their base of as much as 7.0 feet—though the latter width can no longer be measured given the fill deposited behind these abutments. At the time of the recent survey and evaluation, the surface of the water of Courthouse Creek as passed beneath the center of the bridge was measured at 8.1 feet below the steel girders and 10.3 feet below the wooden decking of the bridge.

#### Condition

The following represents an overall condition assessment and itemized list those bridge elements found faulty or failing, as summarized in a 2013 USFS inspection of Bridge 140-1.5 and as amended following the recent 2015 inspection by BRAC.

**Abutments:** The reinforced concrete abutments located at the north and south ends of the bridge appear to be structurally sound (see Figures 10 a-d). The bottommost six inches of both abutments exhibit greater wear and erosion of their concrete surfaces, but in no way could this be characterized as cracking or crumbling. At present there is no evidence of longitudinal or transverse fracture on either the breast walls or the wing walls of either abutment. However, the southwest corner of the southern wing wall is broken away, and there are noticeable voids between this wing wall and its adjoining breast wall and the boulder substrate on which they rest. In addition, there appears to be a considerable cavity behind the southwest end of the west wing wall of the southern abutment. The northern abutment rests



Figure 10. Overview and close-up photographs of the concrete abutments at Bridge 140-1.5: a-b) north abutment, view to northwest; c) south abutment, view to east; south abutment, view to southeast.

on a prepared concrete footer whose footprint measures approximately 1.4 feet wider than the outline of the vertical abutment. Although at present, the gravelly sand substrate in this part of Courthouse Creek appears to closely surround the footer of this abutment, earlier USFS inspections indicate that at various times the creek flow exposed a significant void beneath this abutment foundation. For example, a 1981 report documents the loss of as much as 30 inches of rock and soil from beneath the northeast wing wall and its adjoining breast wall (see Figure 11).

Superstructure: Rust, scaling, pitting, and peeling paint are readily apparent on the surfaces of both steel support girders (or I-beams) and on all flanges, bolts, nuts, brackets, and angle bars that constitute the metal web that ties these two beams together and to which the wooden deck above is attached. Estimates generated during the 2013 USFS inspection of Bridge 140-1.5 suggest that section loss due to rust and pitting ranges from 1/16" to 1/8" deep, while anchor bolts and nuts exhibit as much as 60% loss.

Deck: The laminated 2 x 4-inch bridge decking is significantly weathered, splintered, and in one section broken through. This recent break resulted in a temporary repair with the addition of layer of 2 x 10-inch planks laid down perpendicular to the long axis of the bridge. A second layer of 2 x 10 planks was then laid down above and perpendicular to the first (i.e. with the long axis of the bridge), but only as two parallel runs to correspond to the wheel-base of most vehicles. The upper surface of the original deck is now difficult to examine given the layer of new planking, but viewed from below, the damage and weathering is more apparent (Figures 12 a-d). Several of the original 4 x 8-inch transverse support timbers, on which the laminated 2 x 4-inch decking is laid, exhibit obvious fractures, splintering, and in at least one instance complete failure. The ends of many of these transverse support timbers are cracked and decayed. The failing south guard rail has resulted in the separation of several courses of the laminated 2 x 4-inch decking at that end of the bridge. The 4 x 12-inch wooden curbs or wheel guards are splintered and out of alignment at the base of the south end of the south guard rail. All curbing elements exhibit decay—especially in the north half of the south curb. Decay in the risers that lift the curbing timbers off the deck is even more advanced.

Railings: Bridge railing timbers are weathered, but for the most part functional (Figures 13a-d). Though not directly tested, the vertical guard rail posts appear to exhibit significant dry rot or decay. The horizontal W-beam steel portions of the guard rails exhibit significant rust on both interior and exterior surfaces. Reflective paint at the ends of the north and south railings is nearly gone in all cases. Vehicle impact to the south railing has resulted in a broken support bracket below deck and an increasingly angled side railing above, such that the latter now leans at its top as much as 1.4 feet out of alignment. The north end of the south railing and the north end of the northern railing are out of alignment by several inches.

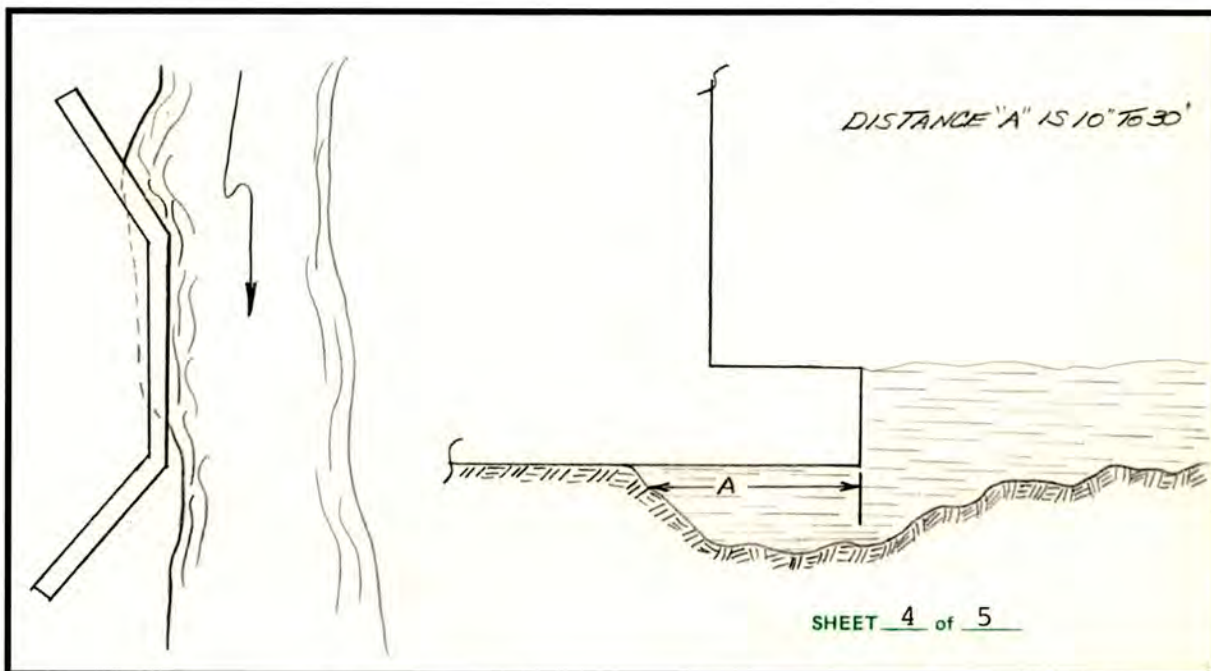


Figure 11. Plan view of the northern abutment on Courthouse Creek (left) and profile view (right) of base of same abutment illustrating the depth of void.

Although no attempt has been made to summarize each of the numerous inspection reports associated with Bridge 140-1.5 dating from 1979 to 2013, the following sample offers a view of summary conclusions regarding the overall condition of the bridge. While noting a split in one of the wooden stringers beneath the deck, a 1979 report nevertheless evaluated the bridge in “good condition.” A 1996 inspection concluded that the bridge was in “poor condition with major problems.” An inspection conducted in 2004 noted deteriorating paint, “much surface rust,” heavily rusted bearings, and an unchanged void in one of the wing walls. The report concluded by noting that “Many truckloads of gravel have been hauled over this road during reconstruction” with “no signs of distress.” A 2010 inspection ended with a moderately long list of recommended repairs. It is unclear how many were attempted. The 2013 summary report includes a somewhat shorter list of recommendations for repair, while overall condition ratings for various elements associated with both the roadway and bridge received marks between 3 and 6 on a scale 0 (critical failure) to 9 (excellent or no noticeable deficiencies). The one exception to these marks was the guard rail, which was given a ranking of 0—i.e. replacement recommended.

Since the 2013 inspection of Bridge 140-1.5, a number of structural elements have deteriorated further or in a few instances failed. For example, several of the transverse timbers located beneath the laminated decking have cracked—and one these is now nearly completely broken. The downstream guard



Figure 12. Overview photographs of the steel girders, steel angle brackets, wooden transverse joists, and laminated decking at Bridge 140-1.5: a) view to northeast; b) view to northwest; and c) view to southeast.



Figure 13. Overview and close-up photographs of the wood and steel railings at Bridge 140-1.5: a) south railing, view to north; b) south railing, view to southeast; c) close-up of broken support bracket on south railing, view to southeast; and d) north railing, view to southeast.

rail continues to list increasingly downstream at its south end and one of its support brackets is now hanging by a thread. It may also be the case that these wooden post and W-profile steel guard rails represent a latter (circa 1950s or 1960s) addition to the 1939 bridge over Courthouse Creek. The voids noted beneath and behind the south abutment of the bridge are still obvious and cannot be thought to have improved with time. The void previously noted beneath the north abutment was not obvious at the time of the 2015 inspection, but then no attempt was made to probe the space beneath the footer. Finally, the recently added decking constitutes an emergency repair following an incident in which a vehicle nearly broke through the old decking (Scott Ashcraft, personal communication 2015). Although Bridge 140-1.5 was most likely constructed by the Civilian Conservation Corps, and for that reason is a structure of historical interest, it must be argued that the bridge is now in poor condition and has become a safety concern. Records maintained by the USFS indicate that Bridge 140-1.5 is one a dozen bridges located within the Pisgah, Nantahala, and Grandfather Ranger Districts constructed between the years 1930 and 1941. The same records indicate that most of these other bridges are in a better state of repair and in some instances offer better examples of CCC-construction techniques and style—for example, exhibiting stone instead of poured concrete abutments. For these several reasons, Bridge 140-1.5 is evaluated as ineligible for nomination to the National Register of Historic Places. We find no objection to the proposed replacement of this structure and recommend that its replacement proceed with all due haste.

### ⊕ Avery Creek Road Culvert (CVT-01)

**Location** (UTM's @ NAD WGS 84): **Zone:** 17 @ **Easting:** 341952 **Northing:** 3907543  
(at center of east outflow wall)

**Adjacent Roadway:** FSR 477 at 0.86 miles north of Davidson River Road (US 276)

**Principal Drainage:** east trending tributary of Avery Creek

**Active Waterway:** Yes  No

**Drain Pipe Diameter:** 30 inches (76 cm); **Length:** ~ 24 feet (7.45 meters)

**Drain Pipe Orientation:** ~120° NW-SE

**Construction Details:** thick angular stone headwall and outflow walls; mortared joints; corrugated steel drain pipe

	<b>Headwall</b>	<b>Outflow Wall</b>
<b>Max. Height:</b>	2.5 feet (76 cm);	3.8 feet (1.17 meters)
<b>Max. Length:</b>	9.2 feet (2.79 meters)	11 feet (3.34 meters)

**Condition Overall:** poor

**Headwall:** poor; dislodged stones; loosened and lost mortar; poor craftsmanship (may represent later replacement);

**Outflow Wall:** fair; better craftsmanship overall; stones and mortar largely intact, but some displacement of stones at top; some loss of mortar

**Research Potential:** poor; realized through present study

**NRHP Recommendation:** not eligible

From the intersection of Davidson River Road (U.S. 276), Boylston Highway (NC 280), and Hendersonville Highway (U.S. 64) at Pisgah Forest, North Carolina, the Avery Creek Road culvert can be reached by traveling nearly 2.2 miles northwest along U.S. 276 to its intersection with Avery Creek Road (FSR 477). The culvert is located on FSR 477 at approximately 0.86 miles north of its intersection with U.S. 276 (see Figures 1 and 2). At this juncture, an unnamed tributary of Avery Creek passes through the steel culvert of the project structure, entering at its west headwall and exiting at its east outflow wall on an angle of approximately 120 degrees northwest to southeast. Figures 14a-c provide overview photographs of the Forest Road 477 and the headwall and outflow wall associated with the culvert, while Figure 14d provides a close-up view of the recent breach in the steel culvert that passes beneath FSR 477. Figure 15 offers a plan view drawing of the road and these culvert-related structures. Figures 16-21 offer profile photographs and profile drawings of the headwall and outflow wall structures.

#### *Description*

As summarized above, the corrugated steel culvert that channels a portion of the unnamed tributary of Avery Creek beneath FSR 477 includes a maximum diameter of approximately 30 inches or 76 centimeters. Its length is approximately 24 feet or 7.45 meters, and it is oriented approximately 120 degrees northwest to southeast, which places it on a slight angle to FSR 477 (i.e. not perpendicular to the roadway). The culvert includes a stacked stone, mortared headwall and outflow





Figure 14. Overview photographs of the Avery Creek Road culvert on FSR 477: a) view to south/southwest; b) headwall & breach in culvert, view to south; c) outflow wall, view to southwest; close-up of breach in steel culvert/FSR 477, view to northeast.

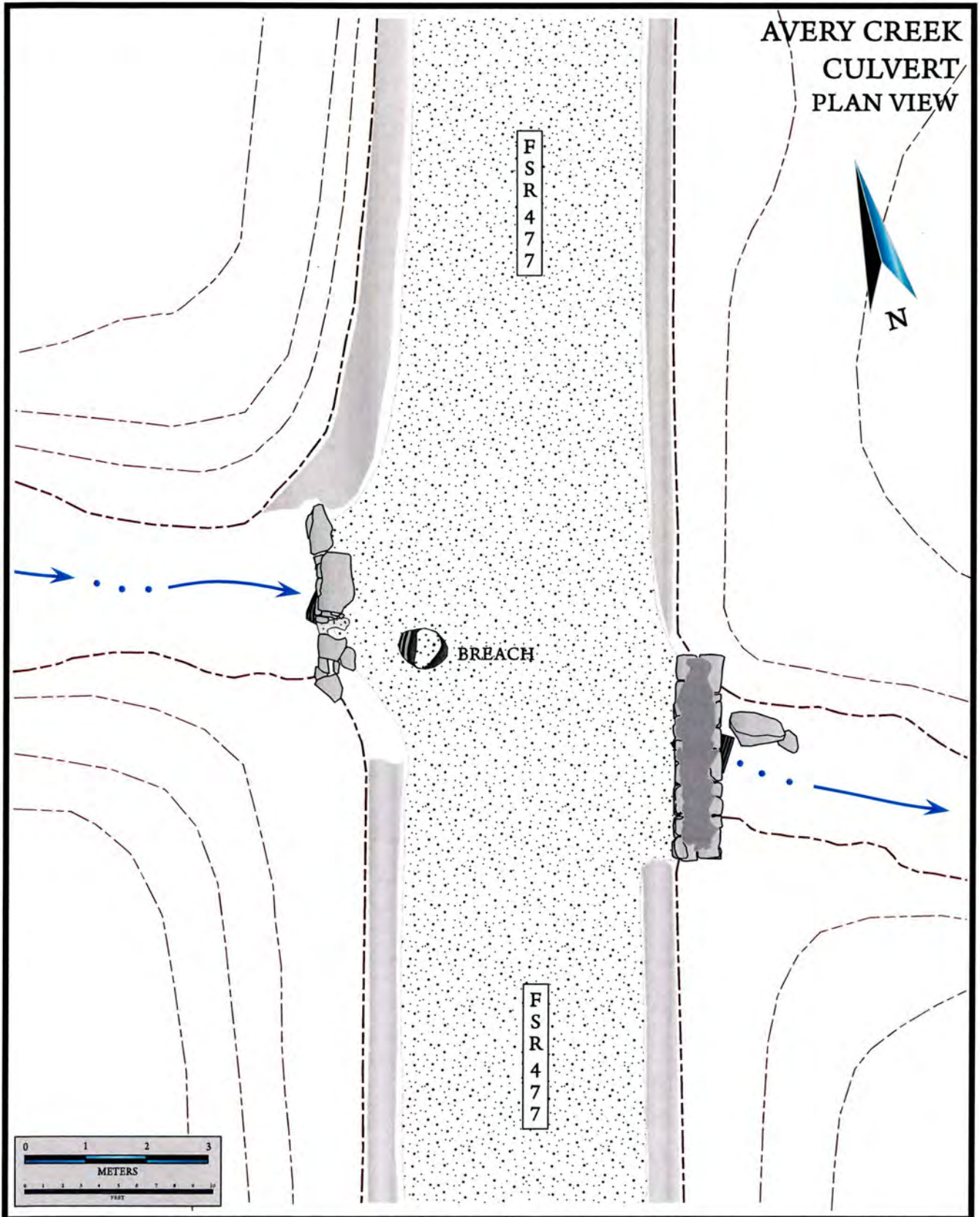


Figure 15. Plan view drawing of the Avery Creek Road culvert on FSR 477.



Figure 16. Profile view (with scale) of headwall at Avery Creek Road culvert. View to east.



Figure 17. Profile view of headwall at Avery Creek Road culvert. View to east.



Figure 18. East profile drawing of headwall at Avery Creek Road culvert on FSR 477.



Figure 19. Profile view (with scale) of outflow wall at Avery Creek Road culvert. View to west.



Figure 20. Profile of outflow wall at Avery Creek Road culvert. View to west.



Figure 21. West profile drawing of outflow wall at Avery Creek Road culvert on FSR 477.

wall. The headwall or intake wall measures approximately 9.2 feet (~2.8 meters) long at its top, but tapers from top to bottom such that the base of the wall as it lies in the creek measures approximately 5.0 feet (~1.55 meters) long. The width of the headwall at its top is difficult to measure as its topmost stones appear to be somewhat displaced. However, a conservative estimate would suggest a width of approximately 20 inches (51 cm). The headwall is highest at its center and at this point reaches a maximum height of approximately 2.5 feet (~76 cm).

The outflow wall located on the east edge of FSR 477 measures approximately 11 feet (~3.3 meters) long at its top, but tapers from top to bottom such that the base of the wall as it lies in the creek measures approximately 5.2 feet (~1.6 meters) long. The width of the outflow wall at its top is fairly uniform and averages approximately 25 inches (~65 cm). The outflow is highest near its center and at this point reaches a maximum height of approximately 3.8 feet (~1.17 cm).

For the most part, the stones of both the headwall and outflow walls may be characterized as tabular in shape and were likely cut from a nearby quarry or roughly dressed from even more local resources. Many, if not most of the stones of both walls are at least loosely mortared together. However, particularly in the case of the headwall, the mortar has eroded from or crumbled from the between the interstices of many of these stones. In other areas, the appearance of the mortar as originally applied indicates that much less care was taken with the headwall than with the construction and finish of the outflow wall to the east. This same less-than-professional appearance of the headwall is also revealed in the arrangement and size-ordering of the stones, which on the whole indicate a number of poor choices and placements. A close comparison of the headwall and outflow wall would seem to indicate that two different masons of very different skill levels were involved with their construction.

#### *Condition*

As noted above, the mortar that binds the stones of both the headwall and the outflow wall is eroded in places, and this is especially the case near the base of both walls and in those areas immediately surrounding the steel culvert. The slap-dash and at times globular appearance of the mortar bond finish of the headwall contrasts with the smooth and more narrowly pointed bonds of the outflow wall. It is also clear that the mason of the outflow wall made a much more concerted effort to arrange stones in such a way that the end result was an exterior (east wall) surface that may be characterized as smooth and plumb, where the face of each stone was closely aligned with each of those beneath it and beside it. The same cannot be said of the western headwall. Despite the extra care and greater craftsmanship applied to the outflow wall, the stonework of this particular wall has suffered significant damage. The top four courses of stone in the north half of the wall are now pushed eastward by several inches and the northernmost and topmost several courses of stone have separated from the rest and settled downward by

several inches. The displacement of these stones is likely the result of impact with a heavy machinery or logging truck. Not surprisingly, the more poorly constructed west headwall has also suffered loss of integrity over time. Several of its uppermost stones are now displaced, while others appear to be missing. Stones at the north end of this wall may have been displaced by those who maintain the roadside ditches—one of which empties immediately adjacent to, if not onto the north end of the headwall. Most adversely impacted has been the corrugated steel pipe that passes beneath the Forest Road from headwall to outflow wall. Rust likely created a weak surface near its western end and the passage of some particularly heavy vehicle has recently created a breach in the top of the pipe and in the surface of the road (see Figures 14d and 15). The placement of a reflective caution sign on one side of this hole prevents others from driving over it, but its occurrence may indicate that the integrity of other portions of the steel pipe are also nearly as compromised.

While the craftsmanship apparent in the stonework of the outflow wall of the Avery Creek Road culvert is consistent with that observed for other culverts constructed by the Civilian Conservation Corps in the 1930s and early 1940s at various locations across western North Carolina and particularly within the National Forest, the appearance and construction details of the western headwall may indicate a later replacement of an earlier CCC-constructed headwall. Together with the poor condition of the headwall, the impacts and damages noted for the outflow wall, and the breach in the culvert between these two wall, the overall condition and integrity of the Avery Creek Road culvert must be judged as poor. While an association of at least the outflow wall with the CCC is likely and therefore of historical interest, it is difficult to argue the historical significance of such a poor example of their otherwise fine craftsmanship. Dozens of better examples of their work continue to survive at a variety of locations in western North Carolina—not the least of which are those dozens of CCC-constructed culverts recently documented at the Coweeta Hydrologic Laboratory in Macon County (Shumate and Hansen 2014). For these reasons, the culvert at Avery Creek Road is evaluated as ineligible for nomination to the NRHP and no further investigation or documentation of this structure is recommended.



**SUMMARY REMARKS & RECOMMENDATIONS:** The recent 2015 BRAC architectural survey efforts at the Courthouse Creek and Avery Creek Road project areas in Transylvania County has provided photo-documentation and measured drawings of Bridge 140-1.5 over Courthouse Creek and of a probable CCC-era stone and steel culvert on Avery Creek Road. The gradual erosion and degradation of both the bridge and culvert over more than half a century combine with recent structural failures at both structures to recommend to the US Forest Service the replacement of the bridge at Courthouse Creek and the culvert on Avery Creek Road. All proposed improvements are designed to enhance user safety and access to surrounding portions of the Pisgah National Forest. The construction of a new bridge at Courthouse Creek will have the added benefit of improving stream flow in an area that at times of high water is often impeded by the existing structure.

Despite the clear benefits of new bridge at Courthouse Creek and a new culvert at Avery Creek Road, these proposed improvements will clearly have an adverse effect on both the existing, historic bridge and culvert structures. While both structures are most likely referable to Civilian Conservation Corps projects in Pisgah National Forest during the 1930s or early 1940s, the poor condition of both the bridge and the culvert does not recommend NRHP eligibility in either case. While the number of such structures almost unavoidably declines with each passing year, neither structure is exceptional, and other, better examples of Civilian Conservation Corps bridges and culverts survive elsewhere in the National Forest, across the state and region. In conclusion, it is hoped that the photo-documentation, measured drawings, and historical context developed in this report may be considered to have realized the research potential of both historic structures and mitigates any adverse effects accruing from planned improvements within the Courthouse Creek and Avery Creek Road project areas. No further work is recommended in association with the proposed undertaking in either project area.

Table 2. Summary of architectural resources recently documented in the Courthouse Creek and Avery Creek portions of the Pisgah National Forest.

PROJECT SITE NO.	SITE TYPE/CONTENT	TIME PERIOD/AFFILIATION	CONDITION	RESEARCH POTENTIAL	NRHP ELIGIBILITY
Br-140-1.5	concrete, metal, & wooden single-span bridge	1939; CCC construction likely	poor	fair	not eligible
Culvert-01	culvert with corrugated metal pipe & mortared stone headwalls	ca. 1930s; CCC construction likely	poor	poor	not eligible

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