

Federal Highway Administration  
Eastern Federal Lands Highway Division

National Park Service  
U.S. Department of the Interior



# Final Environmental Assessment Projects BLRI 2D17 and BLRI 2A16

National Park Service and Federal Highway Administration  
Ashe and Alleghany Counties, NC

August 2019



1 **FINAL ENVIRONMENTAL ASSESSMENT FOR THE NPS/FHWA PROJECTS**  
2 **BLRI 2D17 AND BLRI 2A16, ON THE BLUE RIDGE PARKWAY, ASHE AND**  
3 **ALLEGHANY COUNTIES, NORTH CAROLINA**

---

4 **EXECUTIVE SUMMARY**

---

5 The National Park Service (NPS), in cooperation with the Federal Highway Administration (FHWA),  
6 proposes to replace/rehabilitate a total of four bridges, each of which dates to the original 1930's  
7 construction of the Blue Ridge Parkway (BLRI). Currently the bridges are structurally deficient and no  
8 longer meet current safety standards. The bridges are as follows:  
9

- 10 • BLRI 2A16 (Alleghany County)
  - 11 ○ Big Pine Creek Bridge #3, Structure 5140-077P, Mile Post 223.78
  - 12 ○ Big Pine Creek Bridge #6, Structure 5140-080P, Mile Post 224.7
  - 13 ○ Brush Creek Bridge #1, Structure 5140-081P, Mile Post 227.45
- 14
- 15 • BLRI 2D17 (Ashe County)
  - 16 ○ Laurel Fork Bridge, Structure 5140-159P, Mile Post 248.9
- 17

18 All of the proposed work lies within the NPS right-of-way. The project would replace/rehabilitate the  
19 bridges in a manner that maintains, to the extent practicable, the historic character of the bridges.  
20

21 This Environmental Assessment (EA) examines two alternatives; the No Action Alternative and the  
22 Proposed Action Alternative. The EA also discusses other alternatives that were dismissed from further  
23 consideration. The Proposed Action Alternative would replace/rehabilitate all four bridges along their  
24 current alignment. For the three 2A16 bridges, the project would replace the superstructure (deck and  
25 rails) with a design that would emulate the original rustic style. Stone masonry abutments would be  
26 partially preserved. Stone from piers designated for replacement would be salvaged and used as stone  
27 facing for the new piers to the extent practicable. For the 2D17 bridge, the project would be a complete  
28 replacement of the bridge. The proposed design would replicate the existing design as closely as possible.  
29 Stone veneer from the existing abutments would be removed and used to create a similar stone veneer  
30 for the new abutments, ditch, and stonewall to the extent practicable. Otherwise, new Elberton granite  
31 veneer would be used on the abutments, ditch, and stonewall to replicate the current veneer as closely as  
32 possible. Existing stone would be stockpiled and used for another future project, where applicable. The  
33 proposed design for all four bridges would preserve the original BLRI alignment and vistas to the extent  
34 practicable.  
35

36 The Proposed Action Alternative would have a less than significant adverse impact on vegetation;  
37 hydrology and water quality; wetlands; rare, threatened, endangered, and special status species; historic  
38 structures; and transportation and visitor use. The impacts to these resources are primarily direct impacts  
39 due to construction activities. During construction, vegetation and wetlands would be cleared to allow  
40 for machinery movement and access to the structures. These impacts would be minimized by re-grading  
41 and re-establishing the vegetation. An increase in water turbidity and noise would impact water quality.  
42 These impacts would be minimized by the implementation of best management practices (BMPs). The  
43 bridges are considered contributing resources to the proposed BLRI Historic District National Historic  
44 Landmark (NHL) nomination, which is currently under development by the NPS. The NPS has  
45 determined the project would adversely affect the historic significance of the bridges; therefore, a  
46 Memorandum of Agreement (MOA) was prepared under Section 106 of the National Historic

1 Preservation Act that describes the appropriate mitigation measures. No adverse impacts would occur to  
2 federally listed threatened or endangered species. The Proposed Action Alternative would have  
3 beneficial impacts to transportation and visitor use as the BLRI would remain open to visitors after  
4 construction is completed and the bridges are in improved condition.  
5

## 6 PUBLIC COMMENT

---

7 This EA will be on public review from May 1, 2019 through June 1, 2019. During this 30-day period,  
8 hardcopies of the EA may be requested by contacting Dawn Leonard, NPS Community Planner, at (828)  
9 348-3434. An electronic version of this document can be found on the NPS's Planning Environment and  
10 Public Comment (PEPC) website at <https://parkplanning.nps.gov/projectHome.cfm?projectID=82234>.  
11 This site provides access to current plans, environmental impact analyses, and related documents on  
12 public review. An electronic version may also be found at the FHWA, Eastern Federal Lands Highway  
13 Division's website at <https://flh.fhwa.dot.gov/projects/nc/blri2d17-2a16-environmental-assessment/>.

14  
15 If you wish to comment on the EA, you may submit comments through the PEPC website or mail  
16 comments to the name and address below. Before including your address, phone number, e-mail address,  
17 or other personal identifying information in your comment, you should be aware that your entire  
18 comment – including your personal identifying information – may be made publicly available at any time.  
19 While you can ask us in your comment to withhold your personal identifying information from public  
20 review, we cannot guarantee that we will be able to do so. We will make all submissions from  
21 organizations, businesses, and from individuals identifying themselves as representatives or officials of  
22 organizations or businesses, available for public inspection in their entirety.  
23

24 Mr. Ryan Kimberley  
25 Federal Highway Administration  
26 Eastern Federal Lands Highway Division  
27 Planning and Programming Office  
28 21400 Ridgetop Circle  
29 Sterling, VA 20166-6205

1 **Table of Contents**

---

2 CHAPTER 1 – NEED FOR THE ACTION ..... 1

3 INTRODUCTION ..... 1

4 Project Site Description ..... 1

5 NEED FOR THE ACTION ..... 8

6 Background ..... 8

7 Scoping ..... 12

8 ISSUES AND IMPACT TOPICS ..... 12

9 Issues and Impact Topics Retained for Further Analysis ..... 13

10 Vegetation ..... 13

11 Hydrology and Water Quality ..... 13

12 Wetlands ..... 13

13 Rare, Threatened, Endangered, and Special Status Species ..... 14

14 Cultural Resources ..... 14

15 Visitor Use ..... 15

16 Issues and Impact Topics Dismissed from Further Analysis ..... 15

17 Soils ..... 15

18 Wildlife and Wildlife Habitat ..... 16

19 Archeological Resources ..... 16

20 Cultural Landscapes ..... 16

21 Ethnographic Resources ..... 17

22 Air Quality ..... 17

23 Soundscapes ..... 18

24 Floodplains ..... 18

25 Visual Resources ..... 18

26 Socioeconomics ..... 18

27 Night Skies Initiative ..... 19

28 CHAPTER 2 – DESCRIPTION OF ALTERNATIVES and MITIGATION ..... 19

29 ALTERNATIVE 1: NO ACTION ..... 19

30 ALTERNATIVE 2: PROPOSED ACTION – REPLACE/REHABILITATE BRIDGES ON EXISTING

31 ALIGNMENT ..... 19

32 Staging and Construction Access ..... 22

33 Mitigation Measures ..... 23

34 ALTERNATIVES CONSIDERED BUT DISMISSED ..... 26

35 CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES ..... 27

36 CUMULATIVE IMPACTS ..... 27

37 VEGETATION ..... 28

38 Affected Environment ..... 28

39 Environmental Consequences ..... 30

40 HYDROLOGY AND WATER QUALITY ..... 32

41 Affected Environment ..... 32

42 Environmental Consequences ..... 34

1	WETLANDS .....	36
2	Affected Environment .....	36
3	Environmental Consequences .....	38
4	RARE, THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES.....	42
5	Affected Environment .....	42
6	Environmental Consequences.....	46
7	CULTURAL RESOURCES .....	48
8	HISTORIC STRUCTURES .....	48
9	Affected Environment .....	48
10	Environmental Consequences.....	48
11	VISITOR USE .....	50
12	Affected Environment .....	50
13	Environmental Consequences.....	52
14	CHAPTER 4: PUBLIC INVOLVEMENT AND COORDINATION .....	57
15	PUBLIC INVOLVEMENT.....	57
16	AGENCY AND ENVIRONMENTAL PERMIT COORDINATION .....	57
17	Agency Coordination.....	57
18	Permits .....	59
19	LIST OF PREPARERS AND REVIEWERS.....	59
20	CHAPTER 5: REFERENCES .....	61

1 **List of Figures and Tables**

---

2

3 Figure 1: Project Location Map ..... 3

4 Figure 2A: Limits of Disturbance (LOD)..... 4

5 Figure 2B: Limits of Disturbance (LOD)..... 5

6 Figure 2C: Limits of Disturbance (LOD)..... 6

7 Figure 2D: Limits of Disturbance (LOD)..... 7

8 Figure 3A: BLRI 2D17 Detour Map..... 55

9 Figure 3B: BLRI 2A16 Detour Map..... 56

10

11 Table 1: Mapped Vegetation Communities at Big Pine Creek Bridge #3, Big Pine Creek Bridge #6, and

12 Brush Creek Bridge #1 ..... 28

13 Table 2: Mapped Vegetation Communities at Laurel Fork Bridge ..... 29

14 Table 3: Vegetation Community Impacts..... 31

15 Table 4: Summary of Potential WOUS and Wetlands in the Big Pine Creek Bridge #3 RSA..... 37

16 Table 5: Summary of Potential WOUS and Wetlands in the Big Pine Creek Bridge #6 RSA..... 37

17 Table 6: Summary of Potential WOUS and Wetlands in the Brush Creek #1 RSA..... 37

18 Table 7: Summary of Potential WOUS and Wetlands in the Laurel Fork RSA ..... 38

19 Table 8: Summary of Potential Impacts to WOUS and Wetlands ..... 39

20 Table 9: USFWS – 2D16: Alleghany County Federally Listed Threatened and Endangered Species ..... 42

21 Table 10: USFWS – 2D17: Ashe County Federally Listed Threatened and Endangered Species..... 42

22 Table 11: NCNHP – Brush Creek Bridge #1 NCNHP State Listed Species Documented within the RSA

23 ..... 43

24 Table 12: State Listed Rare Plants Identified within each Bridge RSA for Alleghany and Ashe Counties 45

25

26

27

28 **List of Appendices**

---

- 29 Appendix A – Applicable Executive Orders, Regulations, & Policies
- 30 Appendix B – Agency Coordination Responses
- 31 Appendix C – Memorandum of Agreement

## GLOSSARY OF ABBREVIATIONS

1		
2	ACHP	Advisory Council on Historic Preservation
3	APE	Area of Potential Effects
4	ASR	Alkali-Silica Reaction
5	BA	Biological Assessment
6	BLRI	Blue Ridge Parkway
7	BMP	Best Management Practices
8	CBA	Choosing-by-Advantages
9	CEQ	Council on Environmental Quality
10	DBH	Diameter at Breast Height
11	DO	Director's Order
12	EA	Environmental Assessment
13	E&SC	Erosion and Sediment Control
14	EO	Executive Order
15	FEMA	Federal Emergency Management Agency
16	FHWA	Federal Highway Administration
17	FONSI	Finding Of No Significant Impact
18	HAER	Historic American Engineering Record
19	JMT	Johnson, Mirmiran & Thompson
20	LOD	Limits of Disturbance
21	MOA	Memorandum of Agreement
22	NCAC	North Carolina Administrative Code
23	NCDEMLR	North Carolina Department of Energy, Mineral, and Land Resources
24	NCDEQ	North Carolina Department of Environmental Quality
25	NCDOT	North Carolina Department of Transportation
26	NCDWR	North Carolina Department of Water Resources
27	NCNHP	North Carolina Natural Heritage Program
28	NCSHPO	North Carolina State Historic Preservation Office
29	NCSAM	North Carolina Stream Assessment Method
30	NCWAM	North Carolina Wetland Assessment Method
31	NCWRC	North Carolina Wildlife Resources Commission
32	NEPA	National Environmental Policy Act
33	NHL	National Historic Landmark
34	NHPA	National Historic Preservation Act
35	NLEB	Northern Long-Eared Bat
36	NPDES	National Pollutant Discharge Elimination System
37	NPS	National Park Service
38	NRCS	National Resources Conservation Service
39	NRHP	National Register of Historic Places
40	ORW	Outstanding Resource Waters
41	PEPC	Planning, Environmental, and Public Comment
42	RSA	Resource Survey Area
43	SWPPP	Stormwater Pollution Prevention Plant
44	THPO	Tribal Historic Preservation Office
45	USACE	U.S. Army Corps of Engineers
46	USFWS	U.S. Fish and Wildlife Service
47	VA	Value Analysis
48	WOUS	Waters of the U.S.

# CHAPTER 1 – NEED FOR THE ACTION

---

## INTRODUCTION

---

In 2015 and 2017, bridge condition assessments performed by the Federal Highway Administration (FHWA) identified four structures on the Blue Ridge Parkway (BLRI) in North Carolina that required replacement or repair (FHWA, 2016 and FHWA, 2017). The 2015 bridge condition assessments recommended the replacement or rehabilitation of three bridges in Alleghany County due to their overall poor condition. These bridges are Big Pine Creek Bridge #3, Big Pine Creek Bridge #6, and Brush Creek Bridge #1. Together, these three bridges compose the project BLRI 2A16. The 2017 bridge condition assessment identified severe cracking on the Laurel Fork Bridge. In the current condition, the bridge would require complete closure if repairs or replacement are not implemented in the next five years. The fourth bridge, the Laurel Fork Bridge (also known as the Laurel Fork Viaduct) composes the 2D17 project. This Environmental Assessment (EA) provides alternatives for the Proposed Action Alternative, including the No Action Alternative, and describes potential impacts resulting from the implementation of the Proposed Action Alternative.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the regulations of the Council on Environmental Quality (CEQ) for implementing the Act (40 Code of Federal Regulations [CFR] 1500-1508), the National Park Service (NPS) *Director's Order (DO) #12 "Conservation Planning, Environmental Impact Analysis, and Decision-Making,"* the NPS NEPA Handbook (NPS, 2015b), 23 CFR Part 771 FHWA Technical Advisory T 6640.8A, and other FHWA regulations, policies, and guidelines for implementation of NEP and CEQ regulations. Additionally, in accordance with the requirements of Section 106 of the National Historic Preservation Act (54 United States Code [U.S.C.] 306108) of 1966 and implementing regulations (36 CFR 800), the NPS would consider the impacts of this undertaking to historic properties in a separate, but parallel process.

In accordance with other laws and regulations, coordination or consultation, as appropriate, has been completed during the development of the EA to help guide the development of the proposed action, determine impacts of the proposed action, and identify mitigation measures. Applicable laws include the Clean Water Act of 1972 (33 USC 1251), Endangered Species Act of 1973 (16 USC 35), and National Historic Preservation Act of 1966 (16 USC 470), and National Park Service Organic Act of 1916 (54 USC 1). A detailed list of applicable Executive Orders (EO), Regulations, and policies are provided in Appendix A.

### Project Site Description

---

The BLRI, America's longest linear park, is a National Parkway and All-American Road noted for its scenic beauty. It connects the Shenandoah National Park to the Great Smoky Mountains National Park for a distance of 469 miles along the spine of the Blue Ridge Mountains. Construction began in 1935 but was briefly suspended during World War II. All sections were completed by 1987. The BLRI is more than just a roadway linking the two national parks, it is also a destination in itself. It comprises approximately 83,000 acres of land. In addition to the long roadway corridor landscape, there are 15 developed areas. With an average of 16 million visitors a year, it is one of the most heavily visited units within the National Park System (NPS, 2006a). It is open 24 hours a day, with the gates and/or roads only being closed due to inclement weather or road maintenance. Educational and recreational resources associated with the BLRI include camping, kayaking/canoeing, hiking, traditional music, photography, ranger-led programs, and Appalachian cultural and historical exhibits.

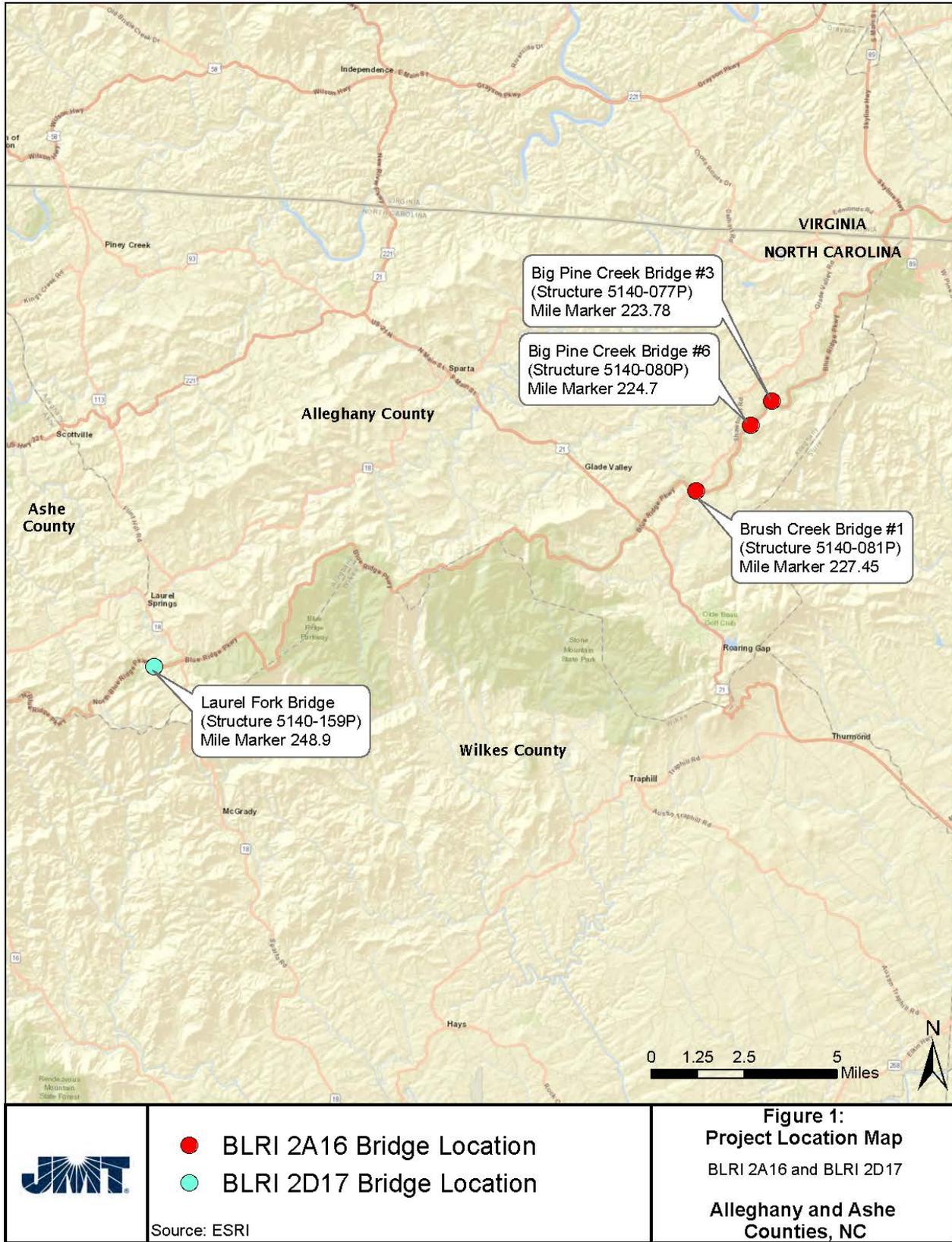
1 Because the BLRI was to be a destination in its own right, both scenic variety and the incorporation of  
2 recreational and education areas were prioritized during the design process. Many of the 168 bridges  
3 present along the BLRI are designed in a rustic style intended to blend into the landscape. The stone  
4 facing present on many of the bridges was obtained from quarries nearby the construction site or  
5 obtained from rock cuts created during the BLRI construction (NPS, 2015a). As a result, the appearance  
6 of many of the bridges imitates the changing geological areas present along the BLRI.  
7

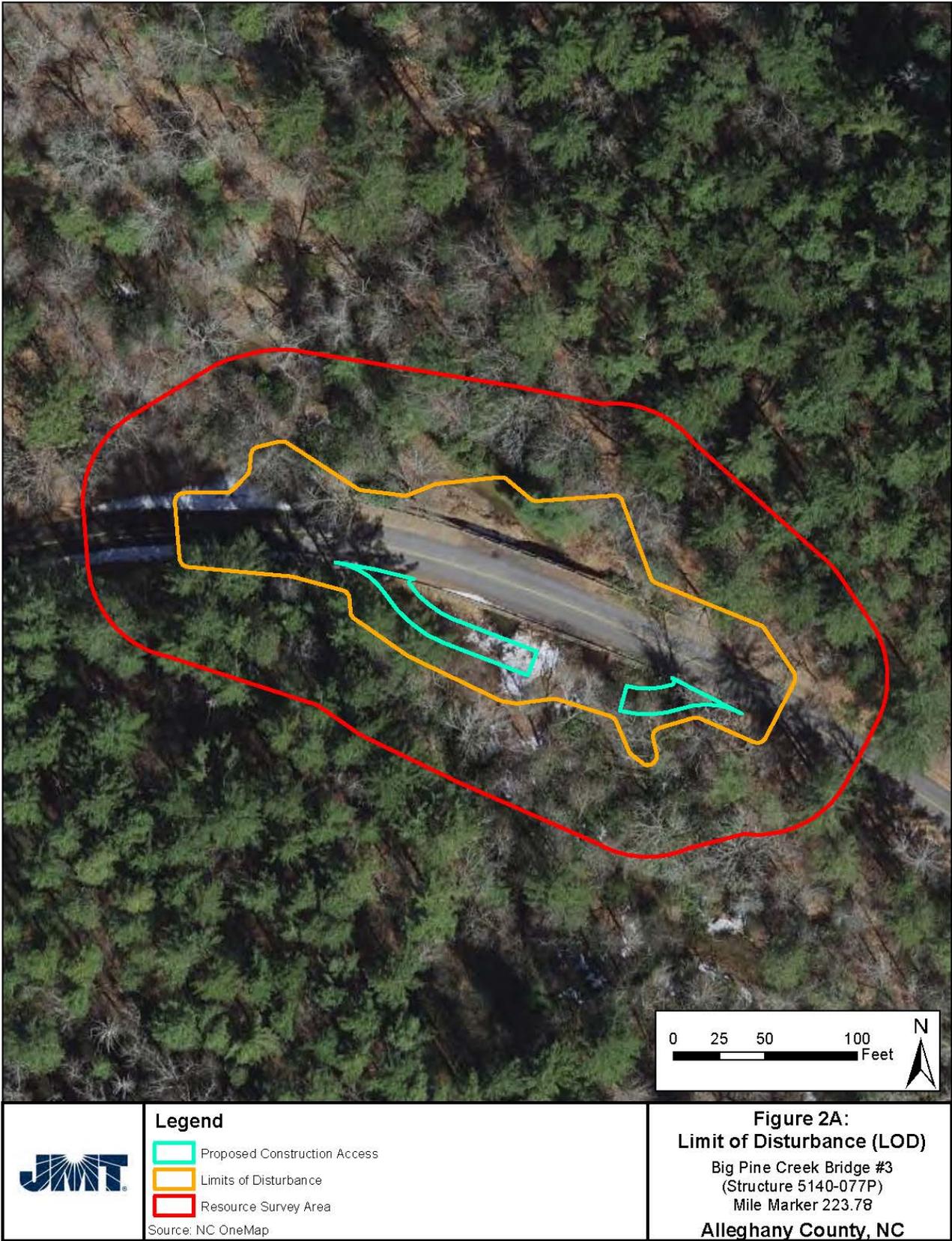
8 FHWA and NPS are proposing to replace/rehabilitate four bridges along the BLRI in Alleghany and Ashe  
9 Counties, North Carolina (Figure 1). The four bridges are as follows:

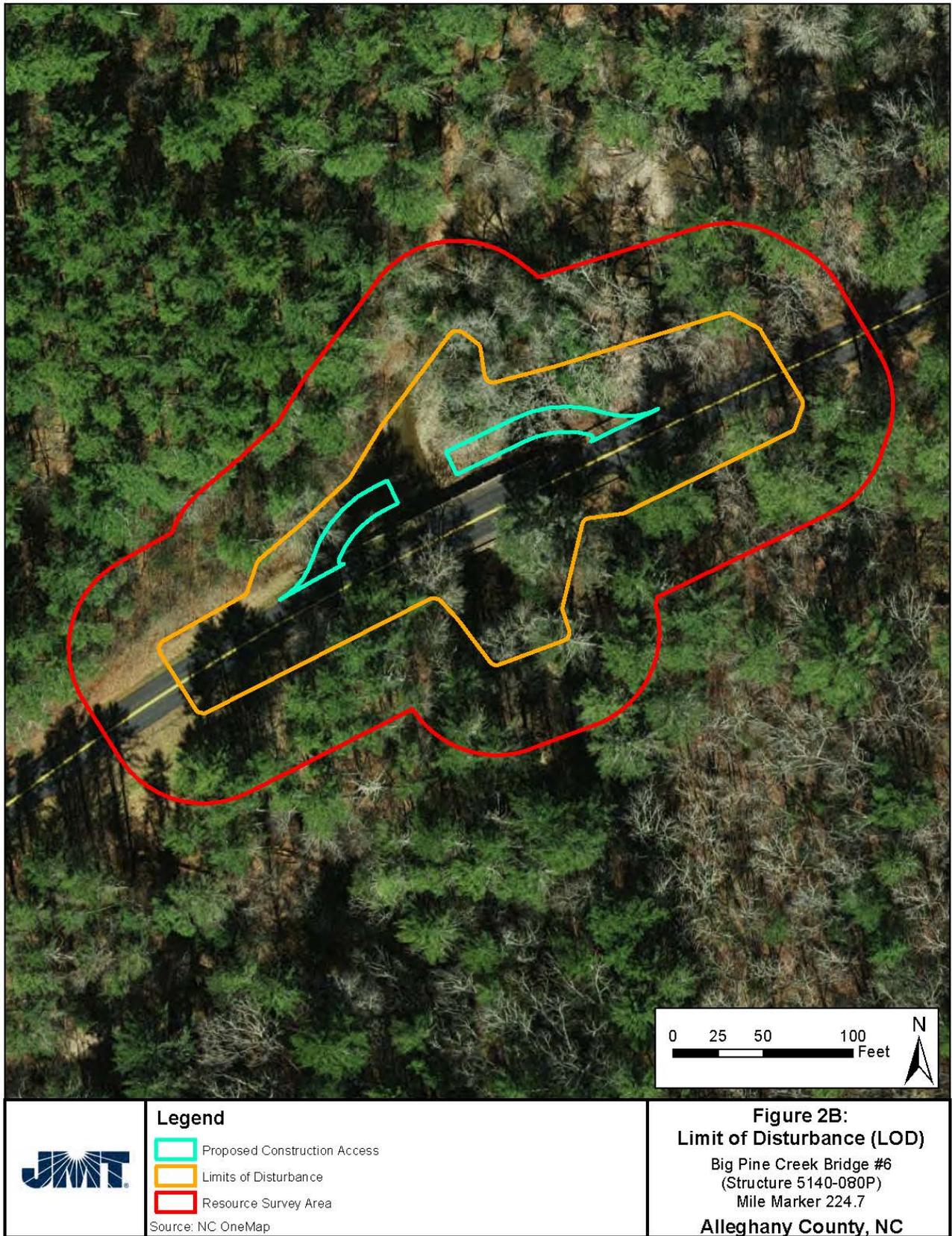
- 10 • BLRI 2A16 (Alleghany County)
  - 11 ○ Big Pine Creek Bridge #3, Structure 5140-077P, Mile Post 223.78
  - 12 ○ Big Pine Creek Bridge #6, Structure 5140-080P, Mile Post 224.7
  - 13 ○ Brush Creek Bridge #1, Structure 5140-081P, Mile Post 227.45
- 14 • BLRI 2D17 (Ashe County)
  - 15 ○ Laurel Fork Bridge, Structure 5140-159P, Mile Post 248.9

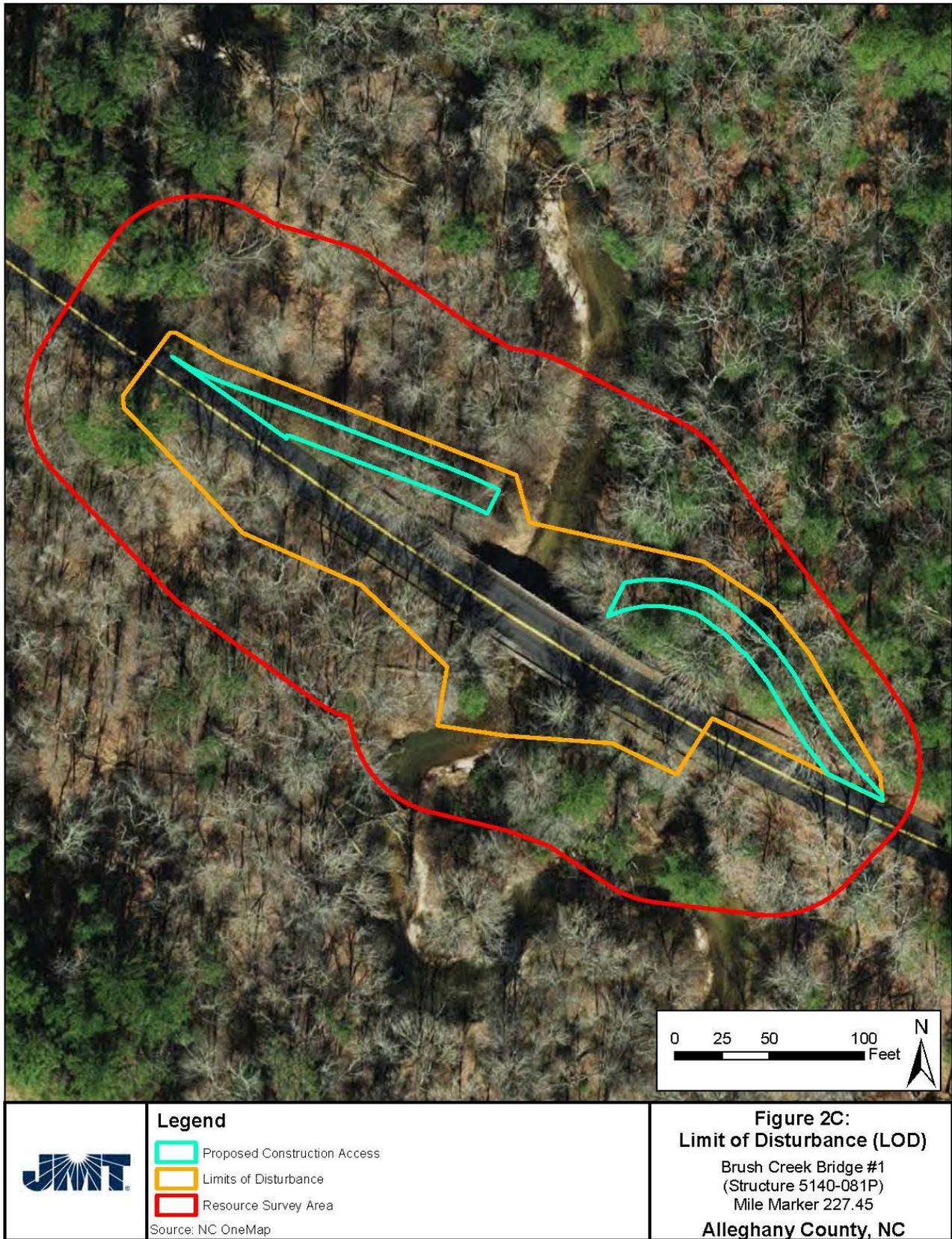
16  
17 The BLRI 2A16 bridges were constructed between 1936 and 1938 in the rustic style typically seen on the  
18 other structures of the BLRI, with a cast-in-place concrete deck, abutments, stone and concrete piers,  
19 and timber guardrails with concrete posts.  
20

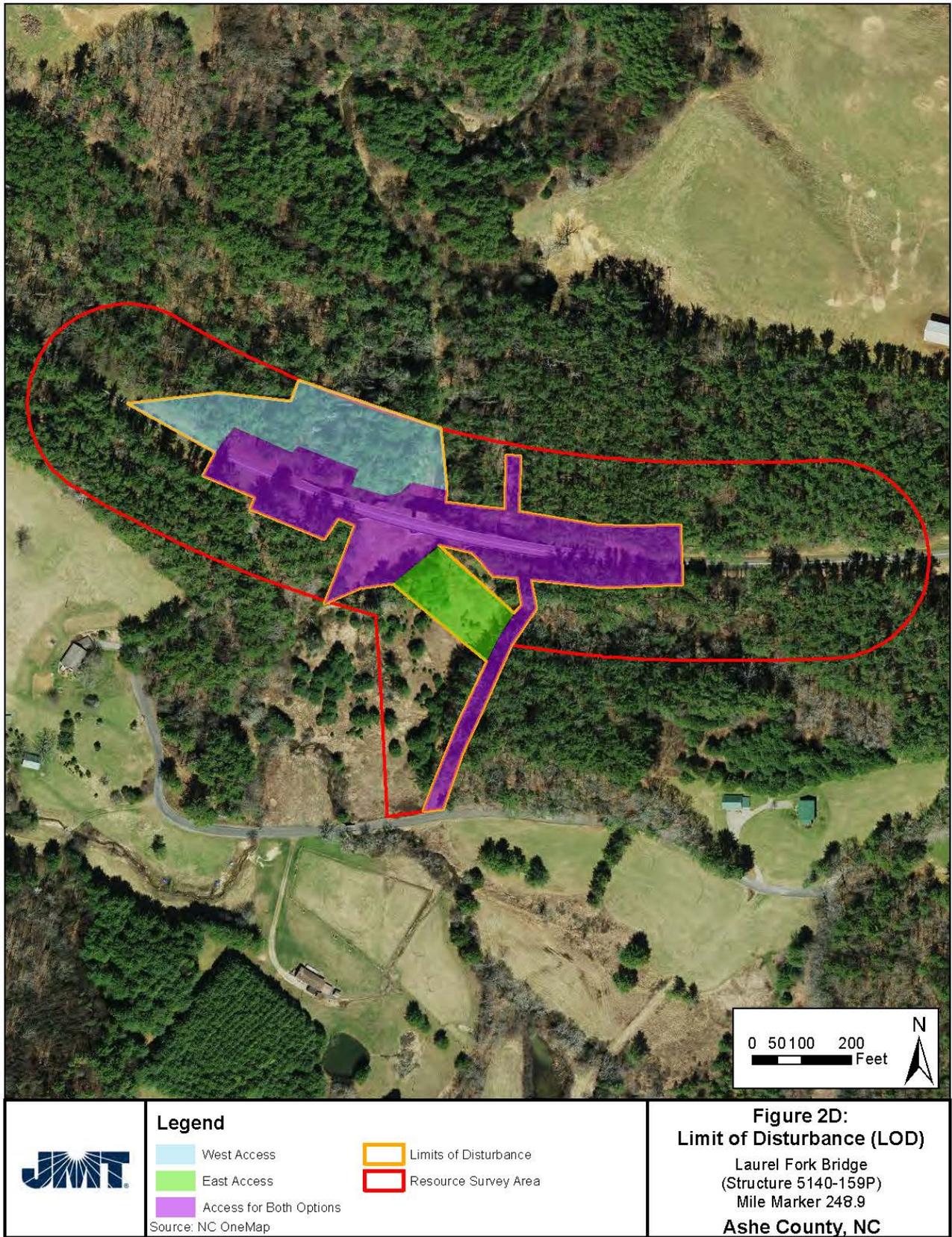
21 The Resource Survey Areas (RSAs) for the 2A16 bridges encompasses all areas approximately within 50  
22 feet of the proposed limits of disturbance (LOD) (Figure 2A through 2C). The RSA for the 2D17 bridge  
23 is defined as 200 feet from the roadway centerline (Figure 2D). The LODs for the 2A16 bridges  
24 encompass the areas for construction access. The LOD for the 2D17 bridge encompasses an area large  
25 enough for two construction access options. The FHWA has classified these bridges as having overall  
26 poor condition. The proposed project would include a replacement/rehabilitation on the current  
27 alignment to maintain to the extent practicable the historic character of the bridges and of the BLRI.











1 NEED FOR THE ACTION

---

2 This project is needed to replace/rehabilitate four BLRI bridges deemed structurally deficient and to  
3 improve safety by replacing substandard height railings according to current roadway design standards.  
4 NPS/FHWA propose to replace/rehabilitate the bridges on existing alignments in a manner that  
5 maintains to the extent practicable their historic character including roadway features and adjacent  
6 natural areas. The Laurel Fork Bridge is planned as a complete replacement; Brush Creek #1 and Big Pine  
7 Creek #3 and #6 are planned as deck replacements with existing abutments and selected piers retained  
8 for historic aesthetics. NPS/FHWA plan to keep the bridge rail appearance consistent with the existing  
9 rails to the extent practicable. Given the significance of the existing stone-faced abutments and piers as  
10 part of the cultural landscape, NPS proposes to preserve or reuse the original stone masonry where  
11 possible.

12  
13 **Background**

---

14 In 2015, the FHWA classified the 2A16 bridges as structurally deficient and recommended repair or  
15 replacement (FHWA, 2016).

16



17

18

19 Exhibit 1: Big Pine Creek Bridge #3, Structure. 5140-077P – Side view of bridge degradation

20

21 Big Pine Creek Bridge #3 was constructed in 1938. It is a three-span bridge consisting of a cast-in-place  
22 reinforced concrete slab supported by vertical cast-in-place concrete abutments and an intermediate  
23 wall. The abutments are clad with ashlar native stone and are set in earthen embankments. The concrete  
24 on the underside of the slab is exposed. The bridge has timber-framed rails which are backed with steel  
25 plates and mounted on concrete posts. The bridge carries the BLRI over Big Pine Creek, a shallow and  
26 low-lying tributary stream, through an area characterized by heavily wooded deciduous forest. The  
27 bridge is curved and set on a skew to the stream. Big Pine Creek Bridge #3 has a continuous concrete cast-

1 in place deck, stone-masonry abutments, and two concrete piers. The bridge has an asphalt wearing  
2 course over the deck, the bridge length is 69.8 feet, deck width is 36.7 feet, and curb-to-curb width is 33.3  
3 feet. The existing bridge rail has concrete posts and timber rail, and its height varies from 17 inches to 21  
4 inches, while the standard bridge height is 27 inches (FHWA, 2016). Exhibit 1 shows the current  
5 condition of the bridge.  
6



7  
8 Exhibit 2: Big Pine Creek Bridge #6, Structure. 5140-080P – Side view of bridge degradation  
9

10 Big Pine Creek Bridge #6 was constructed in 1937. It is a two-span bridge consisting of a cast-in-place  
11 reinforced concrete deck supported by cast-in-place concrete abutments and an intermediate wall. The  
12 abutments and intermediate wall are clad with stone – some, if not all of which is native ashlar stone – and  
13 set in earthen embankments. The concrete on the underside of the slab is exposed. The bridge has timber-  
14 framed rails which are backed with steel plates and mounted on concrete posts. The bridge carries the  
15 BLRI over Big Pine Creek, a shallow and low-lying tributary stream, through an area characterized by  
16 heavily wooded deciduous forest. The bridge is straight and perpendicular to the stream. Big Pine Creek  
17 Bridge #6 has a continuous concrete cast-in place deck, stone-masonry abutments, and a stone-masonry  
18 pier. The bridge has an asphalt wearing course over the deck, the bridge length is 59.5 feet, deck width is  
19 34.8 feet, and curb-to-curb width is 32.3 feet. The existing bridge rail has 18-inch high concrete posts and  
20 timber rail, while the standard bridge height is 27 inches. A joint was repaired on the bridge in 1983  
21 (FHWA, 2016). Exhibit 2 shows the current condition of the bridge.



1

2 Exhibit 3: Brush Creek Bridge #1, Structure 5140-081P – Side view of bridge degradation

3

4 Brush Creek Bridge #1 was constructed in 1936. It is a two-span, five girder bridge consisting of a cast-  
5 in-place concrete deck slab, supported by concrete abutments which are set into the slope of the stream  
6 channel, and an intermediate wall which is cast onto a concrete footing. The wing walls, abutments, and  
7 intermediate wall are clad with ashlar native stone. The bridge has timber-framed rails which are backed  
8 with steel plates and mounted on concrete posts. The bridge carries the BLRI over Brush Creek, a shallow  
9 and low-lying tributary stream, through an area characterized by heavily wooded deciduous forest. The  
10 bridge is straight and is set on a skew to the stream below. Brush Creek Bridge #1 has a concrete cast-in  
11 place deck, stone-masonry abutments, and a stone-masonry pier. The bridge has an asphalt wearing  
12 course over the deck, the bridge length is 68.0 feet, deck width is 34.0 feet, and curb-to-curb width is 29.5  
13 feet. The existing bridge rail has 19-inch high concrete posts and timber rail, while the standard bridge  
14 height is 27 inches. A joint was repaired on the bridge in 1983 (FHWA, 2016). Exhibit 3 shows the current  
15 condition of the bridge.



1

2 Exhibit 4: Laurel Fork Bridge, Structure 5140-159P – Under view of bridge degradation

3 Laurel Fork Bridge was constructed in 1939. It is a five-span bridge with a steel girder and concrete floor  
4 beam structure supported by concrete abutments which are set in the steep slope of the ravine, and  
5 concrete piers which are cast onto a wide concrete footing. The bridge is 546 feet long and 28 feet wide.  
6 The wing walls and abutments are clad with ashlar native stone, whereas the concrete on the underside  
7 of the deck is exposed. The bridge has a battered concrete parapet wall with a concrete rail. The bridge  
8 carries the BLRI over a steep ravine and Cranberry Creek. Cranberry Creek is a shallow tributary stream  
9 with a rocky streambed located at the base of the ravine, which is characterized by dense woodland  
10 vegetation and is surrounded by hilly terrain. The stream is centered between the middle support piers.  
11 The bridge is curved and perpendicular to the ravine. Some agencies and mapping may refer to Cranberry  
12 Creek as Laurel Fork; however, mapping from the North Carolina Department of Environmental Quality  
13 (NCDEQ), shows the stream flowing under the Laurel Fork Bridge labeled as Cranberry Creek (NCDEQ,  
14 2018b). The Laurel Fork Bridge is a five span, two-girder steel bridge with cast-in-place concrete deck.  
15 In January 2017, FHWA bridge inspectors conducted a bridge condition assessment and concrete study  
16 at the Laurel Fork Bridge and identified severe cracking (up to ¼ inch wide cracks) throughout the bridge  
17 piers due to freeze-thaw action and Alkali-Silica Reaction (ASR). ASR causes the formation of a  
18 hygroscopic gel due to the highly alkaline cement paste reacting with amorphous silica found in the  
19 aggregate material under sufficiently moist conditions. Expansion of this gel leads to spalling and  
20 eventually failure of the concrete (USDOT & FHWA, 2011). The structural condition history is as follows  
21 (FHWA, 2017):

22

23

24

25

26

- 1985 – substructure repairs due to heavy cracking and spalling, similar to the current condition,
- 2001 – minor cracks are noted in the biennial Bridge Inspection Report,
- 2011 – cracks progressed, crack gage installed at Pier 3,
- 2015 – ½ mm movement noted in 2015 biennial Bridge Inspection Report,

- 1 • 2016 – bridge was ranked #18 on the NPS Southeast Region priority list of bridges and a concrete  
2 study was initiated, and
- 3 • 2017 – concrete study was conducted in January 2017, findings of the study indicated widespread  
4 concrete deterioration.
- 5 • 2017 – Wind restriction implemented in February. The Laurel Fork Bridge closes when wind  
6 speed exceeds 60 miles per hour

7  
8 The current condition of the bridge would require closure if a solution is not implemented within the  
9 next five years. Exhibit 4 shows the current condition of the bridge.

## 10 11 Scoping

---

12 The framework and guidance for the scoping process is provided by the CEQ guidelines (CEQ, 1978) for  
13 implementing NEPA and the NPS’s NEPA guidelines. The NPS NEPA guidelines are contained in *DO #*  
14 *12 “Conservation Planning, Environmental Impact Analysis and Decision-Making”* and the National Park  
15 Service NEPA Handbook (NPS, 2015b). The scoping process is used to identify important issues,  
16 eliminate irrelevant issues, find relationships between other projects or documents, establish a timeframe  
17 for document creation and decision-making, define the purpose and need, identify agency objectives and  
18 constraints, and explore alternative options. As part of the scoping process for this project, information  
19 regarding the project was made publicly available via NPS’s Planning, Environment, and Public Comment  
20 (PEPC) website during the comment period, which occurred from August 10, 2018 to September 10,  
21 2018. In addition, scoping letters were sent to the following federal, state, and local agencies;  
22 organizations; and tribes: The U.S. Army Corps of Engineers (USACE), U.S. Forest Service (USFS),  
23 Environmental Protection Agency (EPA) NEPA Program Office, U.S. Department of Agriculture  
24 National Resources Conservation Service (NRCS) Area 1 Office Center and North Carolina State Office,  
25 Advisory Council on Historic Preservation (ACHP), U.S. Fish and Wildlife Service (USFWS) Asheville  
26 Office, North Carolina Department of Water Resources (NCDWR), North Carolina State Historic  
27 Preservation Office (NCSHPO), North Carolina Wildlife Resources Commission (NCWRC), North  
28 Carolina Natural Heritage Program (NCNHP), North Carolina Department of Energy, Mineral, and  
29 Land Resources (NCDEMLR) Winston-Salem Regional Office, North Carolina Department of  
30 Transportation (NCDOT), Alleghany County Board of Commissioners, Ashe County Board of  
31 Commissioners, High County Rural Planning Organization /High County Council of Governments, the  
32 New River Conservancy, the Blue Ridge Conservancy, Appalachian Voices, Mountains to Sea Trail, The  
33 Eastern Band of Cherokee Indians, the Absentee Shawnee Tribe of Oklahoma, the Catawba Indian  
34 Nation, the Eastern Shawnee Tribe of Oklahoma, the United Keetoowah Band of Cherokee Indians, the  
35 Cherokee Nation, the Shawnee Tribe, and the Tuscarora Nation.

36  
37 Copies of the agency responses are provided in Appendix B: Agency Coordination Letters & Responses.

## 38 ISSUES AND IMPACT TOPICS

---

39 An issue, as it relates to NEPA, describes the relationship between the affected environmental (natural,  
40 cultural, and socioeconomic) resources and the proposed project. An issue differs from an impact in that  
41 an issue describes only the association between the resource and the action, while an impact includes a  
42 description of the intensity of the action on the resource. Issues were identified for the purposes of this  
43 EA through both internal and external scoping processes. The following issues were identified for this  
44 proposed action:

- 1 • The bridges are considered contributing resources to the proposed BLRI Historic District NHL  
2 nomination. NPS has determined the proposed project would adversely affect the  
3 bridges/historic district.
- 4 • Suitable habitat for the Northern Long-Eared Bat (NLEB) (*Myotis septentrionalis*), a federally  
5 protected species, was identified within all four RSAs. Tree clearing, needed for construction of  
6 the bridges, may remove potential roosting and foraging habitat for the NLEB.
- 7 • Closure of the bridges for construction would result in the need for detour routes off the BLRI to  
8 safe route motorist around construction activities. These detours would temporarily impact  
9 transportation and visitor use of the BLRI.

## 11 Issues and Impact Topics Retained for Further Analysis

---

12 Issues central to the proposal were retained as impact topics for consideration and detailed analysis in  
13 this EA.

### 14 *Vegetation*

15 The NPS policy is to protect the natural abundance and diversity of all naturally occurring communities.  
16 The NPS *Management Policies 2006* (NPS, 2006b), NPS DO #77 “*Natural Resources Management*,”  
17 *Executive Order 13112* “*Safeguarding the Nation from the Impacts of Invasive Species*” and other NPS and  
18 Park policies provide general direction for the protection of vegetation. Replacement and rehabilitation  
19 of the four bridges would require vegetation clearing and ground disturbance for construction access and  
20 staging and laydown areas. Temporary roads would be constructed to gain access to the piers and  
21 abutments for the proposed construction. Additional vegetation clearing would be needed to safely  
22 operate cranes and other equipment. Therefore, *Vegetation* was retained for further analysis in this EA.

### 24 *Hydrology and Water Quality*

25 The NPS policy is to protect water quality. *EO 12088* “*Federal Compliance with Pollution Control*  
26 *Standards*,” NPS *Management Policies 2006* (NPS, 2006b), NPS DO #77 “*Natural Resources*  
27 *Management*,” along with the Clean Water Act and other federal, state, and local regulations, provide  
28 general direction for the protection of surface and groundwaters. The NPS *Management Policies 2006*  
29 state that the NPS would determine the quality of park surface and groundwater resources and avoid,  
30 whenever possible, the pollution of park waters by human activities occurring within and outside the  
31 parks. Replacement/rehabilitation of the bridges all occur over perennial streams. The project would  
32 temporarily impact water quality during in-water construction activities due to pier work and sediment  
33 removal. The project would also have a beneficial impact on the hydraulic opening of the Big Pine Creek  
34 #3 and #6 bridges by removing existing sediment build up currently impeding proper stream flow.  
35 Therefore, *Hydrology and Water Quality* was retained for further analysis in this EA.

### 37 *Wetlands*

38 *EO 11990* “*Protection of Wetlands*,” mandates that each Federal agency take action to minimize the  
39 destruction, loss, or degradation of wetlands and to preserve and enhance their natural values. Section  
40 404 of the Clean Water Act provides general direction for the protection wetlands. NPS DO #77-1  
41 “*Wetland Protection*” defines the NPS goal to maintain and preserve wetland areas. The NPS policy is no-  
42 net-loss of wetlands. Wetlands are defined by the presence of surface and/or groundwater hydrology,  
43 hydric soils (soils that develop under wet conditions), and hydrophytic vegetation (plants that are favored  
44 by wet conditions).

1 A wetland delineation completed in August 2018 found palustrine wetlands to be present within the RSA  
2 of each bridge that would be impacted by the proposed construction. Therefore, *Wetlands* was retained  
3 for further analysis in this EA.

#### 4 ***Rare, Threatened, Endangered, and Special Status Species***

6 In addition to NPS policies and management guidelines, the Endangered Species Act of 1973, as  
7 amended, provides for the protection of rare, threatened, and endangered species (floral and faunal).  
8 Suitable habitat for the NLEB and rusty patched bumble bee (*Bombus affinis*) is located within the RSAs.  
9 The proposed project would require vegetation clearing, which could potentially impact these species. A  
10 Protected Bat Survey was completed as a part of this project (ESI, 2018). A Biological Assessment (BA)  
11 was also completed for all federally listed species (JMT, 2018). No individual NLEB, maternity roost tree,  
12 or hibernacula were identified within the RSA. In addition, no individual rusty patched bumble bees were  
13 identified. Detailed tree and vegetation surveys were performed for the four bridges (JMT, 2018). No  
14 federally listed species were identified, but several plant species with state status and rankings were  
15 identified during the survey within the proposed LOD. In addition, each project stream is classified as  
16 Trout Waters by NCDEQ. Special consideration for construction in Trout Waters would need to be  
17 considered during construction. Therefore, *Rare, Threatened, Endangered, and Special Status Species* was  
18 retained for further analysis in this EA.

#### 19 ***Cultural Resources***

21 The National Historic Preservation Act (NHPA) (16 USC 470 et seq.), NEPA, NPS Organic Act, the NPS  
22 *Management Policies 2006* (NPS, 2006b), *DO #12: Conservation Planning, Environmental Impact Analysis*  
23 *and Decision-making*, and *DO #28: Cultural Resources Management Guideline* require the consideration  
24 of impacts on any cultural resources that might be affected. The NHPA, in particular, requires the  
25 consideration of impacts on cultural resources either listed in, or eligible to be listed in, the National  
26 Register of Historic Places (NRHP). Cultural resources include archeological resources, cultural  
27 landscapes, historic structures and districts, ethnographic resources, and museum collections  
28 (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history  
29 specimens). The *NPS Management Policies* requires that “pending planning decisions, all cultural  
30 resources will be protected and preserved in their existing conditions.” Decisions about them should take  
31 into consideration long term preservation goals and the interests and concerns of traditionally associated  
32 groups.

34 The BLRI is classified as a cultural landscape due to the historic design that reflects the engineering,  
35 landscaping, and architecture of the time-period (NPS, 2013). The Advisory Board on National Parks,  
36 Historic Sites, Buildings, and Monuments declared in 1936, “It is well to bear in mind the saying: ‘Better  
37 preserve than repair, better repair than restore, better restore than [re]construct.’” Today, internationally  
38 accepted historic preservation standards continue to stress the protection and perpetuation of authentic  
39 surviving resources.

41 The four bridges are contributing resources to the proposed BLRI Historic District NHL nomination  
42 currently under development by NPS. The project proposes bridge replacement/rehabilitation along the  
43 existing BLRI alignment that, to the extent practicable, maintains the historic character of the bridges.  
44 The replacement/rehabilitation of the four bridges would result in an adverse effect to cultural resources  
45 associated with the BLRI.

1 *Historic Structures*

2 A historic structure is defined by the NPS as “a constructed work, usually immovable by nature or design,  
3 consciously created to serve some human act” (DO #28:113). For a structure or building to be listed on  
4 or eligible for listing in the NRHP, it must possess historic integrity of those features necessary to convey  
5 its significance, particularly with respect to location, setting, design, feeling, association, workmanship,  
6 and materials. The BLRI was determined eligible for listing in the NRHP in 1990 (NC0001/BN0905) and  
7 is under the management of the NPS. The bridges and additional character defining features such as  
8 masonry drainage channels, parapet guard-walls, rock embankments, and free-standing guard walls are  
9 contributing resources to the proposed BLRI Historic District NHL nomination currently under  
10 development by NPS. Therefore, *Historic Structures* was retained for further analysis in this EA.

11  
12 *Visitor Use*

13  
14 Each of the four bridges was deemed structurally deficient with deteriorating decks and substandard  
15 height bridge rails (FHWA, 2016 and FHWA, 2017). As a result of the substandard height, the existing  
16 rails do not meet current crash standards. NPS proposes to reconstruct the bridges to bring them to  
17 current standards, including a crashworthy rail. Each bridge would be replaced/rehabilitated on its  
18 existing alignment.

19  
20 NPS DO #12 “*Conservation Planning, Environmental, Impact Analysis, and Decision-Making*,” requires  
21 the consideration of impacts on visitor use and experience that might be affected. Enjoyment of park  
22 resources and values by the people of the United States is part of the fundamental purpose of all parks  
23 (NPS, 2006a). The NPS strives to provide opportunities for forms of enjoyment that are uniquely suited  
24 and appropriate to the natural and cultural resources found in parks. There would be minor, temporary  
25 visual impacts from vegetation clearing during construction. However, re-vegetation would be proposed  
26 in the disturbed areas for each of the RSAs. A segment of the Mountains to Sea Trail is located within the  
27 RSA for the Laurel Fork Bridge. This trail would need to be either temporarily closed or temporarily  
28 rerouted during construction.

29  
30 A temporary detour route off the BLRI would be needed for visitors and BLRI users for the duration of  
31 the proposed construction of each bridge. The detour routes would redirect the traffic around the  
32 construction onto nearby public roads. During the time of detour, there would be temporary impacts to  
33 the park’s concession operations and campgrounds located within the limits of the detour. Therefore,  
34 *Transportation and Visitor Use* was retained for further analysis in this EA.

35  
36 **Issues and Impact Topics Dismissed from Further Analysis**

---

37 The following impact topics were initially considered but were dismissed from further analysis because  
38 the resource is not present in the project site, or because the proposed project would have no impact,  
39 have a negligible impact, or have a minor impact. A brief rationale for the dismissal of each impact topic  
40 is provided below.

41  
42 *Soils*

43  
44 Any soil disturbance, grading, and digging would be kept to a minimum. Only clean fill would be used if  
45 needed. No contaminated soils were identified on site at any of the RSAs. Farmland soils of statewide and  
46 local importance, regulated under the Farmland Protection Policy Act, were identified within the RSAs  
47 for Big Pine Creek Bridge #3, Brush Creek Bridge #1, and the Laurel Fork Bridge; however, the project  
48 would not irreversibly convert farmland at any of the four bridges. No prime farmlands soils were

1 identified within the RSA for either of the four bridges. Approximately 0.2 acres of farmland of statewide  
2 importance occur with the LOD for Big Pine Creek #3. This impact would be considered negligible.  
3 Approximately 2.3 acres of farmland of statewide importance and approximately 2.4 acres farmland of  
4 local importance occur with the Laurel Fork Bridge RSA. Permanent soil disturbance for the Laurel Fork  
5 Bridge would be limited to the construction of the piers and abutments. This disturbance would not  
6 irreversibly convert farmland within the RSA and would comply with the Farmland Protection Policy  
7 Act. Therefore, *Soils* was dismissed as an impact topic for further analysis in this EA.

### 8 9 ***Wildlife and Wildlife Habitat***

10 The NPS policy is to protect the natural abundance and diversity of all wildlife and wildlife habitats. The  
11 NPS *Management Policies 2006* (NPS, 2006b), NPS DO #77 “*Natural Resources Management*” and other  
12 NPS and Park policies provide general direction for wildlife management. The RSAs for each bridge are  
13 located in undeveloped, forested areas. The areas surrounding the bridges include a complex of mature,  
14 upland forests; floodplain forests; riparian, forested wetlands; and in-stream aquatic communities. These  
15 communities support a variety of diverse wildlife, which remain mostly undisturbed. Construction  
16 related activities at all four of the bridges would temporarily displace wildlife and temporarily impact  
17 wildlife habitat. The proposed project has the potential to adversely impact wildlife and wildlife habitat  
18 during construction. However, these impacts would be minimized by re-grading to pre-existing  
19 conditions and re-establishing the vegetation in the disturbed areas for each of the RSAs, which would  
20 promote the growth of native and desirable species. Therefore, *Wildlife and Wildlife Habitat* was  
21 dismissed for further analysis in this EA.

### 22 23 ***Archeological Resources***

24 The NPS defines an archeological resource as any material remains or physical evidence of past human  
25 life or activities that are of archeological interest, including the record of the effects of human activities  
26 on the environment. Archeological resources are capable of revealing scientific or humanistic  
27 information through archeological research (DO #28:67). Prior to the current study, no formal  
28 archeological inventory has taken place in the APEs (Area of Potential Effects) for either of the four  
29 bridges. Ground-disturbing activities during construction/reconstruction of the bridges has the potential  
30 to impact archeological resources located in the APE. To determine the presence or absence of  
31 archeological resources, a Phase I archeological investigation was completed in September-October  
32 2018, which found no sites within the LOD that are potentially eligible for the NRHP. In association with  
33 the Phase I survey, an Archaeological Resource Protection Act of 1979 permit application was filed and  
34 accepted by the NPS in August 2018. Therefore, *Archeological Resources* was dismissed for further  
35 analysis in this EA.

### 36 37 ***Cultural Landscapes***

38 As described in DO #28, a cultural landscape is “a geographic area, including both cultural and natural  
39 resources and the wildlife or domestic animals therein, associated with a historic event, activity, or  
40 person, or exhibiting other cultural or aesthetic values” (DO #28, #87). Cultural landscapes are expressed  
41 in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the  
42 types of structures that are built. The BLRI is part of a documented cultural landscape in the NPS Cultural  
43 Landscape Inventory. The cultural landscape of the BLRI would only be temporarily impacted during  
44 the period of construction. Therefore, *Cultural Landscapes* was dismissed for further analysis in this EA.

1 ***Ethnographic Resources***

2 Ethnographic resources are any “site, structure, objects, landscape, or natural resource feature assigned  
3 traditional legendary, religious, subsistence, or other significance in the cultural system of a group  
4 traditionally associated with it” (*DO #28: Cultural Resource Management Guideline*.) Starting from the  
5 present and going back in time for the continuity of at least two generations, ethnographic resources are  
6 identified with peoples, tribes, or groups, including families and communities, traditionally associated  
7 with the BLRI. The BLRI currently has a draft ethnographic overview and assessment that lists over 95  
8 sites along the BLRI corridor as possible ethnographic resources.

9  
10 There are no parkway-wide ethnographic resources currently identified in the RSAs (NPS 2013). Within  
11 the specific stretch of BLRI that contains the bridge projects, only the Brinegar Cabin Complex at  
12 Doughton Park is considered an ethnographic resource (NPS, 2013). This will not be impacted by the  
13 proposed projects.

14 Agricultural leases and easements, that enable to the continued practice of traditional lifeways, are a  
15 unique kind of ethnographic resource. Through these leases and easements, ties with particular local  
16 families have created a legacy of shared work towards a common goal that resonates not only with the  
17 original landscape design of the BLRI, but also with the agrarian ideals of many local people. At the same  
18 time, agricultural leases and easements are clearly important both to the BLRI and to the leaseholders  
19 who, in many cases, have maintained them for generations. Moreover, many current leases and  
20 easements were held as private agricultural land by ancestors of current leaseholders prior to the  
21 establishment of the BLRI and continue to have meaning to those local families as part of their traditional  
22 way of life. Thus, many of these agricultural leases and easements might be considered “ethnographic  
23 landscapes” that the BLRI and local people have worked to create and perpetuate for the last 75 years.

24  
25 A permanent agricultural access road easement is located beneath the Laurel Fork Bridge. A farmer and  
26 his extended family utilize this road to obtain access to the farm parcel, which is landlocked. NPS has  
27 coordinated with the farmer and his extended family. The access road would only be temporarily  
28 impacted during the period of construction. This access road would be used during construction  
29 activities; however, it would be restored to pre-construction conditions once construction is complete.  
30 Therefore, *Ethnographic Resources*, was dismissed for further analysis in this EA.

31  
32 ***Air Quality***

33  
34 The 1963 Clean Air Act, as amended (42 United States Code [USC] 7401 et seq.), requires federal land  
35 managers to protect air quality in national parks. Alleghany and Ashe Counties are not located in the  
36 nonattainment zone for ozone or for particulate matter (2.5 microns or less), nor are the counties located  
37 in maintenance areas. Dust and vehicle emissions related to construction activities and transport of  
38 construction materials and personnel may temporarily affect local air quality. Air drainage would rapidly  
39 dissipate hydrocarbons, nitrogen oxide, and sulfur dioxide emissions, because air stagnation is  
40 uncommon at the project site. Overall, there would be a slight and temporary degradation of local air  
41 quality as a result of dust generated from construction activities, but these effects would be localized and  
42 negligible. The proposed project would not adversely affect the BLRI’s current level of air quality and  
43 would comply with the Clean Air Act. Therefore, *Air Quality* was dismissed from further analysis.

1 ***Soundscapes***  
2

3 The Noise Control Act of 1972 (42 U.S.C. 4901) found “that inadequately controlled noise presents a  
4 growing danger to the health and welfare of the Nation’s population, particularly in urban areas; that the  
5 major sources of noise include transportation vehicles and equipment, machinery, appliances, and other  
6 products in commerce; and that, while primary responsibility for control of noise rests with state and  
7 local governments, federal action is essential to deal with major noise sources in commerce control of  
8 which require national uniformity of treatment.” The Noise Control Act of 1972 was amended by the  
9 Quiet Communities Act of 1978 (42 U.S.C. 4913) to promote the development of effective state and local  
10 noise control programs, to provide funds for noise research, and to produce and disseminate educational  
11 materials to the public on the harmful effects of noise and ways to effectively control it. In addition, NPS  
12 DO #47 “*Soundscape Preservation and Noise Management*” requires an analysis of impacts from noise in  
13 the affected area.  
14

15 The project is not expected to result in increased traffic along the BLRI, and construction of the bridges  
16 is expected to result in a negligible, temporary increase in noise. The predominant land use within the  
17 vicinity of the project area is forested. The proposed project would not change the long-term noise  
18 environment although there would be minor, short term impacts during construction. The proposed  
19 project would comply with the Noise Control Act. Therefore, *Noise* was dismissed from further analysis.  
20

21 ***Floodplains***  
22

23 EO 11988 “*Floodplain Management*,” and NPS DO #77-2 “*Floodplain Management*,” require an  
24 examination of impacts to floodplains and potential risk involved in placing facilities within floodplains  
25 (NPS, 2003). The RSAs for each bridge are not located within the 100-year floodplain or floodway, as  
26 defined by the Federal Emergency Management Agency (FEMA) (FEMA, 2009a,b,c,d). Therefore,  
27 impacts on floodplains would not occur and a Statement of Findings is not required. *Floodplains* was,  
28 therefore, dismissed from further analysis.  
29

30 ***Visual Resources***

31 The conservation of scenery is established in the NPS Organic Act and is reaffirmed by the General  
32 Authorities Act, as amended, Management Policies 2006 (section 1.4.6 and 4.0) and more specifically  
33 articulated for the BLRI in the enabling legislation (PL 848, June 30, 1936) and its legislative history.  
34 Scenery is considered to be a “core value” of the BLRI based upon an analysis of the BLRI’s legislative  
35 history and by the definition of what a parkway is as a national park system unit (NPS, 2013).  
36

37 The BLRI is a linear park following the crest of the Blue Ridge Mountains and is known for its scenic  
38 variety. The views and vistas along the BLRI have become a destination for travelers. In addition to the  
39 long roadway corridor landscape, there are 15 recreation areas along the BLRI. Replacement and  
40 rehabilitation of the bridges, which were deemed structurally deficient, would allow for the continued  
41 use of the BLRI and increase its longevity. Impacts to visual resources would be considered minor since  
42 reconstruction of the bridges would occur on the existing alignment. There would be minor, short term  
43 impacts due to clearing for construction. *Visual Resources* was, therefore, dismissed from further analysis.

44 ***Socioeconomics***  
45

46 NPS DO #2 “*Park System Planning*” and DO #12 “*Conservation Planning, Environmental, Impact Analysis,*  
47 *and Decision-Making*” require an analysis of impacts on the human environment, which includes

1 economic, social, and demographic elements in the affected area. The BLRI is used primarily for  
2 recreation and is located entirely on existing NPS land. The construction of the bridges would not affect  
3 the surrounding community’s overall population, income, and employment base. There would be a  
4 temporary, positive impact from jobs associated with construction. *Socioeconomics* was, therefore,  
5 dismissed from further analysis.

### 6 *Night Skies Initiative*

7  
8  
9 The NPS’ night skies initiatives aim to “enhance qualities of solitude and undeveloped wilderness  
10 character that animals depend on for survival, park visitors seek for connections, and many cultural-  
11 historical parks require for preservation” (NPS, 2018a). This project would have a negligible influence on  
12 existing levels of light pollution as no installation of permanent light sources would occur. *Night Skies*  
13 *Initiative* was, therefore, dismissed from further analysis.

## 14 **CHAPTER 2 – DESCRIPTION OF ALTERNATIVES AND MITIGATION**

---

16 NEPA requires that federal agencies conduct a careful, complete, and analytical study of the impacts  
17 resulting from proposals that have the potential to affect the environment and to consider alternatives to  
18 those proposals, well before any decision is made. The two alternatives are to continue current  
19 management (the No Action Alternative) and the Proposed Action Alternative. This chapter also includes  
20 mitigation measures, which would be implemented under the Proposed Action Alternative.

### 21 **ALTERNATIVE 1: NO ACTION**

---

22 Under the No Action Alternative, NPS and FHWA would not replace or rehabilitate the four bridges.  
23 Each of the four bridges was deemed structurally deficient with deteriorating decks and substandard  
24 height bridge rails. As a result of the substandard height, the existing rails do not meet current crash  
25 standards. No substantial improvements would be performed other than routine maintenance  
26 operations. Continued use of the current bridges would require increased monitoring and maintenance.  
27 Emergency repairs would likely be necessary, particularly as the bridges continue to structurally degrade.  
28 Delayed replacement and continued use would risk bridge failure with programmed funds unavailable to  
29 construct new bridges. Ultimately, the bridges would need to be closed and visitors detoured off the  
30 BLRI. This could result in a five to six-year closure of the BLRI (NPS, USDOJ and FHWA, USDOT, 2017).  
31 The Laurel Fork Bridge closes, and would continue to close, when wind speed exceeds 60 miles per hour.  
32 This wind restriction was implemented in February 2017. Analysis of the No Action Alternative is  
33 required as part of the NEPA process in order to provide a basis for the comparison of other feasible  
34 alternatives.

### 35 **ALTERNATIVE 2: PROPOSED ACTION – REPLACE/REHABILITATE BRIDGES ON EXISTING** 36 **ALIGNMENT**

---

37 Each bridge would be replaced/rehabilitated on its existing alignment to preserve the historic BLRI  
38 alignment, roadway features, and adjacent natural areas. All bridges would be replaced/rehabilitated to  
39 bring them to current standards, including a crashworthy rail. The Laurel Fork Bridge would be a  
40 complete replacement. The other three bridges would have deck replacements in combination with  
41 retaining existing abutments and select piers to maintain historic aesthetics. The projects would include  
42 detour options for the duration of construction. All work is expected to take place within the existing

1 NPS right-of-way and construction access, although the detours would extend onto public roads outside  
2 the park boundaries.

3  
4 BLRI Project 2A16: Big Pine Creek Bridges #3 and #6, Brush Creek Bridge #1

5 The preliminary design recommendations are to replace the concrete bridge deck on all three of the  
6 bridges along with the bridge railings. The proposed design would emulate the original rustic style. The  
7 existing stone abutments on the three bridges would be partially preserved along with the existing pier  
8 for Brush Creek Bridge #1. The existing, original stone would be reused to the extent practicable on all  
9 three of the bridges. In order to increase the hydrologic opening of Big Pine Creek Bridge #3, the design  
10 team would change the bridge from a three-span structure to a two-span structure. This change would  
11 require removal of the two existing piers and replacement with a single pier. Stone from piers at Big Pine  
12 Creek #3 and #6 designated for replacement would be salvaged and used as stone facing for the new piers,  
13 to the extent practicable. The RSAs and LODs for these bridges are shown on Figures 2A, 2B, and 2C and  
14 are as follows:

- 15
- 16 • Big Pine Creek Bridge #3 – RSA approximately 1.9 acres; LOD approximately 0.6 acres
- 17 • Big Pine Creek Bridge #6 – RSA approximately 2.1 acres; LOD approximately 0.8 acres
- 18 • Brush Creek Bridge #1 – RSA approximately 2.3 acres; LOD approximately 0.8 acres
- 19

20 BLRI Project 2D17: Laurel Fork Bridge

21  
22 This project consists of removing and replacing the Laurel Fork Bridge. The alignment and type of the  
23 proposed bridge were evaluated at the Value Analysis (VA), held in November 2017, and determined  
24 during the NEPA/NHPA process. The Laurel Fork Bridge would be replaced along the existing  
25 alignment. The new piers would be designed and constructed in the same architectural style with similar  
26 materials and color. Stone veneer from the existing abutments would be removed and used to create a  
27 similar stone veneer for the new abutments, ditch, and stonewall to the extent practicable. Otherwise,  
28 new Elberton granite veneer would be used on the abutments, parapets, guardwalls, and paved waterways  
29 to replicate the current veneer as closely as possible. The RSA for this bridge is shown on Figure 2D and  
30 is approximately 18.0 acres. The LOD is approximately 5.6 acres.

31  
32 Proposed construction activities for each bridge is as follows:

- 33
- 34 • Big Pine Creek Bridge #3, Structure 5140-077P
  - 35 ○ Replacement of the bridge along its current alignment.
  - 36 ○ Superstructure (deck and rails) of the bridge would be replaced.
  - 37 ○ A new asphalt surface course will be installed on the new concrete bridge deck.
  - 38 ○ Design would emulate the original rustic style.
  - 39 ○ New abutments would be constructed behind the existing abutments for structural
  - 40 stability; existing stone masonry abutments would be partially preserved, and existing
  - 41 stone veneer would be repointed.
  - 42 ○ Both existing bridge piers would be removed, and a new pier would be constructed in the
  - 43 middle of the bridge. Stone from piers designated for replacement would be salvaged and
  - 44 used as stone facing for the new pier to the extent practicable.
  - 45 ○ Existing, original stone would be reused to the extent practicable for the new abutments
  - 46 and piers.

- Existing wood rails and concrete posts would be replaced with timber guardrails and brown steel I-beam posts to replicate the existing rails as closely as crashworthy design would allow.
- No realignment alternatives or changes to bridge geometry are proposed.

- Big Pine Creek Bridge #6, Structure 5140-080P

- Replacement of the bridge along its current alignment.
- Superstructure (deck and rails) of the bridge would be replaced.
- A new asphalt surface course will be installed on the new concrete bridge deck.
- Design would emulate the original rustic style.
- New abutments would be constructed behind the existing abutments for structural stability; existing stone masonry abutments would be partially preserved, and existing stone veneer would be repointed.
- Stone from piers designated for replacement would be salvaged and used as stone facing for the new pier to the extent practicable. The new pier would be placed in the same location as existing pier.
- Existing, original stone would be reused to the extent practicable for the new abutments and piers.
- Existing wood rails and concrete posts would be replaced with timber guardrails and brown steel I-beam posts to replicate the existing rails as closely as crashworthy design would allow.
- No realignment alternatives or changes to bridge geometry are proposed.

- Brush Creek Bridge #1, Structure 5140-081P

- Replacement of the bridge along its current alignment.
- Superstructure (deck and rails) of the bridge would be replaced.
- A new asphalt surface course will be installed on the new concrete bridge deck.
- Design would emulate the original rustic style.
- New abutments would be constructed behind the existing abutments for structural stability; existing stone masonry abutments would be partially preserved, and existing stone veneer would be repointed. Existing, original stone would be reused to the extent practicable.
- Existing pier would be cut shorter and kept in place for aesthetics; it would no longer be a structural element. Riprap would be installed to prevent scour and to protect the structural integrity of the bridge including the historic pier.
- Existing wood rails and concrete posts would be replaced with timber guardrails and brown steel I-beam posts to replicate the existing rails as closely as crashworthy design would allow.
- No realignment alternatives or substantial changes to bridge geometry have been proposed.
- Design would incorporate a wildlife crossing under the bridge along the left bank.

- Laurel Fork Bridge, Structure 5140-159P

- Complete replacement of the bridge on the existing alignment.
- A new asphalt surface course will be installed on the new concrete bridge deck.
- Design of the new piers would replicate the existing design as closely as possible.
- Existing stone-lined ditches would be replicated as closely as possible.

- 1           ○ The stone veneer from the existing abutments would be removed and used to create a
- 2           similar stone veneer for the new abutments, stonewalls, and ditches to the extent
- 3           practicable. Any new stone needed for construction of abutments or guard walls would
- 4           be Elberton granite. Any extra stone would be stockpiled for use in future BLRI masonry
- 5           projects.
- 6           ○ Existing concrete rails would be replaced to replicate the existing rails as closely as
- 7           crashworthy design would allow.
- 8           ○ Existing stone walls along the bridge approaches would be replicated as closely as
- 9           possible.

## 11 **Staging and Construction Access**

---

12 Once construction begins, equipment and materials would need to be stored near the project site for the  
13 duration of the project. At each of the bridges, locations have been identified as potential staging areas  
14 that would be suitable for storing materials and equipment while also limiting impacts to the surrounding  
15 area. These areas are generally flat and would allow for machinery to reach the abutments and piers. For  
16 the 2D17 bridge, a nearby paved overlook and the BLRI would be used as a staging area since the road  
17 would be closed. For the 2A16 bridges, the BLRI would be used as a staging area since the road would be  
18 closed. Some tree removal would be required. Any cleared areas would be re-vegetated. Cranes would  
19 be needed for the installation of the bridges. Some tree pruning would be necessary to create adequate  
20 space for crane operations.

21 **Big Pine Creek Bridge #3:** Construction access is proposed along the left bank, upstream of the bridge  
22 and on the right bank. Access on the right bank presents options both upstream and downstream of the  
23 bridge. Diversion berms are proposed to allow room to repaint abutment or other work. Diversions  
24 would take place in two stages. A temporary bridge may be needed depending on construction  
25 sequencing. Construction access may change within the LOD limits based on contractor needs.

27 **Big Pine Creek Bridge #6:** Construction access is proposed upstream of the bridge on both sides of the  
28 stream. Diversion berms are proposed to allow room to repaint abutment or other work. Diversions  
29 would take place in two stages. A temporary bridge may be needed depending on construction  
30 sequencing. Construction access may change within the LOD limits based on contractor needs.

32 **Brush Creek Bridge #1:** Construction access is proposed upstream of the bridge on both sides of the  
33 stream. Construction access on the downstream right bank is proposed to go behind a cluster of  
34 rhododendrons to preserve the aesthetically pleasing plants and visually screen the temporary access  
35 road. Diversion berms are proposed to allow room to repaint abutment or other work. Diversions would  
36 take place in two stages. A temporary bridge is not anticipated for construction activities at this bridge  
37 due to high costs. Construction access may change within the LOD limits based on contractor needs.

39 **Laurel Fork Bridge:** Construction access is proposed around the bridge. Two access options have been  
40 proposed. The eastern access route would approach the existing bridge from the southeast and utilize an  
41 existing permanent agriculture access road in conjunction with the construction of a temporary road and  
42 bridge to cross Cranberry Creek. The western access route would approach the existing bridge from the  
43 northwest and include an access road, however, the exact location of this road is not yet known. Limited  
44 grading of the existing hillslope would be required to the extent practicable to construct the access road  
45 for the western option. Both options would require staging areas surrounding the bridge. Construction  
46 access may change within the LOD limits based on contractor needs and design refinements.

## 1 Mitigation Measures

---

2 Avoidance, minimization, and mitigation measures and Best Management Practices (BMPs) would  
3 prevent or minimize potential adverse effects associated with the implementation of the proposed action.  
4 These measures and practices would be incorporated into the project design and construction plans.

- 5 • Hazardous waste would not be generated from normal construction activities. All hazardous  
6 materials would be stored in appropriate and clearly marked containers away from other non-  
7 waste materials. Prior to beginning work, the contractor will be required to submit a Spill  
8 Prevention, Control, and Countermeasure Plan as required by the Federal Water Pollution  
9 Control Act (Clean Water Act) 33 USC § 1251 et seq. If a Spill Prevention, Control, and  
10 Countermeasure Plan is not required, the contractor will submit a hazardous spill plan describing  
11 preventative measures including the location of refueling and storage facilities and the handling  
12 of hazardous material. The plan will describe action to be taken in case of a spill. Further, the  
13 contractor will be prohibited from using equipment with leaking fluids and will be required to  
14 repair equipment fluid leaks immediately. The contractor will be required to keep absorbent  
15 material manufactured for containment and cleanup of hazardous material on the job site and to  
16 notify the Contracting Officer of hazardous spills immediately.  
17
- 18 • Any soil excavated during construction would be stockpiled and reused as fill, if needed, in  
19 accordance with the Erosion and Sediment Control (E&SC) Plan. Stockpiled topsoil stripped  
20 from the construction area would be stored in an area that would not interfere with construction  
21 phases. Stockpiled soil would be covered with plastic or surrounded with silt fence as outlined in  
22 contract language mitigations. Should additional soil be needed, the soils would be clean, weed-  
23 free soils from an NPS approved source. NPS resource staff shall be notified if fill is required and  
24 when source of fill is determined. Notification shall be given, and two weeks' time allowed for  
25 inspection of fill source site. If fill is not approved, an alternative fill source shall be located, and  
26 an additional two weeks' notice given for new inspection to take place.  
27
- 28 • Surveys for significantly large trees, and uncommon, rare, and aesthetically pleasing plant species  
29 were conducted within the LOD to identify, confirm, and delineate occurrences and preserve  
30 them to the maximum extent practicable. Clearing would incorporate the removal of unhealthy  
31 or invasive tree species where feasible and the retention of native trees. Re-vegetation would be  
32 proposed in the disturbed areas for each of the RSAs, which would promote the growth of native  
33 and desirable species and prevention of colonization of invasive species.  
34
- 35 • To prevent the further spread of non-native plants, control measures include ensuring  
36 construction and maintenance-related equipment arrives onsite free of mud or seed-bearing  
37 material; limiting vehicle parking to existing roadways, designated staging areas, or access routes;  
38 using only seeds certified as weed-free, identifying areas of noxious weeds preconstruction and  
39 re-vegetating with appropriate native and/or non-invasive species immediately following  
40 construction.  
41
- 42 • Specific measures for construction access routes will be included in the project Plans,  
43 Specifications and Estimates. The Plans, Specifications and Estimates will include alignments,  
44 clearing limits, grading (if appropriate), drainage (if appropriate), erosion control, revegetation  
45 and any other information necessary for construction of the access routes.

- 1 • A moratorium prohibiting in-stream work and land disturbance at the Laurel Fork Bridge within  
2 the 25-foot trout buffer is recommended by NCWRC from October 15 to April 15 to protect the  
3 egg and fry stages of trout. Significant trout resources are not expected at the 2A16 bridges;  
4 therefore, NCWRC did not request a trout moratorium. However, NCWRC suggested that  
5 stringent E&SC measures and standard recommendations should apply.  
6
- 7 • An E&SC Plan would be prepared and implemented, consistent with NCDEMLR's most recent  
8 version NC Erosion and Sediment Control Planning and Design Manual. An approved E&SC  
9 Plan would be obtained if the proposed disturbance is equal to or greater than one acre for each  
10 bridge project: 2A16 and 2D17. After the state approves the E&SC Plan, the project will have  
11 coverage under a NPDES Stormwater General Permit NCG010000 Stormwater Pollution  
12 Prevention Plan (SWPPP) for construction-related activities. Due to protected aquatic species in  
13 Cranberry Creek (2D17) and that Cranberry flows to an Outstanding Resource Waters (ORW),  
14 NCWRC recommends that the Laurel Fork Bridge E&SC measures should adhere to the Design  
15 Standards in Sensitive Watersheds (15A NCAC 02H .1021). No construction vehicles would drive  
16 across flowing waterways. Stormwater would be directed to vegetated buffer areas and would not  
17 be discharged directly into surface waters. Big Pine Creek and Brush Creek (2A16) do not flow to  
18 ORW or are within one mile of High Quality Waters; therefore, E&SC measures are not required  
19 to adhere to Design Standards in Sensitive Watersheds.  
20
- 21 • Temporary BMPs would be utilized to minimize erosion and sedimentation from ground  
22 disturbing activities that expose bare soil, which would otherwise negatively impact water quality.  
23 The BMPs may include the use of silt fence, fiber roll, sediment traps, erosion matting, turbidity  
24 curtain, etc. These BMPs would be used only during construction and would be removed once  
25 the disturbed area has been permanently stabilized. Soil erosion would also be minimized by  
26 limiting the time that soil is left exposed. No construction vehicles would access the downslope  
27 side of perimeter control measures or track sediment outside of the project limits.  
28
- 29 • Impacts to Waters of the U.S. (WOUS), including wetlands, would require a permit in accordance  
30 with Section 404 of the Clean Water Act administered by USACE and a Section 401 Water Quality  
31 Certification from the NCDEQ. The NPS follows a no-net-loss of wetlands policy found in *DO*  
32 *#77-1 "Wetland Protection"*, Procedural Manual #77-1 (NPS, 2016b), and *NPS Management*  
33 *Policies* (NPS, 2006b). Consistent with these guidelines, only mitigation banks on NPS lands can  
34 be used to satisfy wetland compensation requirements if mitigation is required. After  
35 construction, wetland areas used for access would be re-graded to pre-existing conditions and re-  
36 vegetated with native wetland species  
37
- 38 • Tree removal would be minimized wherever possible. FHWA and NPS would not allow tree  
39 removal during the active bat season (April 1 to November 1) to reduce the chance of the  
40 impacting unidentified bat maternity roosts. The NPS would install two pole mounted (12-feet to  
41 20-feet in height), multi-chamber bat boxes near the Laurel Fork Bridge prior to demolition  
42 specifically for little brown bats (*Myotis lucifugus*); however, other bat species would benefit from  
43 these boxes. Boxes would be placed as much as possible in the open and away from  
44 trees. Construction activities would occur during daylight hours. Mitigation measures for impact  
45 to rusty patched bumble bee habitat would include re-vegetating some areas of the disturbed areas  
46 with native wildflowers.

- 1 • Due to the historical significance of the existing stone-faced abutments and piers, NPS proposes  
2 to reuse the existing stone masonry to the maximum extent possible, leaving as many existing  
3 elements in place as possible. Additionally, each bridge would be reconstructed on its existing  
4 alignment to preserve the historic BLRI alignment, roadway features, and adjacent natural areas.  
5
- 6 • Due to the total replacement of the Laurel Fork Bridge and the replacement of the superstructure  
7 on the three remaining bridges, this project would have an Adverse Effect on the bridges as  
8 contributing resources to the National Register of Historic Places (NRHP)-eligible BLRI Historic  
9 District. A MOA was developed in consultation with NPS, FHWA, NCSHPO, and THPOs and  
10 executed on May 30, 2019. The following tribes were asked to be signatories to the MOA –  
11 Shawnee Tribe, Catawba Indian Nation, Absentee Shawnee Tribe of Indians of Oklahoma,  
12 United Keetoowah Band of Cherokee Indians in Oklahoma, Cherokee Nation, and Eastern Band  
13 of Cherokee Indians. After the MOA was finalized, FHWA contacted the tribes and requested  
14 their signature on the MOA. All signatures were obtained except for the Absentee Shawnee Tribe  
15 of Indians of Oklahoma, United Keetoowah Band of Cherokee Indians in Oklahoma, and  
16 Cherokee Nation. After consulting with the SHPO and ACHP, FHWA considers any adverse  
17 effects to be resolved. Stipulations related to inadvertent discoveries during construction are  
18 included.  
19
- 20 • If archeological resources are discovered during construction, the NPS would halt all work in the  
21 immediate vicinity of the discovery until the resources can be identified and documented, and an  
22 appropriate mitigation strategy developed. If necessary, NPS staff would consult with the  
23 NCSHPO, THPOs, and/or the NPS regional archeologist to ensure that the protection of  
24 resources is addressed. In the unlikely event that human remains, funerary objects, sacred objects,  
25 or objects of cultural patrimony are discovered during construction, the National Park Service  
26 would follow provisions outlined in the Native American Graves Protection and Repatriation Act  
27 (25 USC 3001) of 1990.  
28
- 29 • NPS would implement BLRI -wide or site-specific traffic control plans, as warranted, during  
30 construction. Standard measures would include strategies to maintain safe and efficient traffic  
31 flow. Project sequencing and road closures would be planned to minimize impacts to BLRI  
32 visitors, concession operations, and neighboring communities.  
33
- 34 • Use of the landowner easement and permanent access road under the Laurel Fork Bridge would  
35 be needed for construction. Appropriate landowner coordination is currently being conducted.  
36 The access road would be returned to preexisting conditions after construction activities are  
37 complete.  
38
- 39 • A portion of the Mountains to Sea Trail passes through the RSA. Mountains to Sea Trail is a formal  
40 NPS partner. Coordination regarding closure and/or rerouting of the trail will continue  
41 throughout the entire design process.  
42
- 43 • Guardrail and guard walls will be designed in accordance with “Roadside Barrier Warranting and  
44 Assessment of Adverse Effects Screening Methodology” approved as part of the *Guardrail  
45 Replacement and Installation Programmatic Environmental Assessment, Appendix B, Roadside  
46 Cultural Resources Preservation: A guide to Assessing the Effects of Roadside Safety Implementation*

1 on the Blue Ridge Parkway (2009) and subsequent Finding of No Significant Impact (FONSI)  
2 signed 10/2010.

### 3 ALTERNATIVES CONSIDERED BUT DISMISSED

---

4 CEQ regulations for implementing NEPA require federal agencies to explore and objectively evaluate all  
5 reasonable alternatives and to briefly discuss the rationale for eliminating any alternatives that were not  
6 discussed in detail. FHWA and NPS have conducted extensive analysis and preliminary engineering  
7 related to the replacement/rehabilitation of each bridge.

8  
9 2A16 - Alternatives considered but dismissed for the 2A16 bridges include:

- 10
- 11 1) Full replacement on new alignment
- 12 2) Full replacement on existing alignment
- 13

14 These alternatives were dismissed because they would have additional permanent, adverse impacts to the  
15 historic alignment of the BLRI as well as the surrounding natural resources. Coordination with the  
16 NCSHPO concluded that replacing these bridges on their existing alignment retains the original historic  
17 alignment, abutments, and piers; therefore, the other alternatives were dismissed. In order to preserve  
18 the existing historic nature of the 2A16 bridges, rehabilitation of the existing bridge with historic elements  
19 along the existing alignment was retained. In addition, replacing the bridges on the existing alignment  
20 reduces impacts to natural resources as there would be minimal new footprint and minimal approach  
21 work needed.

22  
23 2D17 - Alternatives considered but dismissed for the 2D17 bridge includes:

- 24
- 25 1) Rehabilitate the existing bridge – The concrete piers are currently structurally deficient, ASR are  
26 evident, and compressive strength is too low. The 1985 rehabilitation actions have reached end of  
27 life, and there is limited ability to extend the life cycle of the current structure.
- 28
- 29 2) Replace the bridge piers only and retain superstructure – The superstructure has a remaining life  
30 of only about 30 years, and maintenance is presently needed on the steel structure. Existing  
31 railings are not crash-worthy and would need to be replaced. Continued use would retain use of  
32 a fracture-critical, non-redundant bridge structure. The cost would not be substantially less than  
33 full replacement, with approximately \$13 million for piers, joints, and railings, and an estimated  
34 life cycle cost of \$19.7 million. Replacement piers would constrain future superstructure  
35 replacement options.
- 36
- 37 3) Full replacement on new alignment.
- 38

39 A further analysis was done to identify the bridge alignment and bridge type for construction. A *Value*  
40 *Analysis (VA) and Choosing-by-Advantages (CBA) Study* was prepared for the replacement of the Laurel  
41 Fork Bridge in December 2017. The study identified three bridge alignments and three bridge types  
42 considered for the bridge replacement.

1 The three bridge replacement alignment alternatives included:

- 2 • Maintain existing alignment
- 3 • New alignment north of existing bridge
- 4 • New alignment south of existing bridge

5  
6 The three bridge types considered included:

- 7 • Concrete segmental bridge
- 8 • Steel plate girder bridge
- 9 • Concrete bulb-tee bridge

10  
11 After a full evaluation of factors for the bridge alignment, such as health, safety, and welfare of employees  
12 and the public; natural resources; cultural resources; visitor experience; and operations and maintenance  
13 efficiency, the study recommended maintaining the existing alignment. This alignment would also save  
14 approximately \$1 million.

15  
16 After a full evaluation of factors for the bridge type, such as park operations and maintenance; cultural  
17 resources; visitor experience; constructability; and natural resources, the VA study recommended the  
18 concrete segmental bridge. The construction cost for this bridge would be \$500,000 more than the steel  
19 girder bridge; however, this bridge would have the lowest life cycle cost.

20 In addition, two railing designs were evaluated that meet crash test standards and meet cultural  
21 compliance and aesthetic criteria. The Kansas Coral railing system and the Caltrans Type 80 railing were  
22 considered by the VA team. Handrails would not be installed if pedestrian access is not provided on the  
23 replacement bridge. The Kansas Corral railing was dismissed during the Creativity Phase of the VA;  
24 therefore, the Caltrans Type 80 is the recommended bridge railing.

## 25 26 **CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL** 27 **CONSEQUENCES**

---

28 This chapter describes the existing environmental conditions in and around the RSAs and the  
29 environmental consequences associated with the alternatives presented in Chapter 2: Alternatives.  
30 Chapter 3 is organized by impact topic and includes the impact topics presented in Chapter 1: Need that  
31 required further analysis: Vegetation; Hydrology and Water Quality; Wetlands; Rare, Threatened,  
32 Endangered Species, and Special Status Species; Historic Structures; and Transportation and Visitor Use.

33  
34 For each impact topic identified in Chapter 2, the impact analysis includes a description of the direct and  
35 indirect impacts (both adverse and beneficial) and a discussion of the importance of the impacts in  
36 consideration of the resource context and the intensity of the impact. The impact analysis is based on  
37 input from an interdisciplinary team with knowledge of the resources and experience implementing  
38 similar projects.

## 39 **CUMULATIVE IMPACTS**

---

40 The CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-  
41 making process for federal projects. Cumulative impacts are defined as:

1 The impact on the environment which results from the incremental impact of the action when added  
2 to other past, present, and reasonably foreseeable future actions regardless of what agency (federal  
3 or non-federal) or person undertakes such other actions (40 CFR Part 1508.7).

4  
5 As stated in the CEQ handbook, *Considering Cumulative Effects under the National Environmental Policy*  
6 *Act* (CEQ, 1997), cumulative impacts must be analyzed in terms of the specific resource, ecosystem, or  
7 human community being affected and should focus on effects that are truly meaningful.

8  
9 Cumulative impacts can result from individually minor, but collectively moderate, or major actions taking  
10 place over a period of time. Cumulative impacts are evaluated in a regional context, which varies for each  
11 impact topic; however, in general, the regional context is the BLRI. A cumulative impact analysis was  
12 completed for the No Action and Proposed Action Alternatives. Past, present, and future actions that  
13 would impact each resource were investigated. The BLRI as a whole is aging and many  
14 repairs/replacements would be needed for historic bridges and other structures as they are approaching  
15 the end of their service lives. There are numerous planned improvements including current and future  
16 bridge and roadway projects.

## 17 VEGETATION

---

### 18 Affected Environment

---

19 The vegetation within all four bridge RSAs includes a complex of upland, floodplain forests, and riparian  
20 forested wetland communities. The area within the RSAs is undeveloped. A detailed tree and vegetation  
21 survey of all strata: canopy, subcanopy, shrub, herb, and vine was conducted in August 2018 to classify  
22 vegetation communities and identify significantly large trees, common, uncommon, rare, and  
23 aesthetically pleasing plant species in each of the RSAs (JMT, 2018). Significantly large trees were  
24 determined by NPS and FHWA intend to minimize visual and environmental impacts to the extent  
25 practicable by incorporating data about the existing vegetation into the design of the proposed  
26 construction access areas. To the maximum extent practicable, the project would impact as few large  
27 trees as possible and preserve aesthetically pleasing native vegetation to help conceal temporary road  
28 impacts. Large trees designated as significant exceeded the typical size ranges of the particular species  
29 listed on North Carolina State University’s Plant Extension website (NCSU, 2018). The Data collected  
30 during this survey was used to quantify impacts from proposed construction.

31  
32 Vegetation communities were mapped within each of the RSAs, several of which are considered rare  
33 communities (NCNHP, 2011 for State Rank and NCNHP, 2012 for Global Rank). Tables 2 and 3 list the  
34 natural communities mapped.

35  
36 **Table 1: Mapped Vegetation Communities at Big Pine Creek Bridge #3, Big Pine Creek Bridge #6,**  
37 **and Brush Creek Bridge #1**

Vegetation Community Name	State Rarity Rank	Global Rarity Ranking
Montane Alluvial Forest (Small River Subtype)	None	G3
Acidic Cove Forest (Typic Subtype)	S5	G5
Swamp Forest – Bog Complex (Typic Subtype)	S3	G2
Maintained/disturbed areas	None	None

1 **Table 2: Mapped Vegetation Communities at Laurel Fork Bridge**

Vegetation Community Name	State Rarity Rank	Global Rarity Ranking
Montane Alluvial Forest (Small River Subtype)	None	G3
Acidic Cove Forest (Typic Subtype)	S5	G5
Rich Cove Forest (Montane Intermediate Subtype)	S4	G4
Montane Oak-Hickory Forest (White Pine Subtype)	S5	G2G3
Maintained/disturbed areas	None	None

2 State Rank:

3 S3 = Rare or uncommon in North Carolina

4 S4 = Apparently secure in the state, with many occurrences.

5 S5 = Demonstrable secure in the state

6 Global Rank:

7 G2 = Imperiled globally because of rarity or because of some factor making it vulnerable to degradation or destruction.

8 G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to degradation or destruction.

9 G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

10 G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

11  
12  
13  
14 Within the Montane Alluvial Forest community of the Laurel Fork Bridge RSA, two areas of the  
15 Cranberry Creek floodplain were identified as former pasture/hayfield. These areas are not currently  
16 used for agricultural purposes; however, they were historically used for livestock grazing and have since  
17 naturalized.

18  
19 In addition, the North Carolina Natural Heritage Program (NCNHP) has designated Significant Natural  
20 Heritage Areas within the RSA of Big Pine Creek Bridge #3 and Brush Creek Bridge #1. The NCNHP  
21 maintains the state’s primary database of geographic information for rare species (both plant and animal),  
22 as well as for exemplary natural community types and Significant Natural Heritage Areas. Significant  
23 areas contain good to excellent examples of natural communities, and rare plant and animal populations  
24 (NCNHP, 2011). A portion of the Big Pine Creek Wetlands Significant Natural Heritage Area is located  
25 within the RSA for Big Pine Creek Bridge #3 and a portion of the Skunk Cabbage Significant Natural  
26 Heritage areas is located with the RSA for Brush Creek Bridge #1.

27  
28 The vegetation survey also identified the following uncommon, rare, and aesthetically pleasing species  
29 within each RSA. Rare plants are addressed below in the Rare, Threatened, and Endangered Species  
30 subsection. Aesthetically pleasing plants were identified in as shrub/understory patches of native  
31 vegetation along the BLRI to help conceal temporary road impacts. The aesthetically pleasing species  
32 found within each RSA include: flame azalea (*Rhododendron calendulaceum*), great rhododendron  
33 (*Rhododendron maximum*), mountain laurel (*Kalmia latifolia*), American witch-hazel (*Hamamelis*  
34 *virginiana*), beaked hazelnut (*Corylus cornuta*), mountain sweet pepperbush (*Clethra acuminata*),  
35 American holly (*Ilex opaca*), common chinquapin (*Castanea pumila*), fraser magnolia (*Magnolia fraseri*),  
36 mapleleaf viburnum (*Viburnum acerifolium*), rock chestnut oak (*Quercus montana*), southern sheepskill  
37 (*Kalmia Carolina*), eastern hemlock (*Tsuga canadensis*), eastern hawthorn (*Crataegus macrosperma*),  
38 hearts-a-bustin’ (*Euonymus americanus*), flowering dogwood (*Cornus florida*), hobblebush (*Viburnum*  
39 *lantanoides*), and northern wild raisin (*Viburnum cassinoides*).

40 Identified vegetation included both native and introduced trees, shrubs, vines, and herbaceous species.  
41 The non-native plants species that are considered a threat to native plant communities of the BLRI  
42 include, Chinese privet (*Ligustrum sinense*), Chinese lespedeza (*Lespedeza cuneata*), Japanese stiltgrass  
43 (*Microstegium vimineum*), multiflora rose (*Rosa multiflora*), and oriental bittersweet (*Celastrus*

1 *orbiculatus*) (NCDOT, 2012). Several other non-native species were identified; however, these species  
2 were not as dominant or threatening.

3  
4 Detailed information regarding the methodology and the full list of all species found during the survey  
5 can be found in the *Tree and Vegetation Survey Report; Blue Ridge Parkway 2A16 and 2D17 Project –*  
6 *Alleghany and Ashe Counties, North Carolina* (JMT, 2018).

## 7 **Environmental Consequences**

---

### 8 **No Action Alternative**

#### 9 *Direct and Indirect Impacts*

10 The No Action Alternative would have no impact on vegetation since there would be no construction.  
11 The NPS would continue management actions that would include minimum roadway maintenance.  
12 Except for hazardous tree removal (e.g. trees about to fall onto the roadway) and occasional trimming of  
13 tree branches that overhang the roadway and pose a potential safety hazard to motorists if they were to  
14 fall, natural vegetation in the RSAs would remain undisturbed.

#### 16 **Conclusion**

17 There would be no direct, indirect, or cumulative impacts to vegetation under the No Action Alternative,  
18 because vegetation would not be removed or damaged to the extent that their survivability would be  
19 jeopardized.

### 21 **Proposed Action Alternative**

#### 22 *Direct and Indirect Impacts*

23 Construction activities would result in minor, adverse impacts to vegetation. The bridge  
24 replacement/rehabilitation projects would require vegetation clearing and ground disturbance.  
25 Temporary roads would be constructed to gain access to the piers and abutments. Additional vegetation  
26 clearance would be needed to safely operate cranes and other equipment. Trees to be removed would  
27 include those located in the proposed LOD. The construction access areas would avoid native trees to  
28 the extent practicable. Unhealthy or non-native tree species would be slated for removal wherever  
29 feasible. All construction equipment would remain within the LOD for construction, limiting the  
30 potential vegetation impacts in the RSA.

31  
32 Approximately 0.4 acres (out of the total 1.9-acre RSA) of vegetation clearing would be necessary for Big  
33 Pine Creek Bridge #3 (approximately 30 trees with 3in Diameter at Breast Height (DBH) or greater); 0.5  
34 acres (out of the total 2.1-acre RSA) for Big Pine Creek Bridge #6 (approximately 40 trees with 3in DBH  
35 or greater); and 0.7 acres (out of the total 2.3-acre RSA) for Brush Creek Bridge #1 (approximately 72  
36 trees with 3in DBH or greater). Construction access for the Laurel Fork Bridge has not been determined.  
37 The maximum amount of clearing would be approximately 4.6 acres (out of the total 18-acre RSA)  
38 (approximately 460 trees with 3in DBH or greater). This area includes the west construction access  
39 option. The east construction access option would be 3.6 acres (approximately 410 trees with 3in DBH  
40 or greater). It is anticipated that only one access option will be chosen, and vegetation clearing would be  
41 kept to the minimum needed. Areas identified for access and staging will not be clear-cut in their entirety.  
42 Contractors would be allowed design access and staging within the designated LOD, but vegetation  
43 would be preserved within those areas to maximum extent practicable. The vegetation survey identified  
44 areas that are more sparsely vegetated and/or contain extensive exotic species, or otherwise less valuable  
45 vegetation. The project would impact as few large trees as possible and preserve aesthetically pleasing  
46 patches of native shrubs/sub-canopy species to help conceal temporary impacts from construction  
47 activities.

1 Table 3 lists the vegetation communities impacted by vegetation clearing. Only one of the communities,  
 2 Swamp Forest – Bog Complex (Typic Subtype) is listed as rare or uncommon in North Carolina.  
 3 Temporary impacts to this rare/uncommon community are 0.02 acres.  
 4

5 **Table 3: Vegetation Community Impacts**

Vegetation Community Name	Area within LOD (acres)
<i>Big Pine Creek Bridge #3</i>	
Montane Alluvial Forest (Small River Subtype)	0.17
Acidic Cove Forest (Typic Subtype)	0.07
<i>Big Pine Creek Bridge #6</i>	
Montane Alluvial Forest (Small River Subtype)	0.29
Acidic Cove Forest (Typic Subtype)	0.07
Swamp Forest – Bog Complex (Typic Subtype)	0.02
<i>Brush Creek Bridge #1</i>	
Montane Alluvial Forest (Small River Subtype)	0.29
Acidic Cove Forest (Typic Subtype)	0.07
<i>Laurel Fork Bridge</i>	
Montane Alluvial Forest (Small River Subtype)	1.57
Acidic Cove Forest (Typic Subtype)	1.78
Rich Cove Forest (Montane Intermediate Subtype)	1.32
Montane Oak-Hickory Forest (White Pine Subtype)	0.11

6  
 7 Construction activities within the Big Pine Creek Bridge #3 RSA would result in approximately 0.01 acres  
 8 of permanent impact and 0.04 acres of temporary impact to NCNHP’s designated Big Pine Creek  
 9 Wetlands Significant Natural Heritage Area. Construction activities within the Brush Creek Bridge #1  
 10 RSA would result in approximately 0.23 acres of permanent impact and 0.76 acres of temporary impact  
 11 to NCNHP’s designated Skunk Cabbage Significant Natural Heritage Area. In addition, construction  
 12 activities within the Brush Creek Bridge #1 RSA would result in approximately 0.04 acres of permanent  
 13 impact and 0.17 acres of temporary impact to NCNHP’s designated NEW/Little River Aquatic Habitat.  
 14 These instream impacts are a result of permanent riprap placement below the ordinary high-water mark.  
 15 Coordination with NCNHP would be necessary during the permitting process regarding impacts to the  
 16 Significant Natural Heritage Areas.  
 17

18 Indirect impacts from clearing would be temporary and may occur from damage to the trees caused by  
 19 machinery and mat placements. Machinery movement and temporary construction mats would cause  
 20 root stress and tree injuries to species not cleared, which could result in possible death. The construction  
 21 activities would likely impact only a small number of individual plants and would not impact any  
 22 populations of species. Once the construction is complete, adjacent areas within the LOD would be  
 23 reseeded or replanted with native and/or non-invasive species, paying particular attention to replanting  
 24 the appropriate species within rare vegetation communities. Construction activities in areas of natural  
 25 vegetation would have longer term, temporary impacts on canopy species from the loss of trees within  
 26 the LOD. It is anticipated that it would take approximately 20 years for a mature canopy to reestablish in  
 27 the disturbed areas.  
 28

29 **Conclusion**

30 Construction of the Proposed Action Alternative would result in temporary, adverse impacts on  
 31 vegetation as a result of the clearing and removal of currently undisturbed areas for construction  
 32 activities. Tree removal would be minimized wherever possible. Only 0.02 acres of rare/uncommon  
 33 vegetation community will be temporarily impacted as this area would be re-vegetated with appropriate

1 native and/or non-invasive species immediately following construction. Other communities impacted are  
2 ranked as secure in North Carolina and are common communities along the BLRI.

3  
4 Ground disturbance has the potential to result in the introduction of exotic and invasive herbaceous  
5 plant species that could outcompete native vegetation. The project would incorporate invasive species  
6 prevention and long-term monitoring which would be specifically described in project construction  
7 mitigation plans. Invasive species long-term monitoring will likely fall under the general BLRI invasive  
8 species monitoring and management protocols. Mitigation measures would include:

- 9
- 10 • removal of unhealthy or invasive tree species where feasible and the retention of highly desirable  
11 native trees
- 12 • re-vegetation would be proposed in the disturbed areas for each of the RSAs, which would  
13 promote the growth of native and desirable species
- 14

15 Additional mitigation measures that would be implemented to reduce invasive species introduction  
16 include:

- 17
- 18 • ensuring construction and maintenance-related equipment arrives onsite free of mud or seed-  
19 bearing material
- 20 • limiting vehicle parking to existing roadways, parking lots, or access routes
- 21 • using only seeds and straw material certified as weed-free
- 22 • identifying areas of noxious weeds preconstruction and re-vegetate with appropriate native  
23 and/or non-invasive species immediately following construction
- 24

25 These measures would be specified to the contractor in the contract documents. If possible, work in  
26 sensitive areas would be performed during the winter months to minimize the likelihood of herbaceous  
27 exotic and invasive species establishment. Long term invasive species monitoring would adhere to the  
28 general BLRI invasive species monitoring and management protocols. The proposed project would  
29 comply with *EO 13112 "Safeguarding the Nation from the Impacts of Invasive Species."*

30  
31 **Cumulative Impacts:** Past bridge and roadway improvement projects along the BLRI have resulted in  
32 minor long-term adverse impacts to vegetation from construction-related disturbances. Current and  
33 future improvement projects would also result in minor long-term adverse impacts to vegetation from  
34 land clearing necessary to construct the new facilities. The 2A16 and 2D17 projects require vegetation  
35 disturbance that would be noticeable, but only a small percentage of existing forested area in the context  
36 of the BLRI. Mitigation measures such as re-vegetating and re-grading disturbed areas within the RSAs  
37 would ultimately result in a minor adverse impact to vegetation. Overall, the Proposed Action Alternative  
38 would contribute a minor increment to the adverse cumulative impact of other projects and actions to  
39 vegetation. The cumulative impact would be minor.

## 40 HYDROLOGY AND WATER QUALITY

---

### 41 Affected Environment

---

42 The RSAs are located within the New River Basin, which is thought to be one of the oldest rivers in the  
43 world. In 1998 it was named an American Heritage River by former President Clinton. The lower South  
44 Fork New River and the North Carolina portion of the New River (26 miles) were also designated as

1 National Scenic Rivers. That 26-mile stretch is classified by NCDEQ as ORW because of its recreational  
2 and ecological importance and excellent water quality.

3  
4 Within the RSA for Big Pine Creek Bridge #3 and #6, Big Pine Creek flows under the existing bridges. Big  
5 Pine Creek Bridge #3 and #6 RSAs each included a smaller tributary draining to Big Pine Creek. Within  
6 the RSA for Brush Creek Bridge #1, Brush Creek flows under the existing bridge. No other tributaries  
7 were identified. Within the RSA for Laurel Fork Bridge, Cranberry Creek flows under the existing bridge.  
8 Two additional tributaries were identified draining to Cranberry Creek within the RSA. Big Pine Creek  
9 and Brush Creek are located within the USGS New River Basin 8-digit Hydrologic Unit Code (HUC)  
10 0505001 and the Brush Creek Watershed 12-digit HUC 050500010405. Cranberry Creek is located within  
11 the USGS New River Basin 8-digit HUC 0505001 and the Cranberry Creek Watershed 12-digit HUC  
12 050500010208. The New River Basin is not subject to Riparian Buffer Rules regulated by NCDEQ.

13  
14 The NCDEQ identified Big Pine Creek and Brush Creek as Class C; Trout Waters (C;Tr) and Cranberry  
15 Creek as Class B; Trout Waters (B;Tr:+) (NCDWR, 2014b). Class C waters are protected for uses such as  
16 secondary recreation, fishing, wildlife, fish consumption, aquatic life including propagation, survival and  
17 maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and  
18 other uses involving human body contact with water where such activities take place in an infrequent,  
19 unorganized, or incidental manner. Class B are waters protected for all Class C uses in addition to primary  
20 recreation. Primary recreational activities include swimming, skin diving, water skiing, and similar uses  
21 involving human body contact with water where such activities take place in an organized manner or on  
22 a frequent basis. Trout waters designation is a supplemental classification intended to protect freshwaters  
23 which have conditions which sustain and allow for trout propagation and survival of stocked trout on a  
24 year-round basis. The “+” symbol identifies waters that are subject to a special management strategy  
25 specified in 15A NCAC 2B .0225 the ORW rule, in order to protect downstream waters designated as  
26 ORW. Cranberry Creek flows to the South Fork of the New River, which is classified as an ORW.

27  
28 Big Pine Creek, Brush Creek, and Cranberry Creek are not listed on the NCDEQ Final 2016 303(d) list  
29 (NCDEQ, 2018a) for impaired waters. According to the NCDWR 2014 integrated report, Big Pine Creek  
30 met criteria for benthos with a “good” classification in 2009 and exceeded the criteria for fish tissue  
31 mercury in 2012 (NCDWR, 2014a). Big Pine Creek was briefly listed on the 303(d) in 2008 but has since  
32 been delisted. Brush Creek met criteria for benthos with a “good” classification in 2007, met criteria for  
33 fish community with a “good” classification in 2008, and exceeded criteria for fish tissue mercury in 2012.  
34 Brush Creek was briefly listed as 303(d) in 2008 but has since been delisted. Cranberry Creek met criteria  
35 for benthos with an “excellent” classification in 2008, met criteria for fish community with a “good”  
36 classification in 2008, and exceeded criteria for fish tissue mercury in 2012. Cranberry Creek was briefly  
37 listed as 303(d) in 2008 but has since been delisted.

38  
39 Bioclassifications of “Excellent,” “Good,” “Good-Fair,” “Fair,” or “Poor” are used to describe benthic  
40 and fish stream samples and incorporates information from the sample such as species richness and  
41 composition, pollution indicator, condition, and abundance. The score is used to determine the  
42 biological integrity class of the stream from which the sample was collected. If a fish community is rated  
43 excellent, good, or good-fair it is deemed to be fully supporting its aquatic life use support stream  
44 classification (NCDWR, 2013; NCDWR, 2016).

## 1 Environmental Consequences

---

### 2 No Action Alternative

#### 3 *Direct and Indirect Impacts*

4 The No Action Alternative would have a negative impact on hydrology and water quality as the bridges  
5 would continue to degrade, erode, and eventually fail. Sediment would also continue to accumulate  
6 under the bridge openings and compromise the hydraulic opening. Eventually the bridges would not be  
7 able to accommodate stream flow especially during storm events. Natural erosion of the stream banks  
8 would continue to occur.

#### 10 *Conclusion*

11 There would be no direct, indirect, or cumulative impacts to hydrology and water quality under the No  
12 Action Alternative, because there would be no construction.

### 14 Proposed Action Alternative

#### 15 *Direct and Indirect Impacts*

16 Construction activities for each bridge site would result in minor, adverse impacts to hydrology and water  
17 quality. No roadway expansion or additional roadway surface is proposed as part of these projects.  
18 Approximately 0.71 acres of total land disturbance is proposed for the three 2A16 bridges. Land  
19 disturbance has not been finalized for Laurel Fork Bridge; however, over one acre of disturbance would  
20 be anticipated. Land disturbance during construction would cause the potential for sediment to enter the  
21 receiving streams and ultimately travel downstream to the New River. BMPs would be installed to reduce  
22 the potential for erosion and sedimentation in accordance with the NCDEQ approved E&SC Plan. Since  
23 the BLRI would be closed due to the construction, the roadway would be used for staging areas.

24  
25 During construction, direct impacts from stormwater runoff are local, short term, and temporary as flow  
26 would be directed into erosion control structures and vegetated buffers and would not discharge directly  
27 into surface waters., Also, no additional permanent impervious surface would result from the proposed  
28 project as the bridges would be replaced/rehabilitated of similar size. Construction road surfaces would  
29 be temporary and BMPs would control and treat the runoff from those surfaces. At Brush Creek Bridge  
30 #1, the existing pier would be cut shorter and kept in place for aesthetics; it would no longer be a  
31 structural element. Permanent riprap would be installed in the channel around the base of the pier and  
32 abutments to protect those structures by preventing scour and erosion typically associated with bridge  
33 failure. Preventing scour and failure would prevent significant erosion and the discharge of sediment  
34 laden stormwater as well as preventing other bridge and roadway construction materials in the water.  
35 Placement of riprap would be considered a permanent impact as it would constrict the channel and  
36 increase stream flow velocity.

37  
38 Indirect impacts from the riprap placement at Brush Creek Bridge #1 would include minor bank erosion  
39 and instability directly downstream of the bridge. Bank erosion would lead to an increase in sediment  
40 transport. This indirect impact would be considered minor since the overall hydraulic opening of the  
41 bridge is large enough to allow for storm flow during rain events and riprap placement would not  
42 compromise the hydraulic opening designed for the bridge. Over time, debris would accumulate around  
43 the bridge as it would get caught on the riprap during storm events; however, this would be alleviated by  
44 routine maintenance. For the other three bridges, indirect impacts to hydrology are not anticipated,  
45 because the project design does not affect the stream flow or increase stormwater. Indirect impacts to  
46 water quality would be temporary and may include additional sediment input from erosion into the  
47 streams until the replanted vegetation becomes established, and as a result, the soil stabilizes. Additional  
48 sediment input would jeopardize the survival of fish, macrobenthos, and other aquatic life.

1 Construction activities that disturb one acre or more of land require an E&SC Plan that has been  
2 approved by the state. After the state approves the E&SC Plan, the project will have coverage under  
3 a NPDES Stormwater General Permit NCG010000 Stormwater Pollution Prevention Plan (SWPPP) for  
4 construction-related activities, provided that the ground stabilization and basin design requirements in  
5 the stormwater permit are included in the E&SC Plan. Specific measures for construction access routes  
6 will be included in the project Plans, Specifications and Estimates. The Plans, Specifications and  
7 Estimates will include alignments, clearing limits, grading (if appropriate), drainage (if appropriate),  
8 erosion control, revegetation and any other information necessary for construction of the access routes.

9 An E&SC Plan would be prepared and implemented, consistent with NCDEMLR's most recent version  
10 of the NC Erosion and Sediment Control Planning and Design Manual for each bridge project. An  
11 approved E&SC Plan would be needed at each bridge location if land disturbance is anticipated to be  
12 greater than one acre. If the disturbance is less than one acre, an E&SC plan and appropriate BMPs would  
13 be included with each bridge. If the west access option is chosen for construction access to the Laurel  
14 Fork Bridge, additional clearing and re-grading the forested slope in the northwest quadrant would be  
15 needed. Cranberry Creek flows into the South Fork New River, which is designated as an ORW. This  
16 designation falls under the 15A NCAC 02H .1201 guidelines which requires 30-foot vegetated setbacks  
17 in addition to the required E&SC Plan. NCWRC also recommends that the Laurel Fork Bridge sediment  
18 and erosion control measures should adhere to the Design Standards in Sensitive Watersheds (NCWRC  
19 Correspondence, September 10, 2018, Appendix B). Big Pine Creek and Brush Creek do not flow to ORW  
20 or are within one mile of High Quality Waters; therefore, E&SC measures are not required to adhere to  
21 Design Standards in Sensitive Watersheds. There are no local erosion and sediment control programs in  
22 Alleghany and Ashe Counties, and therefore, the NCDEQ would review and approve the plan.

23  
24 The project would also have a beneficial impact on the hydraulic opening of Big Pine Creek Bridge #3  
25 and #6 by removing existing sediment accumulations currently impeding proper stream flow. This  
26 sediment has accumulated under the bridges and is compromising the hydraulic opening designed for  
27 the bridge. This constriction impedes the proper movement of water during storm events and creates  
28 back water. The sediment area has been delineated and would be removed as part of construction. BMPs  
29 would be implemented during removal of the sediment to minimize the amount of sediment entering the  
30 stream. Currently no significant sediment or debris accumulation exists at Brush Creek Bridge #1 or the  
31 Laurel Fork Bridge. However, if conditions change and sediment accumulates, sediment removal at these  
32 bridges would be included as a part of this project.

### 33 34 ***Conclusion***

35 Construction of the Proposed Action Alternative would result in both adverse and beneficial impacts to  
36 hydrology and water quality. Permanent, adverse impacts would result from the placement of riprap at  
37 Brush Creek Bridge #1. Temporary, adverse impacts would be from soil disturbed during construction  
38 at all four bridge locations, making the particles highly mobile and easily transported by erosional forces.  
39 Permanent, beneficial impacts include increasing the hydraulic opening of Big Pine Creek Bridge #3 and  
40 #6 by removing existing sediment accumulations currently impeding proper stream flow and removing a  
41 pier at Big Pine Creek Bridge #3. The pier would be removed to improve the hydraulic conditions of the  
42 bridge and more closely recreate the natural hydrology of Big Pine Creek.

43 Both permanent and temporary direct, adverse impacts are considered minor as they are localized to the  
44 bridge. Any suspended particles would likely drop from the water flow near or around the bridge.  
45 Downstream impacts are not anticipated.

1 Mitigation measures would include the use of temporary BMPs to minimize erosion and sedimentation  
2 from ground disturbing activities that expose bare soil, which would otherwise negatively impact water  
3 quality. The BMPs may include the use of silt fence, fiber roll, sediment traps, erosion matting, turbidity  
4 curtain, etc. These BMPs would be used only during construction and would be removed once the  
5 disturbed area has been permanently stabilized. Soil erosion would also be minimized by limiting the time  
6 that soil is left exposed. No construction vehicles would access the downslope side of perimeter control  
7 measures or track sediment outside of the project limits. Disturbed soil would be re-vegetated using  
8 specific seed mixes that do not include invasive or exotic species. Areas used for construction access  
9 would be re-graded to pre-existing conditions and re-vegetated with native and/or non-invasive species.  
10 An E&SC Plan would be prepared for all bridges. The project would comply with EO 12088, Sections 402  
11 and 404 of the Clean Water Act, NPS DO #77, and NC Sediment Pollution Control Act.

12  
13 **Cumulative Impacts:** Past bridge and roadway improvement projects along the BLRI have resulted in  
14 minor long-term adverse impacts to hydrology and water quality from construction-related  
15 disturbances. Current and future improvement projects would also result in minor long-term adverse  
16 impacts to hydrology and water quality from land clearing necessary to construct the new facilities. The  
17 2A16 and 2D17 projects require land and stream disturbance that would be noticeable, but only a small  
18 percentage of existing area in the context of the BLRI. Mitigation measures such as BMPs and re-  
19 vegetating and re-grading disturbed areas within the RSAs would mitigate impacts and as a result the  
20 project result in a minor adverse impact to hydrology and water quality. Overall, the Proposed Action  
21 Alternative would contribute a minor increment to the adverse cumulative impact of other projects and  
22 actions to hydrology and water quality since no roadway expansion or additional road surface is  
23 proposed. The cumulative impact would be minor.

## 24 WETLANDS

---

### 25 Affected Environment

---

26 Field investigations were conducted to delineate potentially jurisdictional WOUS, including wetlands, in  
27 August 2018 for each of the bridge RSAs. The delineations were performed according to the USACE  
28 *Wetland Delineation Manual, Technical Report Y-87-1* (Environmental Laboratory, 1987), the *Regional*  
29 *Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont*  
30 *Regional Supplement, Version 2.0* (USACE, 2012), and NCDEQ NC state code G.S. 143-212(6). Wetland  
31 delineations conducted on the projects also satisfied NPS DO #77-1 “*Wetland Protection, Procedural*  
32 *Manual #77-1* (NPS, 2016b), and *NPS Management Policies* (NPS, 2006b). A Preliminary Jurisdictional  
33 Determination by the USACE is currently being requested for the delineations at each bridge.

34  
35 North Carolina Wetland Assessment Method (NCWAM) forms and North Carolina Stream Assessment  
36 Method (NCSAM) forms were completed for all wetlands and WOUS found within each RSA (JMT,  
37 2018). These forms determine the level of wetland and a stream function for each potentially  
38 jurisdictional feature identified. This process generates a function rating for each feature assessed.

39  
40 Tables 4 through 7 include a summary of the results at each RSA. Detailed information regarding the  
41 delineation can be found in *Waters of the U.S., Including wetlands, Delineation and Functional Assessment*  
42 *Report; Blue Ridge Parkway 2A16 and 2D17 Project – Alleghany and Ashe Counties, North Carolina* (JMT,  
43 2018).

1

Table 4: Summary of Potential WOUS and Wetlands in the Big Pine Creek Bridge #3 RSA

HUC Watershed	Wetland Name	Cowardian Classification	NC WAM Classification	NC WAM Overall Rating	Size (Acres)
New River (05050001)	WA	PFO	Bottomland Hardwood Forest	Medium	0.06
	WB	PFO	Bottomland Hardwood Forest	Medium	0.03
	WOUS Name	Stream Classification	NC SAM Category	NC SAM Overall Rating	Length (Linear Feet)
	SA	Perennial (R3)	Mb3	High	370
	SB	Intermittent (R4)	Mb2	High	30

2

3

Table 5: Summary of Potential WOUS and Wetlands in the Big Pine Creek Bridge #6 RSA

HUC Watershed	Wetland Name	Cowardian Classification	NC WAM Classification	NC WAM Overall Rating	Size (Acres)
New River (05050001)	WA	PFO	Bottomland Hardwood Forest	High	0.19
	WB	PFO	Bottomland Hardwood Forest	Medium	0.02
	WOUS Name	Stream Classification	NC SAM Category	NC SAM Overall Rating	Length (Linear Feet)
	SA	Perennial (R3)	Mb3	High	355
	SB	Perennial (R3)	Mb3	High	165

4

5

Table 6: Summary of Potential WOUS and Wetlands in the Brush Creek #1 RSA

HUC Watershed	Wetland Name	Cowardian Classification	NC WAM Classification	NC WAM Overall Rating	Size (Acres)
New River (05050001)	WA	PFO	Bottomland Hardwood Forest	Medium	0.004
	WB	PFO	Bottomland Hardwood Forest	High	0.004
	WC	PFO	Bottomland Hardwood Forest	High	0.13
	WOUS Name	Stream Classification	NC SAM Category	NC SAM Overall Rating	Length (Linear Feet)
	SA	Perennial (R3)	Mb4	High	385

6

Table 7: Summary of Potential WOUS and Wetlands in the Laurel Fork RSA

HUC Watershed	Wetland Name	Cowardian Classification	NC WAM Classification	NC WAM Overall Rating	Size (Acres)
New River (05050001)	WA	PFO	Headwater Forest	Medium	0.07
	WB	PFO	Headwater Forest	High	0.02
	WC	PEM	Non-Tidal Freshwater Marsh	High	0.45
	WD	PFO	Headwater Forest	High	0.04
	WOUS Name	Stream Classification	NC SAM Category	NC SAM Overall Rating	Length (Linear Feet)
	SA	Perennial (R3)	Mb3	High	490
	SB	Perennial (R3)	Mb1	Medium	994
	SC	Perennial (R3)	Mb1	High	220

PFO: Palustrine Forested Wetland; PEM: Palustrine Emergent Wetland; Mb: Mountain – narrow geomorphic valley – watershed size (1: <0.1; 2: 0.1 to <0.5; 3: 0.5 to <5.0; 4: ≥5 square miles)

**Environmental Consequences**

**No Action Alternative**

*Direct and Indirect Impacts*

The No Action Alternative would have no impact on WOUS and wetlands since there would be no construction. However, the bridges would continue to degrade, erode, and eventually fail.

**Conclusion**

There would be no direct, indirect, or cumulative impacts to WOUS and wetlands under the No Action Alternative, because there would be no construction.

**Proposed Action Alternative**

*Direct and Indirect Impacts*

Construction activities at each bridge would result in minor, adverse impacts to WOUS. During construction, each project stream would incur local, short term, temporary impacts due to stream diversions to allow room to repoint abutments and other work. Temporary impacts would also result from the removal of sedimentation from Big Pine Creek Bridge #3 and #6. Proposed activities at Big Pine Creek Bridge #3 would remove both existing piers and construct a new pier in the middle of the structure. The new pier would result in minor permanent loss of in-stream habitat, as the majority of the pier would be constructed outside the jurisdictional stream limits. The removal of the existing pier within the stream would result in a net gain of approximately 35 linear feet/0.002 acres of streambed. Proposed activities at Big Pine Creek Bridge #6 would construct two new piers in the same location as the existing piers. The footprint of the new piers would be the same as the existing piers; however, removal and construction of the piers would result in temporary impacts to the stream. Proposed activities at Brush Creek Bridge #1 would keep the existing pier in place; although, permanent riprap would be proposed around the existing pier as well as both bridge abutments for stability. Temporary impacts to Cranberry Creek would occur for the construction of an access road. Temporary impacts would involve the installation of a temporary crossing structure and/or temporary channel diversion. Construction access details have not been finalized for this bridge. Placement of permanent bridge support structures would likely not impact

1 Cranberry Creek. BMPs would be implemented during these construction activities to minimize the  
 2 amount of sediment entering the stream.

3  
 4 Construction activities at each bridge would result in minor, adverse impacts to wetlands. Temporary  
 5 impacts to wetlands would result from the placement of construction access for each bridge. Impacts  
 6 from construction access consist of clearing, grading, and installing a temporary driving surface.  
 7 However, after construction, areas used for access would be re-graded to pre-existing conditions and re-  
 8 vegetated with native wetland species. Because the replacement/rehabilitation would be on the existing  
 9 alignment and minimal approach work is needed, no permanent impacts to wetlands would be  
 10 anticipated from roadway work.

11  
 12 No indirect impacts to wetlands are anticipated from construction activities. Indirect impacts to WOUS  
 13 from the riprap placement would include bank erosion and instability directly downstream of Brush  
 14 Creek Bridge #1. Riprap would be installed to prevent scour and to protect the structural integrity of the  
 15 bridge including the historic pier; however, riprap placement would constrict flow around the bridge lead  
 16 to an increase in sediment transport. Over time, debris could accumulate around the bridge as it could  
 17 get caught on the riprap during storm events although routine maintenance should clear the debris. In  
 18 the long term, preventing scour and failure would prevent significant erosion and the discharge of  
 19 sediment laden stormwater as well as preventing other bridge and roadway construction materials in the  
 20 water. Additional indirect impacts include instream sediment input from slope erosion until the  
 21 replanted vegetation becomes established and the soil stabilizes.

22 A summary of proposed temporary and permanent impacts to WOUS and wetlands are included below  
 23 in Table 8.

24 **Table 8: Summary of Potential Impacts to WOUS and Wetlands**

Feature Name	Approximate Temporary Impact (Linear Feet/Acre)	Approximate Permanent Impact (Linear Feet/Acre)
<b>Big Pine Creek Bridge #3</b>		
Wetland WA	0.004 AC	None
Wetland WB	0.02 AC	None
Stream SA	175 LF / 0.1 AC	15 LF / 0.001 AC
Stream SB	None	None
<b>Total Wetland</b>	<b>0.024 AC</b>	<b>None</b>
<b>Total Stream</b>	<b>175 LF / 0.1 AC</b>	<b>15 LF / 0.001 AC</b>
<b>Big Pine Creek Bridge #6</b>		
Wetland WA	0.02 AC	None
Wetland WB	0.01 AC	0.01 AC
Stream SA	190 LF / 0.17 AC	None
Stream SB	55 LF / 0.01AC	None
<b>Total Wetland</b>	<b>0.03 AC</b>	<b>0.01 AC</b>
<b>Total Stream</b>	<b>245 LF / 0.18 AC</b>	<b>None</b>

Brush Creek Bridge #1		
Wetland WA	None	None
Wetland WB	None	None
Wetland WC	0.00001 AC	None
Stream SA	150 LF / 0.17 AC	185 LF / 0.04 AC
<b>Total Wetland</b>	<b>0.00001 AC</b>	<b>None</b>
<b>Total Stream</b>	<b>150 LF / 0.17 AC</b>	<b>185 LF / 0.04 AC</b>
Laurel Fork Bridge		
Wetland WA	0.01 AC	--
Wetland WB	None	--
Wetland WC	0.001 AC	--
Wetland WD	None	--
Stream SA	274 LF / 0.1 AC	--
Stream SB	50 LF / 0.01 AC	--
Stream SC	None	--
<b>Total Wetland</b>	<b>0.011 AC</b>	<b>--</b>
<b>Total Stream</b>	<b>325 LF / 0.11 AC</b>	<b>--</b>

Note: Permanent impacts as a result of construction activities at Laurel Fork will be calculated when design is finalized. Permanent impacts would not exceed the amount of reported temporary impacts.

Impacts to wetlands would require a USACE Section 404 permit and a NCDEQ Section 401 Water Quality Certification. The NPS follows the *DO #77-1 "Wetland Protection"*, Procedural Manual #77-1 (NPS, 2016b), and *NPS Management Policies* (NPS, 2006b) for avoiding adverse impacts on wetlands, minimizing unavoidable wetland impacts, and compensating for wetland impacts. All NPS actions with the potential to have adverse impacts on wetlands must comply with DO #77-1 and Procedural Manual #77-1, and those actions that involve placing dredged or fill material in wetlands or other WOUS (as defined in 33 CFR 320-332) must also comply with Section 404 of the Clean Water Act. DO #77-1 states the NPS goal to achieve "no net loss of wetlands" in the course of managing NPS resources and developing park management and visitor use facilities and programs. In addition, the Director's Order establishes a longer-term goal to achieve "net gain" of wetland habitat through efforts to restore natural wetlands that have been degraded or lost due to past human activities. Since impacts (both temporary and permanent) on wetlands for each bridge group (2A16 and 2D17) total less than 0.1 acres, then wetland compensation mitigation would likely not be required. If impacts change and wetland compensation is required, then wetland compensation in the form of restoration of degraded or former wetland habitat is required. Wetland mitigation must be on lands managed by NPS. When compliance with D.O. #77-1 and Section 404 is required, it is important to coordinate with the appropriate USACE office and the NPS Water Resources Division early on to assure that project alternatives and wetland compensation proposals satisfy both processes.

### **Conclusion**

Construction of the Proposed Action Alternative at each bridge would result in temporary and minor permanent, adverse impacts to WOUS and wetlands. To the maximum extent practicable, impacts to WOUS and wetlands were avoided and unavoidable WOUS and wetland impacts were minimized. The

1 presence of WOUS and wetlands factored into the location of the construction access areas to minimize  
2 impacts to those features. Construction methods using mats, low impact equipment, and proper erosion  
3 and sediment control methods would be utilized to minimize impacts. These impacts would be  
4 considered minor and under the threshold of USACE and NPS required compensatory mitigation. The  
5 types of medium to high quality wetlands impacted are common to the BLRI; therefore, they would be  
6 considered a small percentage of impact to the total amount of wetlands in the park. Mitigation measures  
7 include obtaining a Section 404 permit under the Clean Water Act administered by USACE and a Section  
8 401 Water Quality Certification administered by the NCDEQ. The NPS follows a no-net-loss of wetlands  
9 policy found in *DO #77-1 "Wetland Protection"*, Procedural Manual #77-1 (NPS, 2016b), and NPS  
10 *Management Policies* (NPS, 2006b). This guidance requires avoiding, minimizing, and compensating for  
11 adverse impacts on wetlands. The proposed project complies with these guidance documents.

12  
13 A Wetland Statement of Findings is not required for these projects. Exception #8 (Bridge Replacements)  
14 under *Section 4.2.1. Potential Exceptions for Certain "Water Dependent" and Maintenance Activities* of  
15 the *NPS Procedural Manual #77-1: Wetland Protection* (NPS, 2016) allows for up to 0.25 acre of new,  
16 permanent impacts on wetlands. Temporary construction-related impacts on wetlands of 0.25 ace or less  
17 may be allowed if disturbed sites are actively restored to pre-disturbance conditions during, or  
18 immediately after, construction. Each of the four bridge locations, which have independent utility and  
19 are analyzed separately, is below the impact threshold. Section 4.2.2 and Appendix B of the manual  
20 contain fifteen additional conditions that must be met for projects to qualify for an exception. Appendix  
21 B, Condition #15, states that an action must not have an adverse effect on Historic Properties listed or  
22 eligible for listing in the NRHP. Each of the four bridges are contributing resources to the NRHP-eligible  
23 BLRI National Historic District. The construction constitutes and adverse effect to the Historic District;  
24 however, the adverse effects are being mitigated through a MOA between NPS, FHWA, and the North  
25 Carolina SHPO Office. The MOA contains stipulations related to the design that will ensure that impacts  
26 avoided or minimized to the maximum extent practicable. These design criteria include preserving the  
27 existing bridge and parkway alignments, preservation of masonry features where feasible, and use of  
28 replacement features that mimic the rustic character of the existing structures. Archaeological survey was  
29 also conducted, in coordination with six participating Tribal Historic Preservation Offices, to ensure that  
30 any significant sites would be identified. Although no significant sites were found, the MOA contains  
31 stipulations regarding any inadvertent discoveries, including human remains, during construction. This  
32 MOA, and its associated commitments, will mitigate the effects of the project on historic resources,  
33 therefore Condition #15 has been adequately addressed by NPS and FHWA. All of the other conditions  
34 in Appendix B will be met.

35  
36 **Cumulative Impacts:** Past bridge and roadway improvement projects along the BLRI have resulted in  
37 minor long-term adverse impacts to wetlands from construction-related disturbances. Current and  
38 future improvement projects would also result in minor long-term adverse impacts to wetlands from  
39 activities necessary to construct the new facilities. The 2A16 and 2D17 projects require land disturbance  
40 that would be noticeable, but only a small percentage of existing area in the context of the BLRI.  
41 Mitigation measures such as BMPs and re-vegetating and re-grading disturbed areas within the RSAs  
42 would ultimately result in a minor adverse impact to wetlands. Overall, the Proposed Action Alternative  
43 would contribute a minor increment to the adverse cumulative impact of other projects and actions to  
44 wetlands. The cumulative impact would be minor.

1 RARE, THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

2 **Affected Environment**

3 Lists of federally protected species were obtained from the USFWS for Alleghany and Ashe Counties  
 4 (USFWS, 2018a; USFWS, 2018b). These listed species are presented in Tables 9 and 10 below:

5  
 6 **Table 9: USFWS – 2D16: Alleghany County Federally Listed Threatened and Endangered Species**

Common Name	Scientific Name	Federal Status	Record Status	Habitat Present?
Bog turtle	<i>Glyptemys muhlenbergii</i>	Threatened (S/A)	Current	No
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Current	Yes

7  
 8 **Table 10: USFWS – 2D17: Ashe County Federally Listed Threatened and Endangered Species**

Common Name	Scientific Name	Federal Status	Record Status	Habitat Present?
Bog turtle	<i>Glyptemys muhlenbergii</i>	Threatened (S/A)	Historic	No
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	Endangered	Current	No
Gray bat	<i>Myotis grisescens</i>	Endangered	Current	No
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	Current	Yes
Rusty-patched bumble bee	<i>Bombus affinis</i>	Endangered	Historic	Yes
Blue Ridge goldenrod	<i>Solidago spithamea</i>	Threatened	Current	No
Heller's blazing star	<i>Liatris helleri</i>	Threatened	Current	No
Roan mountain bluet	<i>Hedyotis purpurea var. montana</i>	Threatened	Current	No
Spreading avens	<i>Geum radiatum</i>	Endangered	Current	No
Swamp pink	<i>Helonias bullata</i>	Threatened	Current	Yes
Virginia spiraea	<i>Spiraea virginiana</i>	Threatened	Current	Yes
Rock gnome lichen	<i>Gymnoderma lineare</i>	Endangered	Current	No

9  
 10 No critical habitat designations for a federally-listed threatened or endangered species was identified by  
 11 the USFWS in Alleghany and Ashe Counties.

12  
 13 A database query was submitted to NCNHP on July 12, 2018, to determine if federal or state-listed rare,  
 14 threatened, or endangered species are present in any of the four RSAs or within a one-mile buffer.

15  
 16 NCNHP data did not indicate element occurrences of federally or state listed threatened or endangered  
 17 species or critical habitat within the Big Pine Creek Bridge #3, Big Pine Creek Bridge #6, and Laurel Fork  
 18 Bridge RSAs.

19  
 20 NCNHP indicated occurrences of state listed species within the RSA for Brush Creek Bridge #1. No  
 21 federally protected species were identified. The state listed species are below in Table 11.

1 **Table 11: NCNHP – Brush Creek Bridge #1 NCNHP State Listed Species Documented within the**  
 2 **RSA**

Taxonomic Group	Common Name	Scientific Name	State Status	Accuracy
Freshwater Fish	Kanawha darter	<i>Etheostoma kanawhae</i>	Significantly Rare	Medium
Vascular Plant	Cuthbert's turtlehead	<i>Chelone cuthbertii</i>	Special Concern Vulnerable	Medium
Vascular Plant	Robin runaway	<i>Rubus dalibarda</i>	Endangered	Medium
Vascular Plant	Bog fern	<i>Thelypteris simulata</i>	Endangered	Medium

3  
 4 *A Protected Bat Study at the Sites of the Four Bridges Along the Blue Ridge Parkway, Ashe and Alleghany*  
 5 *Counties, North Carolina* (ESI, 2018) was prepared for the federally listed bats that may potentially occur  
 6 within the RSAs as well as other bat species.

7  
 8 Acoustic surveys were completed within each RSA for the proposed bridge replacements/rehabilitation  
 9 following current USFWS guidance. The surveys investigated the presence for the federally listed NLEB  
 10 and gray bat as well as the Indiana bat and Virginia big-eared bat, which are not listed for either Alleghany  
 11 or Ashe County. The surveys were completed from August 5 to 7, 2018, which is within the USFWS  
 12 recommended optimal survey window. The acoustic surveys represent the maximum likelihood of  
 13 species present within each bridge vicinity during the time of survey. Maximum likelihood is a statistical  
 14 tool that is used to evaluate the probability that a species is present at a site. Bridge assessments were used  
 15 to visually confirm the use of the bridge structure itself by bat species. The bridge assessments for Big  
 16 Pine Creek Bridge #3, Big Pine Creek Bridge #6, and Brush Creek Bridge #1 revealed no signs of bat use.  
 17 Species identified at each RSA using both acoustic surveys and bridge assessments include:

- 18
- 19 • Big Pine Creek Bridge #3
  - 20 ○ Big brown bat (*Eptesicus fuscus*)
  - 21 ○ Hoary bat (*Lasiurus cinereus*)
  - 22 ○ Tri-colored bat (*Perimyotis subflavus*)
- 23
- 24 • Big Pine Creek Bridge #6
  - 25 ○ Eastern red bat (*Lasiurus borealis*)
  - 26 ○ Hoary bat
  - 27 ○ Silver-haired bat (*Lasionycteris noctivagans*)
- 28
- 29 • Brush Creek Bridge #1
  - 30 ○ Eastern red bat
  - 31 ○ Hoary bat
  - 32 ○ Silver-haired bat
- 33
- 34 • Laurel Fork Bridge
  - 35 ○ Big brown bat
  - 36 ○ Eastern red bat
  - 37 ○ Little brown bat (*Myotis lucifugus*)
  - 38 ○ Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)
  - 39 ○ Gray bat (*Myotis grisescens*)

1 The acoustic surveys provided no evidence of the Indiana or northern long-eared bats are present in the  
2 workspace for the bridges.

3  
4 Acoustic surveys at the Laurel Fork Bridge picked up a fragmentary call with characteristics associated  
5 with big brown bat, Rafinesque's big-eared bat, and Virginia big-eared bats. Although the file could not  
6 be positively identified, it was most similar to a Virginia big-eared bat. NPS had previously identified  
7 potential Virginia big-eared bat calls at the site; therefore, there is transient potential for Virginia big-  
8 eared bats within the project vicinity. In addition, initial screening provided possible evidence of Gray  
9 bats present at the Laurel Fork Bridge, but a manual review of the data revealed the calls were more  
10 consistent with the eastern red bat.

11  
12 Acoustic surveys at Big Pine Creek #3 detected calls consistent with the tri-colored bat, which is currently  
13 undergoing evaluation for potential listing under ESA. The tri-colored bat is currently listed as State Rare  
14 for Alleghany County as a historical occurrence and has a state rank of S3. The state rank S3 is defined as  
15 Rare or uncommon in North Carolina. The little brown bat is also listed as state rare, but not for  
16 Alleghany or Ashe Counties (NCNHP, 2018). No portals or caves were identified in the immediate  
17 vicinity of the bridges, indicating a lack of potentially suitable winter habitat for northern long-eared or  
18 Indiana bats and year-round habitat for Virginia big-eared and gray bats in the Project area.

19  
20 Visual assessments of the 2A16 bridges revealed no signs of bat use. Signs of bat use were observed at the  
21 Laurel Fork Bridge and Shawtown Road Bridge, which is located just outside of the RSA for Brush Creek  
22 Bridge #1. Subsequent emergence counts and nocturnal visits confirmed the presence of multiple big  
23 brown bats and at least two little brown bats using the Laurel Fork Bridge. Bats of an unknown species  
24 were seen exiting the bridge. Eight big brown bats were incidentally observed roosting under the  
25 Shawtown Road Bridge, which is not part of the project, but is located approximately 700 feet west of  
26 Brush Creek Bridge #1.

27  
28 Detailed information about the studies, methodology, and results can be found in the full bat study  
29 *Protected Bat Species at the Sites of Four Bridges Along the Blue Ridge Parkway, Ashe and Alleghany Counties,*  
30 *North Carolina* (ESI, 2018).

31  
32 For the other federally listed species, Johnson, Mirmiran & Thompson (JMT) scientists conducted  
33 pedestrian transects to perform a detailed tree and vegetation survey as part of the project (JMT, 2018).  
34 Vegetation survey protocols are described in *Vegetation Survey Study Plan NPS/FHWA Projects BLRI*  
35 *2D17 and 2A16 Environmental Assessment and Resource Surveys Related to the Replacement of Four*  
36 *Bridges: Ashe and Alleghany Counties, North Carolina.*

37 Suitable habitat for the Virginia spiraea, swamp pink, and the rusty patched bumble bee was identified  
38 within the RSA for the Laurel Fork Bridge. Additional transect surveys were conducted to thoroughly  
39 search for individuals of Virginia spiraea and swamp pink. Reconnaissance level surveys were conducted  
40 for the rusty patched bumble bee. No individuals were found. A BA was prepared for federally listed  
41 species and submitted to the USFWS.

42  
43 The detailed tree and vegetation survey also identified uncommon, rare, and aesthetically pleasing plant  
44 species that occur within each of the RSAs. The rare and uncommon designation for mountain species  
45 was determined by the *Flora of the Southern and Mid-Atlantic States* (Weakley, 2015). The uncommon  
46 and rare species that carry a state status or state rank are listed below in Table 12 (NCNHP, 2018). None  
47 of these species hold a federal designation. Detailed information and full list of all species found during

1 the survey can be found in the *Tree and Vegetation Survey Report; Blue Ridge Parkway 2A16 and 2D17*  
 2 *Project – Alleghany and Ashe Counties, North Carolina* (JMT, 2018).  
 3  
 4

**Table 12: State Listed Rare Plants Identified within Bridge RSA for Alleghany and Ashe Counties**

Common Name	Scientific Name	State Status	State Rank	Weakley Designation	Within LOD
<b>Big Pine Creek Bridge #3 (Alleghany County)</b>					
Bog fern	<i>Thelypteris simulata</i>	Endangered	S1	Rare	Yes
Brook-saxifrage	<i>Boykinia aconitifolia</i>	W1	S3	Uncommon	Yes
Broadleaf meadowsweet	<i>Spiraea latifolia</i>	W7	S2?	Rare	Yes
Skunk cabbage	<i>Symplocarpus foetidus</i>	W6	S3	Uncommon	Yes
Southern sheepkill	<i>Kalmia carolina</i>	W6	S4	Rare	Yes
<b>Big Pine Creek Bridge #6 (Alleghany County)</b>					
Bog fern	<i>Thelypteris simulata</i>	Endangered	S1	Rare	Yes
Broadleaf meadowsweet	<i>Spiraea latifolia</i>	W7	S2?	Rare	Yes
Skunk cabbage	<i>Symplocarpus foetidus</i>	W6	S3	Uncommon	Yes
<b>Brush Creek Bridge #1 (Alleghany County)</b>					
Bailey's sedge	<i>Carex baileyi</i>	SR-P	S2	Uncommon	No
Broadleaf meadowsweet	<i>Spiraea latifolia</i>	W7	S2?	Rare	Yes
White lettuce	<i>Nabalus albus</i>	Not listed - Alleghany County	S2?	Rare	No
Skunk cabbage	<i>Symplocarpus foetidus</i>	W6	S3	Uncommon	Yes
<b>Laurel Fork Bridge (Ashe County)</b>					
Broadleaf meadowsweet	<i>Spiraea latifolia</i>	W7	S2?	Rare	No
Narrowleaf meadowsweet	<i>Spiraea alba</i>	W1	S2	Rare	No
Choke cherry	<i>Prunus virginiana</i>	W7	S2	Uncommon	No
Skunk cabbage	<i>Symplocarpus foetidus</i>	Not listed for Ashe County	S3	Uncommon	No
Large yellow lady's slipper	<i>Cypripedium parviflorum</i>	Not listed for Ashe County	S1/S2	Uncommon	No
Southern blazing-star	<i>Liatris squarrulosa</i>	Not listed for Ashe County	S2	Rare	Yes

5 Source: NCNHP, 2018

- 1 SR-P (Significantly Rare-Peripheral)
- 2 W1 – Rare, but relatively secure
- 3 W6 - Regionally Rare
- 4 W7 – Poorly known in North Carolina
- 5 S1 – Critically imperiled in North Carolina because of extreme rarity or because of some factor making it especially
- 6 vulnerable to extirpation from the state.
- 7 S2 – Imperiled in North Carolina because of rarity or because of some factor making it very vulnerable to extirpation from
- 8 the state.
- 9 S3 – Rare or uncommon in North Carolina
- 10 S4 – Apparently secure in the state
- 11 S\_? – Rank uncertain.

12  
13 The NCWRC designated all of Big Pine Creek as Hatchery Supported Trout Waters; designated Brush  
14 Creek as Hatchery Supported Trout Waters from the NC 21 bridge to the confluence with the Little  
15 River; and designated Cranberry Creek as Hatchery Supported Trout Waters from the Alleghany County  
16 line to the South Fork of the New River (NCWRC, 2018). These classifications only impose rules and  
17 regulations for fishing in these waterways and would not affect construction activities.

18  
19 Cranberry Creek would be subject to a construction moratorium recommended by NCWRC. NCWRC  
20 has identified state listed aquatic species and Federal Species of Concern occurring downstream of the  
21 Laurel Fork RSA. No state listed aquatic species were identified within the 2A16 bridge RSAs.

22  
23 The NCDEQ identified Big Pine Creek, Brush Creek, and Cranberry Creek as Trout Waters. Trout Water  
24 is a supplemental classification intended to protect freshwaters which have conditions that shall sustain  
25 and allow for trout propagation and survival of stocked trout on a year-round basis. Per the  
26 Sedimentation Pollution Control Act of 1973, G.S. 113A-57(1), waters that have been classified as Trout  
27 Waters shall have an undisturbed buffer zone 25 feet wide or of sufficient width to confine visible siltation  
28 within the 25 percent of the buffer zone nearest the land-disturbing activity, whichever is greater (NCGA,  
29 1973).

30  
31 Brush Creek is designated as part of the New/Little River Aquatic Habitat by NCNHP. Little River and  
32 its tributaries contain a variety of aquatic habitats that support a large diversity of organisms (NCNHP,  
33 2011).

## 34 35 **Environmental Consequences**

---

36 **No Action Alternative**  
37 *Direct and Indirect Impacts*  
38 The No Action Alternative would have no impact on rare, threatened, endangered, and special status  
39 species since there would be no construction. However, the bridges would continue to degrade, erode,  
40 and eventually fail.

41  
42 **Conclusion**  
43 There would be no direct, indirect, or cumulative impacts to rare, threatened, endangered, and special  
44 species under the No Action Alternative, because there would be no construction.

45  
46 **Proposed Action Alternative**  
47 *Direct and Indirect Impacts*  
48 The NPS follows *Management Policies* (NPS, 2006b) for the management of threatened and endangered  
49 plants and animals. Coordination with USFWS is required. A BA was prepared and submitted to the

1 USFWS for the federally listed species potentially impacted by the Proposed Action Alternative (JMT,  
2 2018). A determination of No Effect was made for the Virginia spiraea and swamp pink. A determination  
3 of May Affect – Not Likely to Adversely Affect was made for the NLEB and rusty patched bumble bee.  
4 The extent of suitable habitat is detailed within the BA. In a letter dated November 16, 2018, the USFWS  
5 concurred with these determinations.

6  
7 Northern long-eared bats are known to roost in trees greater than 3in DBH in the summer months. Local,  
8 long term, temporary impacts to the NLEB could occur as several trees greater than 3in DBH would be  
9 cleared during construction activities. No known NLEB maternity roost trees or hibernacula are present  
10 within one-quarter mile of the RSAs. Gray bats typically utilize caves year-round for winter hibernation  
11 and summer roosting. Occasionally summer roosts have been found in bridges or other structures.  
12 Impacts to the gray bat are not anticipated as there is no suitable year-round habitat in the vicinity of the  
13 projects.

14  
15 There would be temporary, adverse impacts to suitable habitat for the rusty patched bumble during  
16 construction for the Laurel Fork Bridge.

17  
18 The locations of state listed plant species have been identified and located during field investigations for  
19 the tree and vegetation survey. With their locations known, construction activities would avoid impacting  
20 these species to the maximum extent practicable. Impacts to state listed species would require  
21 coordination with NCNHP.

22  
23 Indirect impacts would be temporary and would include reduced habitat availability which might limit  
24 immigration into the impacted areas until the vegetation is re-established. Construction activities would  
25 avoid impacting these species habitat to the maximum extent practicable.

26  
27 Because NCWRC has identified state listed aquatic species and Federal Species of Concern occurring  
28 downstream of the Laurel Fork RSA, NCWRC is recommending a moratorium prohibiting in-stream  
29 work and land disturbance within the 25-foot trout buffer from October 15<sup>th</sup> to April 15<sup>th</sup>. NCWRC did  
30 not identify significant trout resources at the 2A16 bridges; therefore, they are not requesting a trout  
31 moratorium (NCWRC Correspondence, September 10, 2018, Appendix B).

32  
33 Per NCDEMLR Rule 15A North Carolina Administrative Code (NCAC) 04B .0125, a land-disturbing  
34 activity in the buffer zone adjacent to a Trout Water stream would be permitted if the duration of the  
35 disturbance is temporary and the extent of the disturbance is minimal. Permission would be received  
36 from NCDEMLR for this work.

37  
38 In addition, the Proposed Action Alternative for Brush Creek Bridge #1 would have beneficial impacts  
39 for general wildlife movement as a wildlife crossing is proposed for this bridge. This wildlife passage is a  
40 proposed engineered shelf along the southern abutment that would help to maintain and enhance the  
41 wildlife habitat connectivity along the riparian corridor and under the roadway. Conversely, the  
42 proposed sediment removal under Big Pine Creek Bridge #3 and #6 would have temporary, adverse  
43 impacts to wildlife movement as their dry walking path would be removed. Removal of the sediment  
44 would force some animals to cross over the BLRI where they would be hit and or cause a vehicle accident.  
45 This impact would be short term since sediment would likely return to its former locations after heavy  
46 stream flows following storms.

1 **Conclusion**

2 Construction of the Proposed Action Alternative would result in temporary, adverse impacts on NLEB  
3 and rusty patched bumble bee habitat. NPS would not allow tree removal during the active bat season  
4 (April 1 to November 1) to reduce the chance the impacting unidentified NLEB bat maternity roosts. The  
5 NPS would install two pole mounted (12-foot to 20-foot in height), multi-chamber bat boxes near the  
6 Laurel Fork Bridge prior to demolition specifically for little brown bats; however, other bat species would  
7 benefit from these boxes. Boxes would be placed as much as possible in the open and away from  
8 trees. Construction activities would occur during daylight hours. Mitigation measures would include  
9 replanting trees for NLEB habitat and re-vegetating disturbed rusty patched bumble bee habitat with  
10 native wildflowers once construction is complete. For trout species at the Laurel Fork Bridge, NPS would  
11 adhere to the October 15 to April 15 moratorium. The proposed project would comply with the  
12 Endangered Species Act and NPS *DO #77 "Natural Resource Management."*  
13

14 **Cumulative Impacts:** Past bridge and roadway improvement projects along the BLRI have resulted in  
15 minor long-term adverse impacts to suitable habitat for federal and state listed threatened, endangered,  
16 rare, and special status species from construction-related disturbances. Current and future improvement  
17 projects would also result in minor long-term adverse impacts to wetlands from vegetation clearing  
18 necessary to construct the new facilities. The 2A16 and 2D17 projects require vegetation clearing that  
19 would be noticeable, but only a small percentage of existing area in the context of the BLRI. Mitigation  
20 measures such re-vegetating and re-grading disturbed areas within the RSAs would ultimately result in a  
21 minor adverse impact to suitable habitat for federal and state listed threatened, endangered, rare, and  
22 special status species. Overall, the Proposed Action Alternative would contribute a minor increment to  
23 the adverse cumulative impact of other projects and actions to suitable habitat for federal and state listed  
24 threatened, endangered, rare, and special status species. The cumulative impact would be minor.

25 CULTURAL RESOURCES

---

26 *HISTORIC STRUCTURES*

---

27 **Affected Environment**

---

28 The BLRI was determined eligible for listing in the NRHP in 1990 (NC0001/BN0905) and is under the  
29 management of the NPS. The nomination is currently in development by the NPS. There are no currently  
30 listed National Register Historic Properties, or locally designated historic districts or properties within  
31 any of the APEs. However, a nomination for the BLRI Historic District NHL is currently in development  
32 by the NPS. All four bridge locations are considered contributing elements to the proposed district.

33 **Environmental Consequences**

---

34 **No Action Alternative**

35 The No Action Alternative would have a negative effect on historic structures within the RSAs as the  
36 deterioration of the bridge structures would continue. The bridges would continue to degrade, erode,  
37 and eventually fail.

38 **Conclusion**

39 There would be no direct, indirect, or cumulative impacts to historic structures under the No Action  
40 Alternative, because there would be no construction. However, deterioration of the bridge structures  
41 would continue.

1 **Proposed Action Alternative**

2 The bridges are contributing resources to the proposed BLRI Historic District NHL nomination  
3 currently under development by NPS. While it is preferable to preserve, repair, or restore (in that order)  
4 over reconstruction, the current poor condition of these bridges require their replacement. As such, the  
5 replacement of the four bridges would result in an adverse effect to cultural resources associated with the  
6 BLRI. The project proposes bridge replacements would be reconstructed along on their existing  
7 alignments. Due to the historical importance of the existing stone-faced abutments and piers, NPS  
8 proposes to reuse the existing stone masonry to the maximum extent possible, leaving as many existing  
9 elements in place as possible. The NPS intends to keep the proposed bridge rail appearance consistent,  
10 to the extent practicable, with the existing look.

11  
12 To begin the Section 106 consultation process (in compliance with the NHPA, 54 U.S.C. § 306108 and its  
13 implementing regulations, 36 CFR § 800), NPS submitted a notification letter, along with a graphic  
14 illustration of a draft APE for each bridge, to NCSHPO and THPOs (Appendix B). The draft APEs  
15 provided a preliminary basis for assessing potential historic properties that could be affected by the  
16 proposed undertakings. They include each bridge along with adjacent related structures with a potential  
17 for a direct or indirect effect. Included in the APEs for each bridge, are the following:

- 18 • Big Pine Creek Bridge #3 (Latitude/Longitude: 36.497001; -80.96449)
  - 19 ○ Cast-in-place concrete decks, stone abutments, and stone and/or concrete piers,
  - 20 timber guardrails with concrete posts, constructed from 1936-1938
  - 21
- 22 • Big Pine Creek Bridge #6 (Latitude/Longitude: 36.487429; -80.974755)
  - 23 ○ Cast-in-place concrete decks, stone abutments, and stone and/or concrete piers,
  - 24 timber guardrails with concrete posts, constructed from 1936-1938
  - 25
- 26 • Brush Creek Bridge #1 (Latitude/Longitude 36.461241; -81.000474)
  - 27 ○ Cast-in-place concrete decks, stone abutments, and stone and/or concrete piers,
  - 28 timber guardrails with concrete posts, constructed from 1936-1938
  - 29
- 30 • Laurel Fork Bridge (also known as the Laurel Fork Viaduct) (Latitude/Longitude  
31 36.387934, -81.259914)
  - 32 ○ 5-span, two-girder steel bridge with cast-in-place concrete deck, constructed in
  - 33 1939
  - 34

35 Due to the total replacement of the Laurel Fork Bridge and the replacement of the superstructure on the  
36 three remaining bridges, this project would have an Adverse Effect on the bridges as contributing  
37 resources to the eligible BLRI Historic District. The project would also impact other character-defining  
38 features of the BLRI including masonry drainage channels, parapet guard-walls, rock embankments and  
39 freestanding guard walls. A MOA was developed to determine the level of mitigation for the proposed  
40 project (Appendix D). Mitigation measures include a North Carolina Historic Structures Survey Report  
41 covering the four bridges and a Level II, HAER recordation covering the four bridges.

42  
43 No indirect impacts are anticipated as a result of the proposed project.

44  
45 **Conclusion**

46 Due to the total replacement of the Laurel Fork Bridge and the replacement of the superstructure on the  
47 three remaining bridges, this project would have an Adverse Effect on the bridges as contributing

1 resources to the eligible BLRI Historic District. A MOA, executed May 30, 2019, was developed in  
2 consultation with NPS, FHWA, NCSHPO, and THPOs. Mitigation includes reconstructing the bridges  
3 along their existing alignments to preserve the BLRI alignment, designing the new bridges to emulate the  
4 original styles, re-using the existing stone to the extent practicable for the new piers and abutments,  
5 preparing a North Carolina Historic Structures Survey Report covering the four bridges, and preparing  
6 a HAER recordation covering the four bridges. Stipulations related to inadvertent discoveries during  
7 construction will be included. The proposed project would comply with the NHPA, DO #28, and the  
8 NPS Organic Act.

9  
10 **Cumulative Impacts:** Past bridge and roadway improvement projects along the BLRI have resulted in  
11 adverse impacts to historic structures from structure repairs and replacements. Current and future  
12 improvement projects would also result in adverse impacts to historic structures to construct the new  
13 facilities. The BLRI as a whole is aging and many repairs/replacements would be needed for historic  
14 bridges and other structures as they are approaching the end of their service lives. The 2A16 and 2D17  
15 projects are just four bridges of the 168 bridges present along the BLRI. Overall, the Proposed Action  
16 Alternative would contribute a minor increment to the adverse cumulative impact of other projects and  
17 actions to historic structures. The cumulative impact would be minor.

## 18 VISITOR USE

---

### 19 Affected Environment

---

20 The BLRI was designated as a National Parkway in 1936, a National Scenic Byway in 1996 (NC portion)  
21 and 2005 (Virginia portion), and an All-American Road. A National Parkway is a designation for a  
22 protected area in the United States and is given to a scenic roadway and a protected corridor of  
23 surrounding parkland. National Parkways are maintained by both NPS and FHWA through the Federal  
24 Lands Transportation Program (23 U.S.C. 203). The National Scenic Byways Program is administered by  
25 FHWA and established under the Intermodal Surface Transportation Efficiency Act of 1991. Most scenic  
26 byways are designated All-American Roads. This designation means the roadway must have features that  
27 do not exist elsewhere in the United States and are unique and important enough to be tourist  
28 destinations unto themselves. The paved roadway is about 20 feet wide with wider pavement on curves  
29 and no paved shoulders. It has a maximum speed limit of 45 mph, with a speed limit of 35 mph in many  
30 of the recreation areas. By definition as a national rural parkway, the BLRI is to be managed as a limited  
31 access roadway.

32  
33 The BLRI is America's longest linear park noted for its scenic beauty. It is the most visited unit in the  
34 national park system and runs for 469 miles through 29 Virginia and North Carolina counties. In 2017,  
35 the NPS reported that the BLRI had a total of 16,093,765 visitors and an average of 14,628,612 visitors for  
36 the past five years. The peak of visitors is historically in the month of October with an average of 2,198,403  
37 visitors (1984-2017) (NPS Stats, 2018). There are numerous access points but no direct interchanges to  
38 interstate highways on the BLRI. Most access points are along many large and smaller roads in Virginia  
39 and North Carolina. Engineers also developed small side roads that serve as access points to various NC  
40 highways. There are 11 major access points along the BLRI with three in Virginia and eight in North  
41 Carolina. The BLRI provides views of historic farmsteads, old farm fields, stream valleys, wooded  
42 mountainsides, and bluff-top vistas.

43  
44 The BLRI is unique in that there are no entrance stations, no fees, and the roadway itself is the main park  
45 experience. Recreational trips make up the majority of trips along the BLRI. With no entrance fees, the  
46 BLRI also handles a relatively large amount of nonrecreational trips as local residents use the roadway

1 for commuting or personal business, especially in the more urbanized areas. As more residential  
2 development is occurring along the rural section of the BLRI these sections of the BLRI are also subject  
3 to more nonrecreational traffic use.

4  
5 The RSAs are located within the Highlands segment of the BLRI (Mileposts 217 to 305). This segment  
6 offers the greatest variety of views and gives visitors a strong sense of “being away from it all.” The  
7 designed landscape in this segment retains much integrity of original vistas, landscaped bays, agricultural  
8 leases, stone walls, and wood fences (NPS, 2013)

9  
10 The original design intent of the BLRI was to provide a full-service destination park that accommodates  
11 all visitors’ needs, including scenic driving, recreational activities, food services, overnight facilities, and  
12 educational and interpretive opportunities.

13  
14 The provision of a scenic driving experience was the primary goal of the original BLRI design. The  
15 character of the final driving route varies due to the different characteristics of the land through which  
16 the BLRI was located. Depending upon where visitors access the BLRI, their scenic driving experience is  
17 primarily influenced by five factors: (1) landscape position of the roadway, (2) vegetation along the  
18 roadway, (3) land use seen from overlooks and vistas, (4) air quality, and (5) the weather.

19  
20 The BLRI sees a variety of recreation visitors and non-recreation visitors. Day visitors include motorists,  
21 motorcyclists, bikers, runners, and hikers. Overnight recreation visitors include concession lodging, tent  
22 campers, RV campers, backcountry campers, and other miscellaneous campers. The high season for travel  
23 along the BLRI is generally between May and October, with peaks for the summer travel season and in  
24 October for the viewing of the fall leaves (NPS, 2013). Traffic counts at mile post 229.6 (U.S. 21 at Roaring  
25 Gap Left) show an average of 3,914 vehicles per month in 2017 with the peak month in July with an  
26 average of 7,867 vehicles per month (1988-2017) (NPS Stats, 2018). Other popular outdoor recreational  
27 activities along the BLRI include picnicking, photography, bird watching, fishing, camping, and  
28 horseback riding. Several hiking trails are located right off the BLRI. The BLRI is open year-round, with  
29 the highest visitation in the summer and fall.

30  
31 Although recreational trips comprise the majority of BLRI use, nonrecreational trips comprise a  
32 substantial amount of traffic traveling the BLRI. Nearby residents use the BLRI for local access and this  
33 commuter traffic adds pressure to BLRI use. NPS staff note that some commuters prefer to use the BLRI  
34 P as a “nice” drive to work and landowners in proximity to the BLRI want to maintain local traffic access.  
35 High levels of nonrecreational use of the BLRI can affect visitor experience. Recreational visitors feel  
36 some areas are too congested due to local traffic and resent congestion where local road connections are  
37 used. However, some visitors enjoy the ability to frequently exit the BLRI for services. Many visitors  
38 acknowledge the need for more BLRI infrastructure, but do not want to alter the BLRI’s natural features  
39 or rural feeling (NPS, 2013).

40  
41 No commercial truck traffic is allowed on the BLRI, and no transit services are provided. In keeping with  
42 its designation as a scenic parkway and emphasis on the driving experience, the vast majority of vehicles  
43 are passenger vehicles (79%), followed by motorcycles (12%), which constitute a much higher  
44 percentage than the general motorcycle population. Other motorists tend to dislike the number of  
45 motorcycles and the noise they emit. Complaints about speeding (the BLRI’s speed limit is 35 to 45 mph),  
46 illegally altered exhausts, and dangerous behavior related to motorcyclists have become very common  
47 and can affect the visitor experience. Many BLRI accidents involve motorcycles, particularly in the  
48 southern section where the roadway geometry is more varied and includes descending radius curves  
49 (NPS, 2013).

1 The bridge RSAs are located within the Highlands Segment of the BLRI (Mileposts 217–300). This  
2 segment extends 83 miles and includes Doughton Park, and the Moses H. Cone and Julian Price  
3 Memorial Parks. There are several bridges in the first 15 miles of this segment and several bridges in the  
4 Boone/Blowing Rock area. The primary BLRI access points are as follows:  
5

- 6 • NC 18 (milepost 217.3) is the first access point in North Carolina. Less than one mile east of the  
7 BLRI, NC 18 ends at NC 89, which connects to VA 89 at the state line and provides access to the  
8 town of Mount Airy on the east side.
- 9 • U.S. 21 (milepost 229.6) provides access to Stone Mountain State Park, connects with I-77 to the  
10 south and the town of Sparta to the north.
- 11 • U.S. 421 (milepost 276.3) provides access to Wilkesboro and Winston-Salem to the east and the  
12 town of Boone to the west.
- 13 • U.S. 221 runs parallel to the BLRI and has several access points in this area, including at milepost  
14 292.0 near the town of Blowing Rock.

15  
16 There are six road closure gate locations in this segment. Sections are often closed during the winter for  
17 long periods of time. This segment has the second-most at grade intersections (76 total) of the BLRI  
18 segments, including about 40 secondary state highways and about 25 private access roads. Secondary  
19 road improvement pressures are greater in this segment than other areas on the BLRI due to increased  
20 residential development near the BLRI (NPS, 2013).  
21

22 A segment of the Mountains to Sea Trail passes through the RSA for the Laurel Fork Bridge. The  
23 Mountains to Sea Trail is North Carolina’s state hiking trail. It stretches from 1175 miles Clingman’s  
24 Dome in the Great Smoky Mountains National Park to Jockey’s Ridge State Park by the Atlantic Ocean.  
25 The segments of the Mountains to Sea Trail along the BLRI were designated as a national recreation trail  
26 in 2005. The frequently used trail is located within the RSA. Even though the trail does not cross the BLRI  
27 in the vicinity of the RSA and hikers to not access the bridge, the trail crosses through the project limits  
28 for construction.  
29

## 30 **Environmental Consequences**

---

### 31 **No Action Alternative**

#### 32 *Direct and Indirect Impacts*

33 The No Action Alternative would have a negative impact on visitor use as the deterioration of the bridge  
34 structures would continue. The bridges would continue to degrade, erode, and eventually fail. Currently,  
35 all four bridges are structurally deficient and would require significant maintenance to remain open and  
36 safe to travelers.  
37

#### 38 **Conclusion**

39 As the bridges continue to deteriorate, more maintenance would be needed. Eventually over time, the  
40 bridges and section of the BLRI would need to be closed.  
41

### 42 **Proposed Action Alternative**

#### 43 *Direct and Indirect Impacts*

44 This project is needed to replace/rehabilitate the four bridges deemed structurally deficient and to  
45 improve safety for parkway visitors by replacing substandard height railings according to current  
46 roadway design standards. The Proposed Action Alternative would have beneficial impacts from

1 improved safety by meeting current design standards and continued use of the bridges along the BLRI.  
2 Guardrail and guard walls will be designed in accordance with “Roadside Barrier Warranting and  
3 Assessment of Adverse Effects Screening Methodology” approved as part of the *Guardrail Replacement  
4 and Installation Programmatic Environmental Assessment, Appendix B, Roadside Cultural Resources  
5 Preservation: A guide to Assessing the Effects of Roadside Safety Implementation on the Blue Ridge Parkway  
6 (2009)* and subsequent Finding of No Significant Impact (FONSI) signed 10/2010.  
7

8 There would be a decrease of temporary closures needed for maintenance at these bridges. The  
9 replacement/rehabilitation of the bridges would have negligible effects on transportation as traffic  
10 volumes would not increase or decrease as a result of the project. Full road closure of the BLRI would  
11 last throughout the duration of construction for each bridge. Construction for each bridge would be  
12 expected to last from one to two years and would result in a temporary increase in noise from  
13 construction activities. Temporary detours are proposed and would create a temporary, minor increase  
14 in road traffic along the detour route (Figures 3A and 3B). Traffic would be diverted from the BLRI onto  
15 local public roads. These detours would be temporary, short term impacts to visitor experience as this  
16 would alter the driving experience of the BLRI. The detour for the 2A16 bridges would begin at mile post  
17 217.3 and direct traffic onto NC 18 southbound towards US 21. The detour continues on US 21 until its  
18 intersection with the BLRI at mile post 229.7. An alternative route for recreational vehicles would  
19 continue south along NC 18 until its intersection with the BLRI at mile post 248.1 (Figure 3A). The detour  
20 for the 2D17 bridge would begin at mile post 248.1 and direct traffic onto NC 18. From NC 18, traffic  
21 would be directed to NC 88, then onto NC 16 until Trading Post Road. From Trading Post Road, traffic  
22 would continue on the BLRI at mile post 258.7 (Figure 3B).  
23

24 The Mountains to Sea Trail does not use the Laurel Fork Bridge; however, it runs below the bridge within  
25 the project limits. The trail does share the alignment with South Laurel Fork Road which would be  
26 utilized for construction traffic. Visitor use of the trail and construction access would be in conflict as it  
27 is currently aligned. The options considered by NPS would be to leave the trail as-is, temporarily realign  
28 the trail, or temporarily close the trail during construction. The segment of the Mountains to Sea Trail  
29 within the RSA would need to either be closed or rerouted. Detours of roadway traffic and hiking traffic  
30 during construction would result in a short-term, temporary impact to visitors. There would also be short  
31 term, temporary impacts to the visual environment from the vegetation clearing needed for construction.  
32

33 No indirect impacts are anticipated as a result of the Proposed Action Alternative.  
34

### 35 **Conclusion**

36 Construction of the Proposed Action Alternative would have beneficial impacts to transportation and  
37 visitor use as the BLRI would remain open to visitors in the long term. Replacement/rehabilitation of the  
38 bridges would bring them to current design standards required for the safety of BLRI visitors. Temporary  
39 impacts would be due to detours needed to reroute traffic around construction activities. There would  
40 be temporary adverse impacts to the segment of the Mountains to Sea Trail within the Laurel Fork Bridge  
41 RSA. Through coordination with Mountains to Sea Trail, trail closure for the duration of the  
42 construction would be the recommended preferred alternative. Leaving the trail as-is and temporarily  
43 realigning the trail were dismissed due to unsafe condition between trail users and construction activities.  
44

45 There would also be temporary adverse impacts to park concession operations and park campgrounds  
46 utilized by visitors. The Bluffs Coffee Shop and the Raccoon Holler Camp and Recreation Vehicle Park  
47 was identified within the limits of the BLRI that will be closed during construction. The Bluffs Coffee

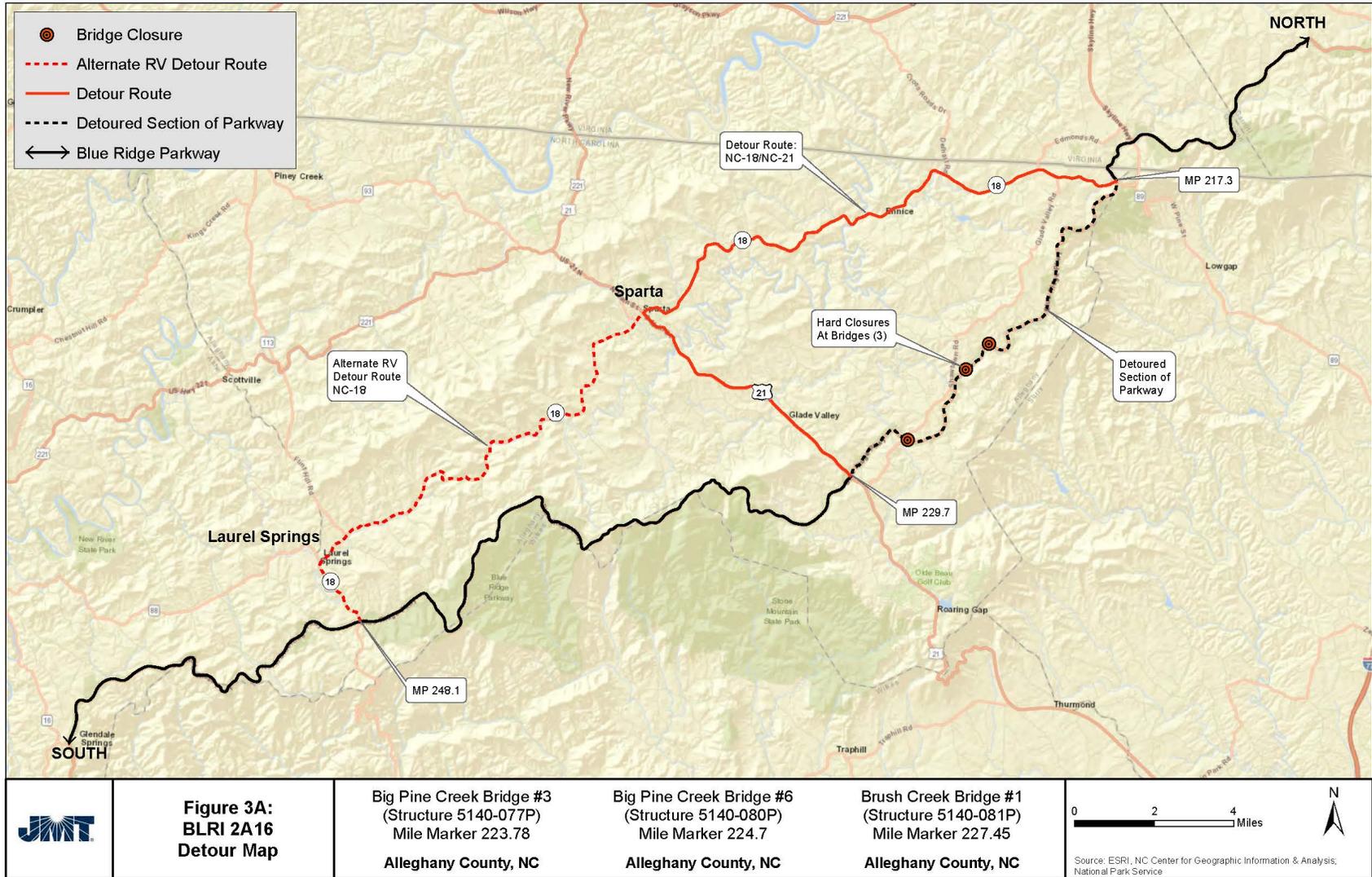
1 Shop is an historic structure within the Doughton Park recreation area that housed a restaurant and store  
2 for many years. In 2010 the concession that ran the coffee shop and store closed the businesses. The  
3 facility sat idle and fell into disrepair. Now, thanks to several important community partnerships, the  
4 facility is being renovated. The store was reopened in 2018 and the restaurant is scheduled to re-open in  
5 2020 as a concession facility.

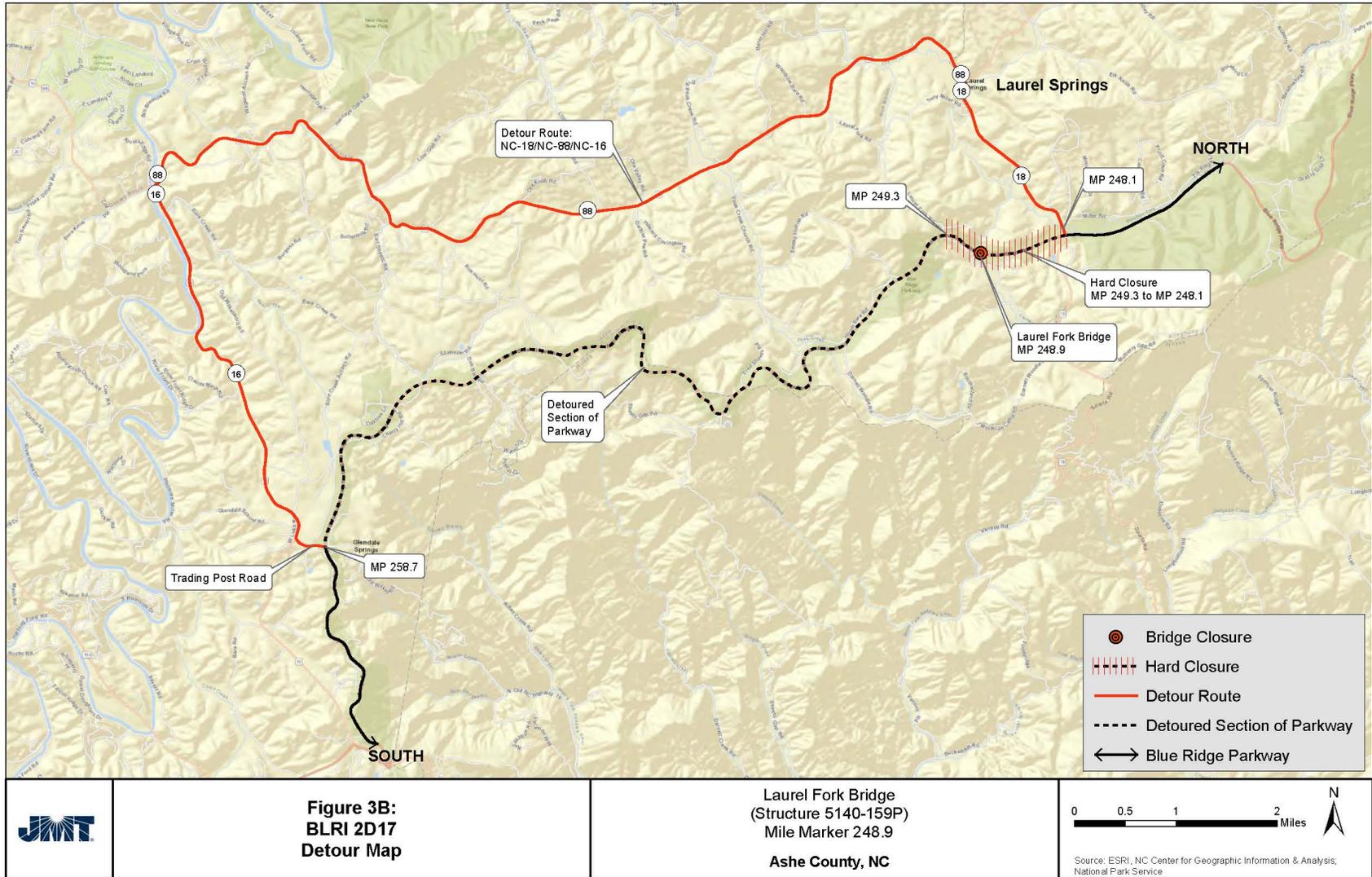
6 Reconstruction of the 2A16 bridges was scheduled to begin in late 2019, last for 2 years, and be followed  
7 immediately by the construction of 2D17 for 3 years. Combined, the detours for the projects would result  
8 in BLRI closures with detours in the vicinity of the Bluffs Coffee Shop for 5 years in a row. The detours  
9 required for the projects would not prevent access to the Doughton Park and the Bluffs Coffee Shop.  
10 However, park management recognized the potential of impacts to visitation to Doughton Park due to  
11 either perceived impacts, visitors choosing other non-interrupted sections of the BLRI for their journeys,  
12 visitors detoured into the surrounding towns finding alternate places to stop, eat and shop or other  
13 reasons possibly related to the detour. In order to give a “cushion” of time between the opening of the  
14 Bluffs Coffee Shop restaurant and the detour period, park management decided to postpone the projects  
15 by two years. This decision was made to mitigate any impacts, real or perceived, that the detours could  
16 have on the successful reopening and re-establishment of the Bluffs Coffee Shop as an important  
17 destination and amenity on the BLRI.

18 Mitigation measures would include implementing BLRI -wide or site-specific traffic control plans, as  
19 warranted, during construction. Standard measures would include strategies to maintain safe and  
20 efficient traffic flow. Project sequencing and road closures would be planned to minimize impacts to  
21 BLRI visitors, concession operations, and neighboring communities. Mitigation measures also include  
22 re-vegetation would be proposed in the disturbed areas for each of the RSAs. The proposed project  
23 would comply with NPS DO #12.

24

25 **Cumulative Impacts:** Cumulative impacts to transportation and visitor use would be negligible since  
26 past, current, and future roadway improvement projects are intended to facilitate transportation and  
27 visitor use of the BLRI.





## 1 CHAPTER 4: PUBLIC INVOLVEMENT AND COORDINATION

---

2 This chapter documents the scoping process for this project and includes the official list of recipients for  
3 the document. As required by NPS policies and planning documents, it is the park's objective to work  
4 with federal, state, and local governmental and private organizations to ensure that the park and its  
5 programs are coordinated with theirs, and are supportive of their objectives, as far as proper management  
6 of the park permits, and that their programs are similarly supportive of park programs.

### 7 PUBLIC INVOLVEMENT

---

8 Comments from the public were solicited at two stages in the project planning process, public scoping  
9 and the public comment period. Information about the proposed project was made available to the public  
10 on the NPS's Planning, Environment, and Public Comment website:  
11 <https://parkplanning.nps.gov/projectHome.cfm?projectID=82234>; and FHWA's website:  
12 <https://flh.fhwa.dot.gov/projects/nc/blri2d17-2a16-environmental-assessment/> during the public  
13 scoping comment period, from August 10, 2018 through September 10, 2018. Scoping letters providing  
14 details of the proposed project and contact information for comments were sent to a mailing list  
15 comprised of federal and state agencies, and local governments, elected officials, organizations, and  
16 advocacy groups. A legal notice was run in the *Carolina Outdoors Guide*, *Ashe Post & Times*, *National*  
17 *Parks Traveler*, and the *Augusta Free Press* websites on August 2018 announcing the public scoping  
18 comment period.

19  
20 During the comment period, 12 correspondences were received by mail or through the PEPC system.  
21 Two comments were received from individuals, one comment was received by a non-governmental  
22 organization, five comments were received from state government agencies, and four comments were  
23 received from federal government agencies. The commenters provided regulatory guidance, suggestions,  
24 and opinions for the project. None of the 12 comments opposed the project.

25  
26 This EA will be available for public review from May 1, 2019 through June 1, 2019. During this 30-day  
27 period, hardcopies of the EA may be requested by contacting Dawn Leonard, NPS Community Planner,  
28 at (828) 348-3434. An electronic version of this document can be found on the NPS's PEPC website at  
29 <https://parkplanning.nps.gov/projectHome.cfm?projectID=82234>. This site provides access to current  
30 plans, environmental impact analyses, and related documents on public review. An electronic version  
31 may also be found at the FHWA, Eastern Federal Lands Highway Division's website at  
32 <https://flh.fhwa.dot.gov/projects/nc/blri2d17-2a16-environmental-assessment/>.

33  
34 Comments on this EA will be summarized and responded to in an Errata sheet to be appended to the  
35 decision document.

### 36 AGENCY AND ENVIRONMENTAL PERMIT COORDINATION

---

#### 37 Agency Coordination

---

38 Appendix B contains copies of written correspondence with the federal and state agencies, and local  
39 governments that were contacted during the planning process.

1 *Endangered Species Act of 1973 Coordination and Consultation*

2 It was determined that suitable habitat for the federally listed NLEB occurred within 2A16 and 2D17  
3 bridge RSAs and suitable habitat for the federally listed rusty-patched bumble bee, swamp pink, and  
4 Virginia spiraea occurred with the in 2D17 bridge RSA. In addition, previous bat studies conducted by  
5 NPS identified the potential for transient gray bats. A Study Plan was prepared for protected bat studies  
6 and submitted to the USFWS on July 24, 2018. After approval, field investigations were conducted August  
7 5 through 7, 2018. Surveys for the other federally listed species were conducted from August 5 through  
8 17, 2018. No individual species were found. On September 24, 2018, the Protected Bat Studies Report,  
9 summarizing the results of the field investigation, was submitted to USFWS. NPS and FHWA also  
10 determined that the project would not result in any prohibited incidental take of the NLEB. A BA based  
11 on the results of species surveys and the Protected Bat Studies was submitted to the USFWS on October  
12 12, 2018 recommending a Biological Conclusion of “May Affect, Not Likely to Adversely Affect” for the  
13 NLEB, gray bat, and rusty patched bumble bee; and a biological conclusion of “No Effect” for swamp  
14 pink and Virginia spiraea. In a letter dated November 16, 2018, the USFWS concurred with these  
15 determinations (Appendix B).

16  
17 *National Historic Preservation Act of 1966 Coordination and Consultations; Executive Order 13175*

18 In July 2018, JMT performed the cultural resource records search at the NCSHPO to determine if  
19 previously recorded historic properties, including archeological sites, are located in or adjacent to the  
20 undertaking. This search indicated that one historic property, the BLRI, an NPS-managed property  
21 eligible for the NRHP, is located in the boundaries of the proposed undertaking. The FHWA and the  
22 NPS have previously determined that the undertaking would have an adverse effect to sections of this  
23 historic property. One archeological site, 31AH259, is located approximately 1500 feet north of the  
24 Laurel Fork Bridge and has been recorded as potentially eligible for listing to the NRHP. As it is located  
25 far outside the area for direct effects, no effects to this site are anticipated. A scoping letter was sent to  
26 the NCSHPO for the agency to assess the potential for the project to impact these known sites and any  
27 potential unknown sites. In a letter dated September 24, 2018 the NCSHPO determined that the  
28 proposed project would have an adverse effect on the BLRI. The FHWA, NPS, NCSHPO developed a  
29 MOA to address adverse effects to the BLRI resulting from the construction of this project (Appendix  
30 D). The ACHP declined to participate in a letter dated October 5, 2018.

31 *EO 13175 “Consultation with Indian Tribal Governments”* requires federal agencies to initiate tribal  
32 consultation to enhance government to government relationship, communication, and coordination. In  
33 a response to the scoping letter for the project, the Catawba Indian Nation wished to be consulted and  
34 information provided when the Phase I studies are completed in an email dated September 5, 2018. The  
35 Catawba Indian Nation also provided a policy and procedures document for the inadvertent discovery  
36 of burial. This document is incorporated into the MOA. The Cherokee Nation requested in a letter dated  
37 September 14, 2018 that a cultural resource survey be conducted and provided to the Cherokee Nation  
38 for bridge project 2D17. Furthermore, the Cherokee Nation deferred to federally recognized Tribes that  
39 have an interested in the land base for Project 2A16. The United Keetoowah Band of Cherokee Indians  
40 in Oklahoma responded by email on September 12, 2018 stating that the proposed project lies within the  
41 traditional territory of the United Keetoowah Band of Cherokee Indians in Oklahoma and requested a  
42 cultural resource survey. In an email sent September 19, 2018, the Shawnee Tribe concurred that no  
43 known historic properties would be negatively impacted by this project. The Absentee Shawnee Tribe of  
44 Oklahoma responded with a letter dated October 4, 2018 and stated they have no objection to the  
45 proposed project; however, they remain interested in further communications regarding this project due  
46 to its location as historically the Shawnee people have documented presence in North Carolina. The  
47 Absentee Shawnee Tribe of Oklahoma requested notification and consultation of the APE changes or if

1 the project inadvertently discovers archeological evidence, human remains, and/or other cultural items  
2 liable under the Native American Graves Protection and Repatriation Act. The Eastern Band of Cherokee  
3 Indians responded with an email dated January 9, 2019 and stated that they wish to partake in the  
4 consultation of this project and be notified in the case of an inadvertent discovery. In addition, protocols  
5 for the treatment of human remains in the case of inadvertent discovery were incorporated into the  
6 MOA.

## 7 **Permits**

---

9 If the Proposed Action Alternatives were implemented, several permits and notices would be required  
10 in order to construct the project. These permits include:

### 11 *Clean Water Act Section 404 Permit*

12 The Federal Water Pollution Control Act, more commonly known as the "Clean Water Act," under  
13 Section 404, directs the Secretary of the Army, acting through the Chief of Engineers, to issue permits for  
14 the discharge of dredged or fill material into WOUS. This project would discharge fill material into  
15 WOUS, including special aquatic sites such as wetlands. The proposed project would most likely qualify  
16 for coverage under Nationwide Permit 3, Maintenance. The review period is typically 45 calendar days  
17 for Nationwide Permits.

### 19 *401 Water Quality Certification*

20 The 401 Water Quality Certification is a "certification" needed for any federal permit involving impacts  
21 to water quality. Most 401 Certifications are triggered by Section 404 Permits issued by the USACE.  
22 Typical types of projects involve filling in surface waters or wetlands. Section 401 of the Clean Water Act  
23 delegates authority to the States to issue a 401 Water Quality Certification for all projects that require a  
24 federal permit (such as a Section 404 Permit). The "401" is essentially verification by the State that a given  
25 project would not remove or degrade existing, designated uses of "Waters of the State," or otherwise  
26 violate water quality standards. Mitigation of unavoidable impacts and inclusion of stormwater  
27 management features are two of the most important aspects of water quality review. This certification is  
28 issued by the NCDEQ. NCDEQ normally issues 401 Certification within 60 days of receipt of a complete  
29 application.

### 31 *Erosion & Sediment Control Permit (E&SC)*

32 In North Carolina, construction activities that disturb an acre or more of land require an E&SC Plan that  
33 has been approved by the state. After the state approves the E&SC Plan, the project has been considered  
34 by NCDEQ to have automatic coverage under a NPDES Stormwater General Permit NCG010000 for  
35 construction-related activities, provided that the ground stabilization and basin design requirements in  
36 the stormwater permit are included in the E&SC Plan  
37

## 38 **LIST OF PREPARERS AND REVIEWERS**

---

39 The following individuals contributed to the development of this document:

### 40 Federal Highway Administration

41 Ryan Kimberley	Environmental Protection Specialist
42 Michael Tessitore, PE	Project Manager

1	<u>National Park Service</u>	
2		
3	Dawn Leonard	Community Planner
4	John McDade	Cultural Resources Manager
5	Robert Cherry	Resource Management Specialist
6	Lillian McElrath	Resource Management Specialist
7	Michael Molling	Chief of Maintenance
8	Andy Otten	Project Specialist/Landscape Architect
9	David Anderson	Landscape Architect
10	Bambi Teague	Supervisor Biologist
11		
12	<u>Johnson, Mirmiran &amp; Thompson</u>	
13		
14	Ian Frost, AICP, CEP, LEED AP	Project Manager
15	Tina Sekula, PWS, CEP	Deputy Project Manager, NEPA Lead
16	Garrett Silliman, RPA	Archeology Lead
17	Mary Alfson Tinsman	Historic Architectural Lead
18	Ray Bode, PWS	Natural Resources Lead
19	Sara McLaughlin	Senior Architectural Historian
20	Tyson Kurtz	Environmental Scientist
21	Ashley Wilkins	Environmental Scientist/GIS Technician
22		
23	<u>Environmental Solutions &amp; Innovations, Inc.</u>	
24		
25	Dale Sparks, Ph.D	Protected Bat Species Lead

## CHAPTER 5: REFERENCES

---

- CEQ, 1997. *Considering Cumulative Effects under the National Environmental Policy Act*.  
[https://www.energy.gov/sites/prod/files/nepapub/nepa\\_documents/RedDont/G-CEQ-ConsidCumulEffects.pdf](https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-ConsidCumulEffects.pdf).
- CEQ Regulations for Implementing the Procedural Provisions of NEPA, 1978.
- Environmental Laboratory, 1987. *U.S. Army Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS.
- Environmental Solutions and Innovations, Inc. (ESI), 2018. *Protected Bat Studies at the Sites of Four Bridges Along the Blue Ridge Parkway, Ashe and Allegheny, Counties, North Carolina*. NPS and FHWA Projects: BLRI 2D17 and 2A16.
- Federal Emergency Management Agency (FEMA), 2009a. Floodmap Service Center, “Digital Flood Rate Insurance Map, Alleghany County, NC, Panel #3711402000J”.  
<https://msc.fema.gov/portal/advanceSearch>. Accessed August 23, 2018.
- Federal Emergency Management Agency (FEMA), 2009b. Floodmap Service Center, “Digital Flood Rate Insurance Map, Alleghany County, NC, Panel #3711401000J”.  
<https://msc.fema.gov/portal/advanceSearch>. Accessed August 23, 2018.
- Federal Emergency Management Agency (FEMA), 2009c. Floodmap Service Center, “Digital Flood Rate Insurance Map, Alleghany County, NC, Panel #3710491900J”.  
<https://msc.fema.gov/portal/advanceSearch>. Accessed August 23, 2018.
- Federal Emergency Management Agency (FEMA), 2009d. Floodmap Service Center, “Digital Flood Rate Insurance Map, Ashe County, NC, Panel #3710393600J”.  
<https://msc.fema.gov/portal/advanceSearch>. Accessed August 23, 2018.
- Federal Highway Administration (FHWA), 2016. Design Scoping Report. FTNP-BLRI 2A16. PMIS Number: 228076 for Blue Ridge Parkway, Alleghany County, North Carolina. Department of Interior. National Park Service. Federal Highway Administration Eastern Federal Lands Highway Division. Sterling, Virginia.
- Federal Highway Administration (FHWA), 2017. Design Scoping Report. NP-BLRI 2D17. For Blue Ridge Parkway, Alleghany County, North Carolina. Department of Interior. National Park Service. Federal Highway Administration Eastern Federal Lands Highway Division. Sterling, Virginia.
- Johnson, Mirmiran & Thompson (JMT), 2018. *Waters of the U.S., Including Wetlands, Delineation, and Functional Assessment Report; Blue Ridge Parkway 2A16 and 2D17 Project – Alleghany and Ashe Counties, North Carolina*.
- National Park Service (NPS), 2003. *Procedural Manual #77-2: Floodplains Management*.  
<https://www.nature.nps.gov/rm77/floodplain.cfm>.

- 1 National Park Service (NPS), 2006a. Doughton Park and Sections 2A, B, and C. Blue Ridge Parkway.  
2 Cultural Landscape Report. Southeast Regional Office, Cultural Resources Division.  
3
- 4 National Park Service (NPS), 2006b. *Management Policies*. [https://www.nps.gov/policy/MP\\_2006.pdf](https://www.nps.gov/policy/MP_2006.pdf).  
5
- 6 National Park Service (NPS), 2009. “Roadside Barrier Warranting and Assessment of Adverse Effects  
7 Screening Methodology.” *Guardrail Replacement and Installation Programmatic Environmental*  
8 *Assessment, Appendix B, Roadside Cultural Resources Preservation: A guide to Assessing the Effects*  
9 *of Roadside Safety Implementation on the Blue Ridge Parkway*.  
10
- 11 National Park Service (NPS), 2010. Finding of No Significant Impact. Guardrail Replacement and  
12 Installation, Blue Ridge Parkway.  
13
- 14 National Park Service (NPS), 2013. Blue Ridge Parkway. Virginia and North Carolina. Final General  
15 Management Plan. Environmental Impact Statement.  
16
- 17 National Park Service (NPS), 2015a. “Blue Ridge Parkway NC, VA”. *Bridges*.  
18 <https://www.nps.gov/blri/learn/historyculture/bridges.htm>.  
19
- 20 National Park Service (NPS), 2015b. *National Park Service NEPA Handbook*. Handbook, Washington  
21 D.C.: National Park Service.  
22 [https://www.nps.gov/subjects/nepa/upload/NPS\\_NEPAHandbook\\_Final\\_508.pdf](https://www.nps.gov/subjects/nepa/upload/NPS_NEPAHandbook_Final_508.pdf).  
23
- 24 National Park Service (NPS), 2016a. *Cultural Landscape Report*. <https://www.nps.gov/dscw/clar.htm>.  
25
- 26 National Park Service (NPS), 2016b. *Procedural Manual #77-1: Wetland Protection*.  
27 [https://www.nps.gov/policy/DOrders/Procedural\\_Manual\\_77-1\\_6-21-2016.pdf](https://www.nps.gov/policy/DOrders/Procedural_Manual_77-1_6-21-2016.pdf).  
28
- 29 National Park Service (NPS), U.S. Department of the Interior, 2016. Design Scoping Report. FTNP-  
30 BLRI 2A16. PMIS Number: 228076 for Blue Ridge Parkway, Alleghany County, North Carolina.  
31 Federal Highway Administration. Eastern Federal Lands Highway Division. Sterling, Virginia.  
32 April 2016.  
33
- 34 National Park Service (NPS), U.S. Department of the Interior and Federal Highway Administration,  
35 U.S. Department of Transportation. 2017. Draft Value Analysis (VA) and Choosing-by-  
36 Advantages (CBA) Study. Replacement of Blue Ridge Parkway Laurel Fork Bridge. Federal  
37 Project Number – NP – BLRI 2D17. Blue Ridge Parkway, North Carolina. December 2017.  
38
- 39 National Park Service (NPS), 2018a. “Night Skies”. <https://www.nps.gov/subjects/nightskies/index.htm>.  
40
- 41 National Park Service (NPS) Stats, 2018b. National Park Service Visitor Use Statistics. Blue Ridge  
42 Parkway Reports. <https://irma.nps.gov/Stats/Reports/Park/BLRI>. Accessed September 7, 2018.  
43
- 44 North Carolina Department of Environmental Quality (NCDEQ), 2018a. “2016 Final 303(d) List”.  
45
- 46 North Carolina Department of Environmental Quality (NCDEQ). 2018b. Interactive Map of North  
47 Carolina’s Geology and Natural Resources. [https://deq.nc.gov/about/divisions/water-  
48 resources/water-resources-science-data](https://deq.nc.gov/about/divisions/water-resources/water-resources-science-data). Accessed September 24, 2018.

1 North Carolina Department of Transportation (NCDOT), 2012. Invasive Exotic Plants of North  
2 Carolina.

3

4 North Carolina Department of Water Resources (NCDWR), 2014a. “2014 NC Water Quality  
5 Assessment for 305 (b)”. [http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=140d4802-  
6 dc9e-4e4a-8db2-1ec3a336ceca&groupId=38364](http://portal.ncdenr.org/c/document_library/get_file?uuid=140d4802-dc9e-4e4a-8db2-1ec3a336ceca&groupId=38364).

7

8 North Carolina Division of Water Resources (NCDWR), 2013. Standard Operating Procedure.  
9 Biological Monitoring. Stream Fish Community Assessment Program.  
10 <https://files.nc.gov/ncdeq/document-library/IBI%20Methods.2013.Final.pdf>

11

12 North Carolina Division of Water Resources (NCDWR), 2014b. “2014 Integrated Report”.  
13 <https://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=dcb44280272e4ac49>.

14

15 North Carolina Division of Water Resources (NCDWR), 2013. Standard Operating Procedures for the  
16 Collection and Analysis of Benthic Macroinvertebrates.  
17 [https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/BAU/NCDWRMacro  
18 oinvertebrate-SOP-February%202016\\_final.pdf](https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/BAU/NCDWRMacroinvertebrate-SOP-February%202016_final.pdf)

19

20 North Carolina General Assembly (NCGA), 1973. *Article 4 – Sedimentation Pollution Control Act of*  
21 *1973. G.S. 113A-57, Mandatory Standards for land-disturbing activity.*  
22 [https://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter\\_113A/Article\\_4.  
23 html](https://www.ncleg.net/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_113A/Article_4.html).

24

25 North Carolina Natural Heritage Program (NCNHP), 2011. Office of Conservation Planning and  
26 Community Affairs. An Inventory of the Significant Natural Areas of Alleghany County, North  
27 Carolina.

28

29 North Carolina Natural Heritage Program (NCNHP), 2012. Department of Environment and Natural  
30 Resources. *Guide to the Natural Communities of North Carolina*. Fourth Approximation.  
31 Michael P. Schafale.

32

33 North Carolina Natural Heritage Program (NCNHP), 2018. *Species/Community Search*. Updated on  
34 July 20, 2018 with 2018-07 data set. <https://www.ncnhp.org/data/species-community-search>.  
35 Accessed September 24, 2018.

36

37 North Carolina State University (NCSU), 2018. Plant Extension.  
38 <https://plants.ces.ncsu.edu/plants/category/trees/> Accessed July 16, 2018.

39

40 North Carolina Wildlife Resources Commission (NCWRC), 2018. “Public Mountain Trout Waters  
41 Search”. [https://www.ncwildlife.org/Fishing/Where-to-Fish/Public-Mountain-Trout-Waters-  
42 Search](https://www.ncwildlife.org/Fishing/Where-to-Fish/Public-Mountain-Trout-Waters-Search). Accessed September 24, 2018.

43

44 U.S. Army Corps of Engineers (USACE), 2012. Regional Supplement to the Corps of Engineers Wetland  
45 Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0, ed. J. F. Berkowitz,  
46 J.S. Wakeley, R.W. Lichvar, C. V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army  
47 Engineer Research and Development Center.

- 1 U.S. Department of Transportation (USDOT) & Federal Highway Administration (FHWA), 2011.  
2 *Alkali-Silica Reactivity Field Identification Handbook*.  
3 <https://www.fhwa.dot.gov/pavement/concrete/asr/pubs/hif12022.pdf>.  
4
- 5 U.S. Fish and Wildlife Service (USFWS), 2018a. *Endangered Species, Threatened Species, Federal Species*  
6 *of Concern, and Candidate Species, Alleghany County, North Carolina*  
7 <https://www.fws.gov/raleigh/species/cntylist/alleghany.html>. Accessed September 24, 2018.  
8
- 9 U.S. Fish and Wildlife Service (USFWS), 2018b. *Endangered Species, Threatened Species, Federal Species*  
10 *of Concern, and Candidate Species, Ashe County, North Carolina*.  
11 [https://www.fws.gov/raleigh/species/cntylist/nc\\_counties.html](https://www.fws.gov/raleigh/species/cntylist/nc_counties.html). Accessed September 24, 2018.  
12
- 13 Weakley, A.S., (2015). *Flore of the Southern and Mid-Atlantic States. University of North Carolina*  
14 *Herbarium (NCU), North Carolina Botanical Garden, University of North Carolina Chapel Hill*.  
15 [http://www.herbarium.unc.edu/FloraArchives/WeakleyFlora\\_2015-05-29.pdf](http://www.herbarium.unc.edu/FloraArchives/WeakleyFlora_2015-05-29.pdf).

**APPENDIX A – APPLICABLE EXECUTIVE ORDERS, REGULATIONS, &  
POLICIES**

<b>Resource</b>	<b>Relevant Laws and Regulations</b>
Air Quality	Clean Air Act NPS Organic Act
Cultural, Historic, and Archeological Resources	National Historic Preservation Act Archeological Resources Protection Act Director’s Order #12 Director’s Order #28 NPS Organic Act
Floodplains	Executive Order 11988 Director’s Order #77-2
Hydrology and Water Quality	Clean Water Act Executive Order 12088 Director’s Order #77 NC Sediment Pollution Control Act
Noise	Director’s Order #47 Noise Control Act
Park Operations	NPS Organic Act
Socioeconomics	Director’s Orders #2 and #12
Soils	Farmland Protection Policy Act Memorandum on Prime and Unique Agricultural Lands and NEPA (CEQ 1980)
Rare, Threatened, Endangered, and Special Status Species	Endangered Species Act NPS Organic Act Director’s Order #77
Vegetation	Executive Order 13112 Director’s Order #77
Visitor Use	NPS Organic Act Director’s Order #12
Visual Resources	NPS Organic Act
Wetlands	Executive Order 11990 Clean Water Act Director’s Order #77-1

**APPENDIX B – AGENCY COORDINATION LETTERS & RESPONSES**

---

## APPENDIX C – MEMORANDUM OF AGREEMENT

---